NEW CURRICULA

Advanced Training in Clinical Pharmacology

Curriculum standards

RACP Specialists. Together

About this document

The new Advanced Training in Clinical Pharmacology curriculum consists of curriculum standards and learning, teaching, and assessment (LTA) programs.

This document outlines the curriculum standards for Advanced Training in Clinical Pharmacology for trainees and supervisors. The curriculum standards should be used in conjunction with the Advanced Training in Clinical Pharmacology LTA programs.

Contents

Program overview

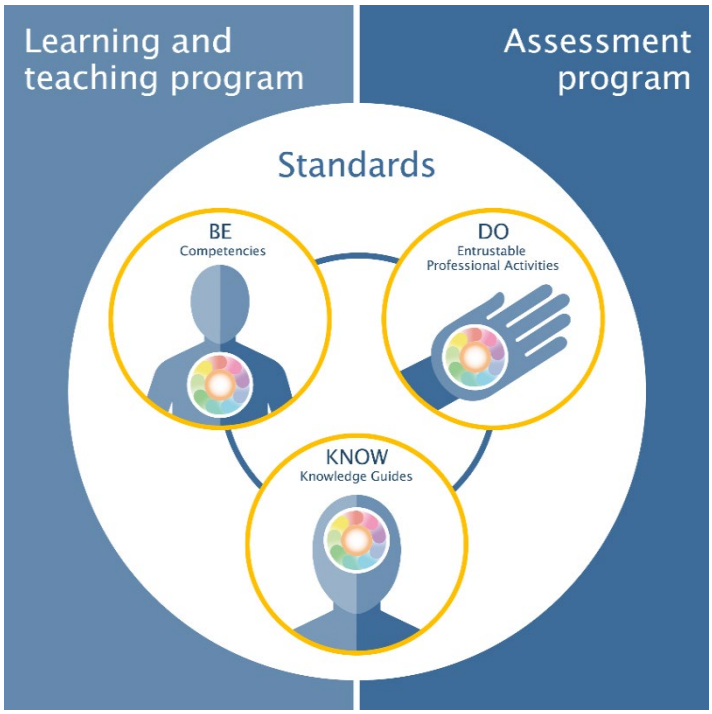
Purpose of Advanced Training

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

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

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

RACP curriculum model



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

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

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

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

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

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

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

Professional Practice Framework

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

Learning, teaching, and assessment (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.

Clinical Pharmacology specialty overview

Clinical pharmacology is a diverse and exciting field at the cutting edge of prescribing, research, drug development, and therapeutic advancement. A career in clinical pharmacology presents a range of non-clinical and clinical opportunities, including dual specialisation.

Clinical pharmacologists play a leading role in improving patient outcomes by optimising medicine use. Clinical pharmacologists have extensive skills in:

- **managing patients with complex prescribing needs,** including polypharmacy, adherence, and multimorbidity. They prevent and manage adverse drug reactions, and identify and reduce medication errors.
- **advancing and refining the use of medicines and other therapeutics,** including designing and leading safe and effective clinical trials. They work to discover new medicines, choose the best dosing regime, and explore new uses for existing medicines.
- **medicines policy and management,** playing a leading role in drug regulation and the development and implementation of prescribing guidelines and medicines optimisation policy. They provide leadership on the safe and optimal use of medicines within the health service at local, regional, and national levels, while also addressing issues related to drug safety and clinical toxicology.
- **clinical expertise relevant to all specialties,** aiming to improve prescribing practices and ensure prescribing decisions are evidence-based. They practice in a wide range of settings, including clinical practice, academia, research, industry, and drug regulation, considering factors like drug safety and toxicology.
- **education and training** across the whole workforce in relation to all aspects of the safe, effective, and economic use of medicines. They provide academic leadership in teaching and research in universities, hospitals, government departments, and industry. Clinical pharmacologists promote the undertaking of drug utilisation evaluations in hospitals and community practice, and provide important input into therapeutic drug monitoring use and interpretation.
- **application of a scholarly approach,** conducting and applying research and evidence in their daily practice to advance medicines and therapeutics and contribute to a growing global knowledge base. There are often opportunities within non-clinical practice to travel and collaborate with colleagues internationally.
- **working as an integral part of multidisciplinary teams.** Clinical pharmacologists have a collaborative approach which is focused on building relationships and improving quality control around the use of medicines.

Clinical Pharmacology learning goals

The curriculum standards are summarised as 14 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. Longitudinal care 8. Communication with patients 9. Prescribing 10. Investigations 11. Clinic management
KNOW Knowledge guides	12. Foundations of clinical pharmacology 13. Clinical pharmacology by system 14. Prescribing

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 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, families, whānau, or carers[1], and in collaboration with the healthcare team.

[1] References to patients in the remainder of this document may include their families, whānau, 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: Use a range of effective and appropriate verbal, nonverbal, written and other 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.[2]

They do this by engaging with and critically appraising research, and applying it in policy and practice to improve the health outcomes of patients and populations.

Evidence-based practice: Critically analyse relevant literature and refer to evidence-based clinical guidelines, and apply these in daily practice.

Research: Apply research methodology to add to the body of medical knowledge and improve practice and health outcomes.

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

Cultural safety

Professional standard: Physicians engage in iterative and critical self-reflection of their own cultural identity, power, biases, prejudices and practising behaviours. Together with the requirement of understanding the cultural rights of the community they serve; this brings awareness and accountability for the impact of the physician's own culture on decision-making and healthcare 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.

[3] The RACP has adopted the Medical Council of New Zealand's definition of cultural safety (below):
Cultural safety can be defined as[1].

- 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 healthcare professionals and healthcare organisations engage in ongoing self-reflection and self-awareness and hold themselves accountable for providing culturally safe care, as defined by the patient and their communities.

1. 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 wellbeing 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 patient 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 principles 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 health 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 scope of practice 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 healthcare 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.

Sustainability: Manage the use of healthcare resources responsibly in everyday practice.

Entrustable Professional Activities

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

#	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	Longitudinal care	Manage and coordinate the longitudinal care of patients with chronic illness, disability, and/or long-term health issues
8	Communication with patients	Discuss diagnoses, problems and management plans with patients
9	Prescribing	Prescribe therapies tailored to patients' needs and conditions
10	Investigations	Select, organise, and interpret investigations
11	Clinic management	Manage an outpatient clinic

Learning goal 2: Team leadership

Theme	Team leadership	
Title	**Lead a team of health professionals**	
Description	This activity requires the ability to: • prioritise workload • manage multiple concurrent tasks • articulate individual responsibilities, expertise, and accountability of team members • understand the range of team members' skills, expertise, and roles • acquire and apply leadership techniques in daily practice • collaborate with and motivate team members • encourage and adopt insights from team members • act as a role model.	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• synthesise information with other disciplines to develop optimal, goal-centred plans for patients[4] • use evidence-based care to meet the needs of patients 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 healthcare 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 • work with patients, families, carers, and other health professionals to resolve conflict that may arise when planning and aligning goals	• communicate adequately with colleagues • communicate adequately with patients, families, carers, and/or the public • respect the roles of team members

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

	• demonstrate rapport with people at all levels by tailoring messages to different stakeholders	
Quality and safety	• identify opportunities to improve care by participating in surveillance and monitoring of adverse events and 'near misses' • identify activities within systems to reduce errors, improve patient and population safety, and implement cost-effective change • 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 interdisciplinary collaboration to provide effective health services and operational 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 skills and knowledge, and engage in self-directed learning • maintain current knowledge of new technologies, health care priorities, and changes of patients' expectations • teach competently by imparting professional knowledge • manage and monitor learner progress, providing regular assessment and feedback	• accept feedback constructively, and change behaviour in response • recognise the limits of personal expertise, and involve other health professionals as needed • demonstrate basic skills in facilitating colleagues' learning
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	• 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

	• acknowledge personal conflicts of interest and unconscious bias • act collaboratively to resolve behavioural incidents and conflicts such as harassment and bullying	• 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 practice	• understand the range of personal and other team members' skills, expertise, and roles • acknowledge and respect the contribution of all health professionals involved in patients' 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 healthcare 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	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity
	The trainee will:	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 learners to consider the rationale and appropriateness of investigation and management options	• teach learners using basic knowledge and skills
Communication	• 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], such as younger or older people, and different populations	• demonstrate accessible, supportive, and compassionate behaviour

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

	• support learners to deliver clear, concise, and relevant information in both verbal and written communication • listen and convey information clearly and considerately	
Quality and safety	• support learners to deliver quality care while maintaining their own wellbeing • apply lessons learnt about patient safety by identifying and discussing risks with learners • assess learners' competence, and provide timely feedback to minimise risks to care • maintain the safety of patients and organisations involved with education, and appropriately identify and action concerns	• observe learners to reduce risks and improve health outcomes
Teaching and learning	• demonstrate knowledge of the principles, processes, and skills of supervision • provide direct guidance to learners in day-to-day work • work with learners to identify professional development and learning opportunities based on their individual learning needs • offer feedback and role modelling • participate in teaching and supervision 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 • apply a standardised approach to teaching, assessment, and feedback without considering individual learners' needs • implement teaching and learning activities that are misaligned to learning goals • adopt a teaching style that discourages learner self-directedness
Research	• clarify junior colleagues' research project goals and requirements, and provide feedback regarding the merits or challenges of proposed research	• guide learners with respect to the choice of research projects • ensure that the research projects planned are feasible and of suitable standards

	• 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 • 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 safety • encourage learners to consider culturally appropriate care of Aboriginal and Torres Strait Islander peoples and Māori into patients' management • consider cultural, ethical, and religious values and beliefs in teaching and learning	• function effectively and respectfully when working 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 • 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 • 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

	• help shape organisational culture to prioritise quality and work safety through openness, honesty, shared learning, and continued improvement	
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	• incompletely 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 and report actual and potential ('near miss') errors • conduct and evaluate 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[6] and enhance health care • monitor one's own practice and develop individual improvement plans.	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• use health data to identify opportunities for improving medication use and prescribing • regularly review patients' or local or population health data to identify opportunities for improvement in delivering appropriate care • evaluate environmental and lifestyle health risks, and advocate for healthy lifestyle choices • use standardised protocols to adhere to best practice and prevent the occurrence of medication errors and related harms • regularly monitor personal professional performance	• 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	• support patients to have access to, and use, easy-to-understand, high-quality information about medicines and health care • support patients to share decision making about their own health care, to the extent they choose • assist patients' access to their health information, as well as complaint and feedback systems	• demonstrate awareness of the evidence for consumer engagement and its contribution to quality improvement in health care • apply knowledge of how health literacy might affect the way patients or populations gain access to, understand, and use health information

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

	• discuss with patients any safety and quality concerns they have relating to their care • implement the organisation's open disclosure policy	
Quality and safety	• demonstrate safety skills, including infection control, adverse event reporting, and effective clinical handover • participate in organisational quality and safety activities, including morbidity and mortality reviews, clinical incident reviews, root cause analyses, and corrective action preventative action plans • participate in systems for surveillance and monitoring of adverse events and 'near misses', including reporting such events • ensure that identified opportunities for improvement are raised and reported appropriately • use clinical audits and registries of data on patients' experiences and outcomes, learnings from incidents, and complaints to improve care • explain health data sources and the influence of bias	• demonstrate understanding of a systematic approach to improving the quality and safety of health care
Teaching and learning	• translate quality improvement approaches and methods into practice • participate in professional training in quality and safety to ensure a contemporary approach to safety system strategies • supervise and manage the performance of junior colleagues in the delivery of high-quality, safe care, and identify strategies to address underperformance • resolve conflicts within a team • teach clinical pharmacology at both undergraduate and postgraduate level • prepare, deliver, and evaluate teaching in a variety of different modes • design a structured framework for virtual teaching and remote supervision techniques that align with the growing reliance on digital communication tools in the education sector	• 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	• prepare a research protocol for approval by a human research ethics committee • critically review clinical trial or research protocols against national standards • design, conduct, and complete a research study, including ethics application, full report, and/or publication • complete a peer review of a manuscript submitted for publication	• 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 • prepare an ethics application for a drug trial
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 • contribute to developing an organisational culture that enables and prioritises patients' safety and quality	• comply with professional regulatory requirements and codes of conduct
Judgement and decision making	• use decision-making support tools, such as guidelines, protocols, pathways, and reminders • analyse and evaluate current care processes to improve care	• access information and advice from other health practitioners to identify, evaluate, and improve patients' care management
Leadership, management, and teamwork	• formulate and implement quality improvement strategies as a collaborative effort, involving all key health professionals • support multidisciplinary team activities to lower patients' risk of harm, and promote interdisciplinary programs of education • actively involve clinical pharmacists in the medication-use process	• demonstrate attitudes of respect and cooperation among members of different professional teams • partner with clinicians and managers to ensure patients receive appropriate care and information on their care
Health policy, systems, and advocacy	• participate in all aspects of the development, implementation, evaluation, and monitoring of governance processes • participate regularly in multidisciplinary meetings where quality and safety issues are standing agenda items, and where innovative ideas and projects for improving care are actively encouraged • measure, analyse, and report a set of specialty-specific clinical indicators, and a set of generic safety indicators	• maintain a dialogue with service managers about issues that affect patients' care • contribute to relevant organisational policies and procedures • help shape an organisational culture that prioritises safety and quality through openness, honesty, learning, and quality improvement • participate in the development or maintenance of paediatric formularies

	• contribute to the working of a drug committee • work with patients to promote shared decision making, the patient voice, and inclusivity in relation to research and quality improvement projects • take part in the design and implementation of organisational systems for: » clinical education and training » defining the scope of clinical practice » performance monitoring and management » safety and quality education and training » supporting the development of local drug policy

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[7] • obtain patient histories, including comprehensive medication histories • examine patients • synthesise findings to develop provisional and differential diagnoses • discuss findings with patients • generate management plans • present findings to other health professionals.	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• elicit accurate, organised, and problem-focused medical histories, considering risk factors, including medication adherence and physical and psychosocial components • perform full physical examinations to establish the nature and extent of problems, including toxicities and overdoses • demonstrate initial assessment and management of suicide risk, mental capacity, and mental health status in poisoned patients • synthesise and interpret findings from histories, examinations, and investigations, integrate data from wearables, and devise the most likely diagnoses for clinical management • assess the severity of problems, 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, including substance use or dependence	• take patient-centred histories, considering psychosocial factors • perform accurate physical examinations • recognise and correctly interpret abnormal findings • synthesise pertinent information to direct clinical encounters and diagnostic categories • develop appropriate management plans

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

	• produce expert clinical / scientific reports	
Communication	• communicate openly, listen, and take patients' concerns seriously, giving them adequate opportunity to ask questions • provide information to patients to enable them to make fully informed decisions from various diagnostic, therapeutic, and management options • communicate clearly, effectively, respectfully, and promptly with other health professionals involved in patients' care • work in partnership with patients to construct medicine optimisation plans to address complex prescribing needs • communicate complex prescribing issues and proposed management choices to patients and their healthcare providers	• anticipate, read, and respond to verbal and nonverbal cues • demonstrate active listening skills • communicate patients' situations to colleagues, including senior clinicians
Quality and safety	• demonstrate safety skills, including infection control and pharmacovigilance activities, including adverse event reporting and effective clinical handover • recognise and effectively deal with aggressive and violent patient behaviours through appropriate training • obtain informed consent before undertaking any investigation or providing treatment (except in an emergency) • ensure patients are informed of the material risks associated with any part of proposed management plans	• take precaution against assaults from confused or agitated patients, ensuring 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 upon and self-evaluate professional development • obtain informed consent before involving patients in teaching activities • turn clinical activities into an opportunity to teach, appropriate to the setting • provide poisons advice for common poisons exposures	• deliver teaching considering learners' level of training

	• communicate and teach pharmacokinetic principles to other staff, and apply to specific patients • participate in ongoing education about new drugs on the market, updates in pharmacotherapy guidelines, and emerging evidence in drug therapy • use resources for learning about global differences in drug availability and regulatory considerations	
Research	• search for, find, compile, analyse, interpret, and evaluate information relevant to the research subject • appropriately contribute to drug evaluation committees • write submissions to ethics committees • stay informed and up to date on advances in research and best practice clinical care • participate in conduct of randomised control trials	• refer to guidelines and medical literature to assist in clinical assessments when required • demonstrate an understanding of the limitations of evidence and the challenges of applying research in daily practice • explain the safety requirements of research subjects • retrieve and interpret the literature on more complex issues
Cultural safety	• use plain-language patient education materials, and demonstrate cultural and linguistic sensitivity • demonstrate effective and culturally safe communication and care for Aboriginal and Torres Strait Islander peoples and Māori, and members of other cultural groups • use a professional interpreter, health advocate, or family or community member to assist in communication with patients, and understand the potential limitations of each • acknowledge patients' beliefs and values, and how these might impact on health	• 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, involving a proxy decision maker appropriately	• demonstrate professional conduct, honesty, and integrity • consider patients' decision-making capacity • identify patients' preferences regarding management and the role of families in decision making • not advance personal interest or professional agendas at the expense of patient or social welfare

Judgement and decision making	• apply knowledge and experience to identify patients' problems, making logical, rational decisions, and acting 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	• demonstrate clinical reasoning by gathering focused information relevant to patients' care • recognise personal limitations and seek help in an appropriate way when required
Leadership, management, and teamwork	• work effectively as a member of multidisciplinary teams to achieve the best health outcomes for patients, including with laboratory scientists • demonstrate awareness of colleagues in difficulty, and work within the appropriate structural systems to support them while maintaining patient safety	• share relevant information with members of the healthcare team
Health policy, systems, and advocacy	• participate in health promotion, disease prevention and control, screening, and reporting notifiable diseases • aim to achieve optimal cost-effective patient care to allow maximum benefit from the available resources • aim to incorporate environmentally sustainable service delivery • advocate for patients when there are escalating concerns for their deteriorating condition	• identify and navigate components of the healthcare system relevant to patients' care • identify and access relevant community resources to support patients' 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 transitions of patients'[8] care to ensure the optimal continuation of care between providers • identify the appropriate care providers and other stakeholders with whom to share patient information • exchange pertinent, contextually appropriate, and relevant patient and medication-related information • perform this activity in multiple settings, appropriate to clinical pharmacology, including ambulatory, critical care, inpatient, and laboratory 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 The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• facilitate an optimal transition of care for patients between settings with reference to pharmacotherapy and therapeutics • identify and manage key risks for patients during transition, especially involving high-risk medicines • anticipate possible changes in patients' conditions and medication regimens, and provide recommendations on how to manage them	• understand the details of patients' conditions, illness severity, medication management, and potential emerging issues, with appropriate actions • provide accurate summaries of patients' information and medications with accurate identification of problems or potential therapeutic misadventure during transitions of care
Communication	• write relevant and detailed medical record entries, including clinical assessments, medication reconciliation, 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 about transitions 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 effective transitions between settings and continuity and quality of care

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

Quality and safety	• identify patients at risk of adverse events at transition of care, and mitigate this risk • use electronic tools (where available) to securely store and transfer patient and medication-related information • use consent processes, including written consent if required, for the release and exchange of information • explain the medicolegal context of written communications	• ensure that handover is complete, or work to mitigate risks if incomplete • ensure all outstanding results or procedures are followed up by receiving units and clinicians • keep patients' information secure, adhering 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 handover, as necessary
Cultural safety	• communicate with careful consideration to health literacy, language barriers, and culture regarding patients' preferences, and whether they are realistic and possible, respecting patient choices • examine the variations in medication management and the resulting outcomes among Aboriginal and Torres Strait Islander peoples and Māori, and members of other cultural groups • recognise the timing, location, privacy, and appropriateness of sharing information with patients and their families or carers	• include relevant information regarding patients' cultural or ethnic background in handovers, and whether an interpreter is required
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, such as genetic information and 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 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 consider and prioritise 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 • 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 the opportunity for patients' engagement and participation when appropriate	• recognise factors that impact the transfer of care, and help subsequent health professionals understand the issues to continue care • work to overcome the potential barriers to continuity of care, appreciating the role of handover in overcoming these barriers
Health policy, systems, and advocacy	• contribute to processes for managing risks, and identify strategies for improvement in transitions of care, particularly in relation to medication regimens • engage in organisational processes to improve transitions of care, such as oversight of governance, auditing, and quality improvement	• factor transport issues and costs to patients into arrangements for transferring patients to other settings

Learning goal 7: Longitudinal care

Theme	Longitudinal care	
Title	**Manage and coordinate the longitudinal care of patients with chronic illness, disability, and/or long-term health issues**	
Description	This activity requires the ability to: • develop management plans and goals in consultation with patients[9] • manage chronic and advanced conditions, complications, disabilities, and comorbidities • collaborate with other care providers • ensure continuity of care • facilitate patients' self-management and self-monitoring • engage with the broader health policy context.	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• regularly assess and review care plans for patients with chronic comorbidities, multimorbidity, and disabilities, based on short- and long-term clinical and quality of life goals • provide documentation on patients' presentation, management, and progress, including key points of diagnosis and decision making, to inform coordination of care • ensure patients contribute to their needs assessments and care planning • monitor treatment outcomes, effectiveness, and adverse events • identify the use of tools used by allied health to assess function in care	• assess patients' knowledge, beliefs, concerns, and daily behaviours related to their chronic condition and/or disability and its management • contribute to medical record entries on histories, examinations, and management plans in a way that is accurate and sufficient as a member of multidisciplinary teams
Communication	• encourage patients' self-management through education to take greater responsibility for their care, and support problem solving • encourage patients' access to self-monitoring devices and assistive technologies	• provide healthy lifestyle advice and information to patients on the importance of self-management • work in partnership with patients, and motivate them to comply with advice

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

	• communicate with multidisciplinary team members, including remotely, and involve patients in that dialogue	
Quality and safety	• use innovative models of chronic disease care, using telehealth and digitally integrated support services • review medicine use, and ensure patients understand safe medication administration to prevent errors • support patients' self-management by balancing between minimising risk and helping them become more independent • participate in quality improvement processes impacting on patients' abilities to undertake normal activities of daily living • stay informed and up to date on advances in research and best practice clinical care	• participate in continuous quality improvement processes and clinical audits on chronic disease management • identify activities that may improve patients' quality of life
Teaching and learning	• contribute to the development of clinical pathways for chronic diseases management, based on current clinical guidelines • educate patients to recognise and monitor their symptoms, and undertake strategies to assist their recovery	• use clinical practice guidelines for chronic diseases management
Research	• prepare reviews of literature on patients' encounters to present at journal club meetings • search for and critically appraise evidence to resolve clinical areas of uncertainty • recognise appropriate use of review articles	• search literature using problem / intervention / comparison / outcome (PICO) format
Cultural safety	• encourage patients from culturally and linguistically diverse backgrounds to join local networks to receive the support needed for long-term self-management • recognise that input may be required from cultural and diverse backgrounds, such as representatives in the community	• provide culturally safe chronic disease management
Ethics and professional behaviour	• share information about patients' health care, consistent with privacy laws and confidentiality and professional guidelines • use consent processes for the release and exchange of health information	• share information between relevant service providers • acknowledge and respect the contribution of health professionals involved in patients' care

	• assess patients' decision-making capacity, and appropriately identify and use alternative decision makers • identify that the least restrictive treatment options may require flexibility in medical management, and innovative solutions may be required	
Judgement and decision making	• implement stepped care pathways in the management of chronic diseases and disabilities • recognise patients' needs in terms of both internal resources and external support on long-term health care journeys • recognise that decision making is often team based, with input from multidisciplinary team members	• recognise personal limitations and seek help in an appropriate way when required
Leadership, management, and teamwork	• coordinate whole-person care for patients with multimorbidity through involvement in all stages of patients' care journeys • use a multidisciplinary approach across services to manage patients with chronic diseases and disabilities • develop collaborative relationships with patients and a range of health professionals	• participate in multidisciplinary care for patients with chronic diseases and disabilities, including organisational and community care, on a continuing basis, appropriate to patients' context
Health policy, systems, and advocacy	• use health screening for early intervention and chronic diseases management • assess alternative models of care delivery to patients with chronic diseases and disabilities • participate in government initiatives for chronic diseases management to reduce hospital admissions and improve patients' quality of life • help patients access initiatives and services for patients with chronic diseases and disabilities • review transitional care and community initiatives from non-governmental and government organisations to bridge hospital-to-home care	• demonstrate awareness of government initiatives and services available for patients with chronic diseases and disabilities, and display knowledge of how to access them

Learning goal 8: Communication with patients

Theme	Communication with patients	
Title	**Discuss diagnoses, problems, and management plans with patients**	
Description	This activity requires the ability to: • select suitable contexts, and include other team members • adopt a patient[10]-centred perspective, including adjusting for cognition, language, culture, and disabilities • select and use appropriate modalities and communication strategies • structure conversations intentionally • negotiate mutually agreed management plans • verify patients' understanding of information conveyed • develop and implement plans to ensure 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	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity
	The trainee will:	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 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 appropriate communication strategies and modalities for communication, such as emails, face-to-face, or phone calls • elicit patients' views, concerns, and preferences, promoting rapport	• select appropriate modes of communication • engage patients in discussions, avoiding the use of jargon • check patients' understanding of information

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

	• provide information to patients in plain language, avoiding jargon, acronyms, and complex medical terms • use a health care interpreter where appropriate • ensure sensory aids are used if available, such as amplifiers or hearing aids • encourage questions, and answer them to the degree that is desired by the patient • ask patients to share their thoughts or explain their management plans in their own words, to verify understanding • encourage shared decision making • convey information considerately and sensitively to patients, seeking clarification if unsure of how best to proceed • recognise the role of family or carers, and, when appropriate, encourage patients to involve their family or carers in decisions about their care	• adapt communication style in response to patients' age, developmental level, and cognitive, physical, cultural, socioeconomic, and situational factors • collaborate with patient liaison officers or patient advocates as required
Quality and safety	• discuss with patients their condition and the available management options, including potential benefits and harms • provide information to patients in a way they can understand before asking for their consent • consider capacity for decision making and consent • recognise and take precautions where patients may be vulnerable, such as issues of child protection, self-harm, or elder abuse • participate in processes to manage patients' complaints • stay informed and up to date on advances in research and best practice clinical care • explain limitations, lack of, and evolving evidence for certain conditions or treatments	• inform patients of the material risks associated with proposed management plans • treat information about patients as confidential
Teaching and learning	• obtain informed consent or other valid authority before involving patients in teaching, and recheck patients' consent periodically during the teaching session • manage patients' negative experiences resulting from teaching sessions	• obtain informed consent or other valid authority before involving patients in teaching

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 New Zealand • provide information to patients in a way they can understand before asking for their consent to participate in research or clinical trials • obtain an informed consent or other valid authority before involving patients in research and clinical trials	• refer to evidence-based clinical guidelines, and acknowledge the limitations of evidence • demonstrate an understanding of the limitations of the evidence and the challenges of applying research in daily practice
Cultural safety	• demonstrate effective and culturally safe communication with Aboriginal and Torres Strait Islander peoples and Māori • effectively communicate with members of other cultural groups by meeting patients' specific language, cultural, and communication needs • use qualified health care interpreters or cultural interpreters to help meet patients' communication needs • provide plain language and culturally appropriate written materials to patients when possible	• identify when to use interpreters • allow enough time for communication across linguistic and cultural barriers
Ethics and professional behaviour	• encourage and support patients to be well informed about their health, and to use information wisely when they make decisions • encourage and support patients in caring for themselves and managing their health • demonstrate respectful, professional relationships with patients • prioritise honesty, patients' 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 / expert opinions • manage relationships or potential conflicts of interest with external agencies or industry members	• 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 • exercise caution with the use of social media • demonstrate a caring attitude towards patients • respect patients, including protecting their rights to privacy and confidentiality (in and out of the workplace, such as on social media) • behave equitably towards all, irrespective of gender, age, culture, socioeconomic status, sexual preferences, beliefs, contribution to society, illness-related behaviours, or the illness itself

Leadership, management, and teamwork	• communicate effectively with team members involved in patients' care, and with patients • discuss medical assessments, treatment plans, and investigations with patients and primary care teams, working collaboratively with all • discuss patients' care needs with healthcare team members to align them with the appropriate resources • facilitate an environment in which all team members feel they can contribute and their opinion is valued • communicate accurately and succinctly, and motivate others on the healthcare team • evaluate controversial issues and make effective decisions that balance efficacy, safety, ethics, and cost	• answer questions from team members • summarise, clarify, and communicate responsibilities of healthcare team members • keep healthcare 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: Prescribing

Theme	Prescribing	
Title	**Prescribe therapies tailored to patients' needs and conditions**	
Description	This activity requires the ability to: • adhere to the principles of quality use of medicines, including scheduled medications • take and interpret medication histories • consider principles of personalised medicine approaches, such as concentration-guided dosing, in order to optimise medicine use • choose medicines based on an understanding of pharmacology, taking into consideration age, benefits, comorbidities, potential drug interactions, and risks • communicate with patients[11] about the benefits and risks of proposed therapies and appropriate non-drug therapies • provide instructions on medication administration effects and side effects • monitor medicines for efficacy and safety, and deprescribe where appropriate • collaborate with pharmacists.	
Behaviours		
Professional practice framework domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity
	The trainee will:	The trainee may:
Medical expertise	• identify the patients' disorders requiring pharmacotherapy • consider non-pharmacologic therapies • elicit comprehensive drug histories, including complementary and alternative medicines (CAM) • apply principles of pharmacodynamics and pharmacokinetics to drug dosing regimens • consider age, allergies, chronic disease status, frailty, lifestyle factors, organ impairments, patient preference, pharmacogenomics, potential drug interactions, and therapeutic objectives prior to prescribing new medications • use pharmacokinetic equations to derive basic pharmacokinetic parameters	• be aware of potential side effects and practical prescription points, such as medication compatibility and monitoring in response to therapies • select medicines for common conditions accurately, appropriately, and safely • demonstrate understanding of the benefits, contraindications, dosage, drug interactions, rationale, risks, and side effects • identify and manage adverse events • interpret laboratory data

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

	• review patients' drug concentrations, considering clinical condition, dosing history, and other factors that may affect interpretations of drug concentrations, such as age, lactation, pregnancy, and weight • predict the pharmacology and possible effects of a drug group from an understanding of its mechanism of action, including possible drug reactions • plan for follow-up and monitoring, and interpret the interpatient variability and factors contributing to it • consider critically reviewing medicines at each visit, deprescribing where appropriate, in discussion with patients and other relevant stakeholders • assess and introduce new medicines	
Communication	• discuss and evaluate the benefits, rationale, and risks of treatment options, making decisions in partnership with patients • write complete, clear, legible, and legal prescriptions in plain language, and include specific indications for the anticipated duration of therapy • educate patients about the expected outcomes, intended use, and potential side effects for each prescribed medication, addressing the common, rare, and serious side effects at the time of prescribing to improve patients' adherence to pharmacotherapy • describe how the medication should and should not be administered, including any important relationships to food, time of day, other medicines being taken, and advice to carers administering medication, where appropriate • ensure patients' understanding by repeating back pertinent information, such as when to return for monitoring and whether therapy continues after this single prescription • identify patients' concerns and expectations, and explain how medicines might affect their everyday lives	• discuss and explain the rationale for treatment options with patients • explain the benefits and burdens of therapies, considering patients' individual circumstances • write clearly legible scripts or charts using generic names of the required medication in full, including mg / kg / dose information and all legally required information • seek further advice from experienced clinicians or pharmacists when appropriate • use and advise about adherence aids

	• advise on off-label and unlicensed medication use • explore strategies to improve patient adherence, especially in chronic disease management	
Quality and safety	• review medicines regularly to reduce non-adherence, and monitor treatment effectiveness, possible side effects, and drug interactions, ceasing unnecessary medicines • perform complex medication reviews, and provide advice on judicious prescribing • review medication charts and make suggestions to reduce inappropriate polypharmacy, drug interactions, and adverse drug reactions • use electronic prescribing tools where available, and access electronic drug references to prevent errors caused by drug interactions and poor handwriting • prescribe new medicines only when they have been demonstrated to be safer or more effective at improving patient-oriented outcomes than existing medicines • participate in clinical audits to improve prescribing behaviour, including an approach to polypharmacy and prescribing cascade • evaluate and act upon drug prescription, dispensing, or administration errors • report suspected adverse events to the Therapeutic Goods Administration or Medsafe, and record it in patients' medical records • develop evidence-based prescribing guidelines • stay informed and up to date on advances in research and best practice clinical care	• check the dose before prescribing • monitor side effects and/or adverse drug reactions of prescribed medicines • identify medication errors and institute appropriate measures • use electronic prescribing systems safely • rationalise medicines to avoid polypharmacy
Teaching and learning	• use continuously updated software for computers and electronic medication management programs • use appropriate guidelines and evidence-based medicine resources to maintain a working knowledge of current medicines, keeping up to date on new medicines	• undertake continuing professional development to maintain currency with prescribing guidelines • reflect on prescribing, and seek feedback from a supervisor • promote safe prescribing for children • discuss prescribing errors • contribute to formulary maintenance

	• ensure patients understand management plans, including adherence issues	• deliver clinical pharmacology teaching materials to undergraduate and postgraduate students
Research	• critically appraise research material to ensure any new medicine improves patient-oriented outcomes more than older medicines, and not just more than placebo • use sources of independent information about medicines that provide accurate summaries of the available evidence on new medicines • analyse concentration-effect data • conduct and evaluate drug utilisation studies	• make therapeutic decisions according to the best evidence • recognise where evidence is limited, compromised, or subject to bias or conflict of interest
Cultural safety	• explore patients' understanding of and preferences for non-pharmacological and pharmacological management • offer patients effective choices based on their expectations of treatment, health beliefs, and cost • interpret and explain information to patients at the appropriate level of their health literacy • anticipate queries to help enhance the likelihood of medicines being taken as advised • ensure appropriate information is available at all steps of the medicine management pathway	• appreciate patients' cultural and religious backgrounds, attitudes, and beliefs, and how these might influence the acceptability of non-pharmacological and pharmacological management approaches
Ethics and professional behaviour	• provide information to patients about prescribed medicines and: » how to take the medicine » potential side effects » what the medicine does » what the medicine is for » when it should be stopped • make prescribing decisions based on good safety data when the benefits outweigh the risks involved • demonstrate understanding of the ethical implications of pharmaceutical industry-funded research and marketing • explain the legislative and regulatory controls for drugs of abuse • adjust prescribing practices to accommodate the growing occurrence of multimorbidity and polypharmacy in ageing populations	• consider the efficacy of medicines in treating illnesses, including the relative merits of different non-pharmacological and pharmacological approaches • follow regulatory and legal requirements and limitations regarding prescribing • follow organisational policies regarding pharmaceutical representative visits and drug marketing

Judgement and decision making	• use a systematic approach to select treatment options • use medicines safely, judiciously, and effectively to get the best possible results • choose suitable medicines only if medicines are considered necessary and will benefit patients • prescribe medicines appropriately to patients' clinical needs, in doses that meet their individual requirements, for a sufficient length of time, with the lowest cost to them • evaluate new medicines in relation to their possible efficacy and safety profile for individual patients • recognise the opposing viewpoints and pressures involved to market and subsidise new drugs • assess pharmacodynamic variation over time, and how this impacts clinical decisions	• recognise personal limitations and seek help in an appropriate way when required • consider the following factors for all medicines: » contraindications » cost to patients and the community » funding and regulatory considerations » generic versus brand medicines » interactions » risk-benefit analysis
Leadership, management, and teamwork	• interact with medical, pharmacy, and nursing staff to ensure safe and effective medicine use • act as a liaison between laboratory scientists and clinicians on matters related to drug concentrations • collaborate with laboratory scientists in matters relating to paediatric drug concentrations	• work collaboratively with pharmacists • participate in medication safety and morbidity and mortality meetings • participate in drug and therapeutics committees
Health policy, systems, and advocacy	• choose medicines in relation to comparative efficacy, safety, and cost-effectiveness against medicines already on the market • use electronic clinical decision support • support national initiatives around safe and effective use of medicines, including immunisation	• prescribe in accordance with the organisational policy • explain the structure of medicine regulatory and health technology assessment bodies

Learning goal 10: Investigations

Theme	Investigations	
Title	**Select, organise, and interpret investigations**	
Description	This activity requires the ability to: • select, plan, and use evidence-based clinically appropriate investigations • prioritise patients[12] receiving investigations (if there is a waiting list) • evaluate the anticipated value of investigations • work in partnership with patients to facilitate choices that are right for them • provide aftercare for patients (if needed) • interpret the results and outcomes of investigations • communicate the outcome of investigations to patients.	
Behaviours		
Professional practice framework Domain	**Ready to perform without supervision** Expected behaviours of a trainee who can routinely perform this activity without needing supervision The trainee will:	**Requires some supervision** Possible behaviours of a trainee who needs some supervision to perform this activity The trainee may:
Medical expertise	• choose evidence-based investigations, and frame them as an adjunct to comprehensive clinical assessments • assess patients' concerns, and determine the need for specific tests that are likely to result in overall benefit • develop plans for investigations, identifying their roles and timing • recognise and correctly interpret abnormal findings, considering patients' specific circumstances, and act accordingly	• provide rationale for investigations • understand the significance of abnormal test results, and act on these • consider patient factors and comorbidities • consider age-specific reference ranges
Communication	• explain to patients the potential benefits, burdens, costs, risks, and side effects of each option, including the option to have no investigations • use clear and simple language, and check that patients understand the terms used and agree to proceed with proposed investigations • identify patients' concerns and expectations, providing adequate explanations on the rationale for individual test ordering	• discuss the benefits, complications, indications, and risks of investigations with patients before ordering investigations • explain the results of investigations to patients • arrange investigations, providing accurate and informative referrals, and liaise with other services where appropriate

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

	• confirm whether patients have understood the information they have been given and whether they need more information before deciding • use written or visual material or other aids that are accurate and up to date to support discussions with patients • explain findings or possible outcomes of investigations to patients • provide information that patients may find distressing in a considerate way	
Quality and safety	• identify adverse outcomes that may result from proposed investigations, focusing on patients' individual situations • evaluate information presented regarding medicines • stay informed and up to date on advances in research and best practice clinical care	• consider safety aspects of investigations when planning them • seek help with interpretation of test results for less common tests or indications or unexpected results • evaluate laboratory performance via internal and external quality assurance activities, focusing on precision and accuracy
Teaching and learning	• use appropriate guidelines, evidence sources, and decision support tools • participate in clinical audits to improve test ordering strategies for diagnoses and screening	• undertake professional development to maintain currency with investigation guidelines • explain the interpretation of therapeutic drug monitoring
Research	• provide patients with relevant information if a proposed investigation is part of a research program • obtain written consent from patients if the investigation is part of a research program • source and apply principles of evidence-based medicine	• refer to evidence-based clinical guidelines • consult current research on investigations
Cultural safety	• recognise patients' views and preferences about any proposed investigations and the adverse outcomes they are most concerned about	• consider patients' cultural and religious backgrounds, attitudes, and beliefs, and how these might influence the acceptability of proposed investigations
Ethics and professional behaviour	• remain within the scope of the authority given by patients (with the exception of emergencies) • discuss with patients how decisions will be made once the investigation has started and the patient is not able to participate in decision making • respect patients' decisions to refuse investigations, even if their decisions may not be appropriate or evidence based	• identify appropriate proxy decision makers when required • choose not to investigate in situations where it is not appropriate for ethical reasons • practise within current ethical and professional frameworks • practise within own limits, and seek help when needed

	• advise patients there may be additional costs, which they may wish to clarify before proceeding • explain the expected benefits as well as the potential burdens and risks of any proposed investigations before obtaining informed consent or other valid authority • demonstrate awareness of complex issues related to genetic information obtained from investigations, and subsequent disclosure of such information	• involve patients in decision making regarding investigations, obtaining the appropriate informed consent, including financial consent, if necessary
Judgement and decision making	• evaluate the benefits, costs, and potential risks of each investigation in a clinical situation • adjust investigative paths depending on test results received • consider whether patients' conditions may get worse or better if no tests are selected • apply decision-making aids to choose suitable examinations, minimising excessive testing	• choose the most appropriate investigations for clinical scenarios in discussion with patients • recognise personal limitations and seek help in an appropriate way when required
Leadership, management, and teamwork	• consider the role other members of the healthcare team might play, and what other sources of information and support are available • ensure results are checked in a timely manner, taking responsibility for following up results	• demonstrate understanding of what parts of investigations are provided by different doctors or health professionals
Health policy, systems, and advocacy	• select and justify investigations regarding the pathological basis of disease, appropriateness, utility, safety, and cost effectiveness • consider resource utilisation through peer review of testing behaviours	• assess important drug information

Learning goal 11: Clinic management

Theme	Clinic management	
Title	**Manage an outpatient clinic**	
Description	This activity requires the ability to: • manage medical consultations, procedures, and treatments • manage clinic services • manage time and tasks • oversee quality improvement activities • communicate with patients[13] • liaise with other health professionals and team members • demonstrate problem-solving skills • responsibly use public resources • ensure competent use of technology, such as dictation and video consultation.	
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 patients' 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 • update documentation in a timeframe appropriate to the clinical situation of patients • liaise with stakeholders, and refer to other services where appropriate	• 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 collaboration with other services, such as community health centres and consumer organisations • link patients to specific community-based health programs and group education programs	• wherever practical, meet patients' specific language, health literacy, and communication needs • facilitate appropriate use of health care interpreter services and translated materials • ensure informed financial consent, and discuss relevant out-of-pocket costs

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

	• ensure accountability and adequate record keeping in line with billing requirements • avoid over-servicing and inappropriate investigations	
Quality and safety	• practise health care that maximises patient safety • adopt a systematic approach to the review and improvement of professional practice in the outpatient clinic setting • identify aspects of service provision that may be a risk to patients' safety • ensure that patients are informed about fees and charges, and seek financial consent • foster a culture of continuous quality improvement by proactively evaluating clinic services • ensure safe storage and retrieval of clinic data	• 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
Teaching and learning	• evaluate their own professional practice • demonstrate learning behaviour and skills in educating junior colleagues • contribute to the generation of knowledge • maintain professional continuing education standards	• recognise the limits of personal expertise, and involve other professionals as needed to contribute to patients' care • use information technology appropriately as a resource for modern medical practice
Research	• obtain informed consent or other valid authority before involving patients in research • inform patients about their rights, the purpose of the research, the procedures to be undergone, and the potential risks and benefits of participation before obtaining consent	• allow patients to make informed and voluntary decisions to participate in research
Cultural safety	• apply knowledge of the cultural needs of the community served, and how to shape service to those people • mitigate the influence of own culture and beliefs on interactions with patients and decision making • adapt practice to improve patient engagement and health outcomes • identify the need to use official interpreter services appropriately	• acknowledge the social, economic, cultural, and behavioural factors influencing health, both at individual and population levels
Ethics and professional behaviour	• identify and respect the boundaries that define professional and therapeutic relationships	• recognise the responsibility to protect and advance the health and wellbeing of individuals and communities

	• respect the roles and expertise of other health professionals • comply with the legal requirements of preparing and managing documentation • demonstrate awareness of financial and other conflicts of interest • ensure environmentally and financially sustainable service, responsive to community needs	• maintain the confidentiality of documentation, and store clinical notes appropriately • ensure that 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, where relevant, into clinical practice • work to achieve optimal and cost-effective patient care that allows maximum benefit from available resources	• recognise 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 time-efficient manner • work effectively as a member of multidisciplinary teams or other professional groups • document all important discussions with colleagues, multidisciplinary team members, and patients • review discharge summaries, notes, and other communications written by junior colleagues • support colleagues who raise concerns about patients' safety • develop a comprehensive understanding of crisis management and emergency response in a clinical environment	• 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 • identify funding programs from non-government organisations (NGOs) and government agencies that may benefit the clinic	• explain common population health screening and prevention approaches

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.

Trainees are not expected to be experts in all areas or have experience related to all items in these guides.

#	Title
12	Foundations of clinical pharmacology
13	Clinical pharmacology by system
14	Prescribing

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.

Drug dependence

- Classes of drugs involved, both legal and illegal
- Legislative and regulatory controls for drugs of abuse
- Principles of dependence, overdose, and tolerance, including receptor downregulation / internalisation

Drug discovery and development

- Drug development principles, such as:
  - considerations of using generic medicines, such as bioequivalence studies and drug patents
  - delivery and formulation
  - design and research, including lead generation and target identification and validation
  - efficacy, quality, and safety of new drug applications
  - opposing viewpoints and the pressures involved to market and subsidise new drugs
  - role of the national regulatory authorities
- Ethical aspects of drug-related research, including safety requirements of research subjects
- Preclinical and clinical development principles, such as:
  - International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use guidance
  - phases of drug trials
  - pre-clinical pharmacology and toxicology studies
  - principles to determine the maximum safe starting dose and dose-escalation in first-in-human clinical trials, such as:
    - minimal anticipated biological effect level (MABEL)
    - no observed adverse effects level (NOAEL)
    - pharmacologically active dose (PAD)
  - regulatory documents, such as:
    - Australian Public Assessment Reports (AusPAR)
    - European Public Assessment Reports (EPAR)
    - Food and Drug Administration (FDA)
  - significant regulatory milestones
- Principles of quality improvement methodology
- Principles of research methodology, such as:
  - awareness of more complex statistics, such as Mendelian randomisation (MR) and high-dimensional propensity score (hdPS) matching
  - basic biostatistics, such as power analysis and survival analysis
  - critical appraisal of a manuscript being submitted for publication
  - hypothesis development and testing
  - principles of good clinical research practice
  - review of ethics application against national statement
  - role of ethics, and ethics committees

Drug safety and toxicity

- Adverse drug reactions (ADRs) and pharmacovigilance, such as:
  - drug safety post-marketing
  - mechanisms of toxicity
  - monitoring adverse effects
- Drug-drug interactions and contraindications

Multimorbidity

- Clinical assessment, such as Charlson Comorbidity Index
- Clinical guidelines and medications used in the treatment of common comorbidities
- Conflicting therapeutic objectives
- Contribution to polypharmacy and drug interactions
- Definition
- Epidemiology
- Frailty as an effect modifier for medicines
- Pathophysiology

Pharmacodynamics and drug mechanisms

- Concentration-effect relationships, and factors that may alter these
- Drug-receptor interactions, such as:
  - agonists
  - antagonists
  - inverse agonists
  - partial agonists
- Enzyme activity in the presence of drugs
- Ion channel function across various systems
- Mechanisms of drug action, such as:
  - biologicals
  - gene therapy
  - receptor pharmacology
- Potency versus efficacy
- Role of transport proteins in pharmacokinetics
- Tolerance
- Use of biomarkers in drug therapy monitoring
- Variability in drug action

Pharmacoeconomics

- Economic implications of drug therapy, such as:
  - budget impact analyses
  - cost-effectiveness analyses
  - cost-minimisation analysis
  - cost-utility analysis

Pharmacoepidemiology

- Case control studies
- Cohort studies
- Cross-sectional studies
- Data sources, such as electronic medical records (EMRs) and Pharmaceutical Benefits Scheme (PBS)
- Repositories
- Use and effects of drugs in large numbers of people, and how it can inform public health decisions

Pharmacogenomics

- Databases available for pharmacogenomic research, including the Clinical Pharmacogenetics Implementation Consortium
- Genetic variability of drug response and metabolism, such as:
  - genetic variation of therapeutic targets
  - polymorphisms of key drug metabolising enzymes and transporters
  - race-associated pharmacogenetic variation
- Ontogeny of expression and function of key pharmacodynamic and pharmacokinetic genes
- Role in precision medicine
- Tailoring drug therapies to individual genetic profiles

Pharmacokinetics

- Basic pharmacokinetic equations
- Gene therapy principles, such as:
  - delivery vectors
  - expression kinetics
  - modalities
- Principles of pharmacokinetics, such as:
  - absorption, distribution, metabolism, and excretion (ADME)
  - area under a plasma drug concentration-time curve (AUC)
  - bioavailability and first-pass effect
  - clearance, including extraction ratio and total body clearance
  - drug behaviour in the body
  - drug metabolism and elimination
  - drug transport
  - first- and zero-order processes, such as saturation kinetics
  - half-life
  - nonlinear kinetics
  - plasma protein binding and free drug concentrations, considering the impact on parameters and effects
  - receptor-mediated drug disposition
  - volume of distribution
- Principles of pharmacodynamics and pharmacokinetics in special circumstances, such as:
  - extremes of size and age – development / senescence
  - hepatic disease
  - kidney failure
  - lactation
  - pharmacogenomics
- Receptor concepts

Substance use disorders

- Acute toxicity
- Demographics
- Mental health factors
- Social factors
- Tolerance
- Withdrawal and abstinence syndromes of common substances, such as:
  - antidepressants
  - cannabis
  - ethanol
  - gabapentinoids
  - nicotine
  - opioids
  - sedative hypnotics
  - stimulants

Toxicology care

- Anti-epileptic drugs
- Common poisonings, such as:
  - antibiotic
  - anticoagulant and antiplatelet
  - antihypertensive
  - antipsychotic
  - benzodiazepine
  - beta blocker
  - diuretic
  - glucose-lowering medicine
  - nonsteroidal anti-inflammatory drug (NSAIDs)
  - opioid
  - paracetamol

- salicylate
- steroid

- Impact of specific interventions on the outcome
- Novel psychoactive agents
- Principles of toxicodynamics and toxicokinetics
- Toxidromes, such as:
  - anticholinergic, including antimuscarinic
  - beta blocker
  - calcium channel blocker
  - cholinergic
  - opioid
  - sedative or hypnotic
  - serotonergic
  - sodium channel blocker
  - sympathomimetic

AIM

- Modelling and simulation, including physiologically based pharmacokinetic modelling (PBPK)
- Principles of pharmacodynamics and pharmacokinetics in geriatric, lactating, and pregnant patients

PCH

- Clinical and legislative issues relating to drugs of dependence / abuse, including adolescent substance misuse and neonatal abstinence syndromes
- Consent and other ethical issues specific to paediatric age groups
- Developmental changes in metabolic and kidney elimination pathways
- Mechanisms of action, modelling, and simulation in relation to paediatric age groups
- Paediatric drug trial principles, such as age-specific drug responses, and dosing and ethical challenges
- Pharmacodynamics and pharmacokinetics in:
  - adolescents
  - children
  - infants
  - intrauterine environment
  - lactation
  - neonates
  - preterm neonates

Drug development

- Efficacy, quality, and safety of new drug applications in the paediatric age
- Formulation development

Toxicology

- Antenatal and perinatal toxicity of maternal medications
- Clinically relevant human teratogens
- Drug exposure and toxicity through breastfeeding
- Principles of paediatric poisons exposures, such as intentional or accidental poisoning

INVESTIGATIONS, PROCEDURES, AND CLINICAL ASSESSMENT TOOLS

Advanced Trainees will know the scientific foundation of each investigation and procedure, including

- Analytical methodologies, such as:
  - immunoassays
  - liquid chromatography
  - mass spectrometry
- Assays, such as:
  - analysis of results
  - common methodology
  - performance principles
  - quality control

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[14], families, and carers, and be able to explain procedural risk and obtain informed consent where applicable.	• Model-dependent analyses, such as compartmental models • Model-independent analyses • Nonlinear mixed effect modelling • Simulation of new dosing regimens
	AIM No Adult Internal Medicine-specific content identified
	PCH • Assays in paediatric age groups
IMPORTANT SPECIFIC ISSUES Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis, management and outcomes.	• Impact on drug safety of digital health technologies, such as: » apps for medication management » digital therapeutics » dose modification using predictive software » electronic health records » electronic medication management and ordering » medical informatics and dashboards » telehealth for patient consultations • Multidisciplinary approach to care, such as when treating complex cancer patients • National and local guidelines for the quality use of medicines • Opportunities to stay informed and up to date on advances in research and best practice clinical care, such as participating in journal club to learn about new drugs and devices **Quality use of medicines** • Complementary and alternative medicine (CAM) benefits and limitations, including their side effects and interactions, and their prominence in the population • Drug information, such as: » gaps between lay, paramedical, and medical understanding of research methodology and evidence » levels of evidence » principles of evidence-based medicine » sources of drug information • Drug policy stakeholders, such as: » competing factions, including: ○ drug companies ○ government regulatory committees » drug committees » formularies

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

- Drug safety principles, such as:
  - » contribution of adverse drug reactions (ADRs) and drug error to morbidity and mortality
  - » difference between ADRs and adverse drug events (ADEs)
  - » importance of considering risks as well as benefits of drugs
  - » methods of evaluating and classifying ADEs, ADRs, and drug errors
  - » responsibility to contribute to the national database of ADRs
  - » role of post-marketing surveillance / pharmacovigilance / risk management plans
  - » sources of information on ADRs
- Impact of drugs on broader society, such as:
  - » climate health
  - » eco-pharmacovigilance
  - » globalisation and its impacts on the drug manufacturing chain, such as supply shortages
  - » sustainability
- Pharmaceutical, pharmacodynamic, and pharmacokinetic drug interactions as a cause of morbidity, mortality, and variability
- Principles behind compliance and adherence with medicines, and methods to these, including the benefits of compliance aids
- Principles of drug use evaluation, such as the audit loop, and the orphan drug designation
- Therapeutic drug concentration principles, such as:
  - » indications, limitations, and usefulness of therapeutic drug monitoring in patient management
  - » therapeutic ranges for commonly assayed medications

AIM

No Adult Internal Medicine-specific content identified

PCH

- Benefits, limitations, and extent of CAMs use in the paediatric age group
- Drug information, such as:
  - » appropriate methods for extrapolating adult data to children, and the limitations of these methods
  - » sources of drug information for the paediatric age group, and the limitations of this information
- Drug safety considerations, such as:
  - » detection of ADRs and ADEs in children
  - » errors in administration, dispensing, monitoring, and prescribing
- Principles of administration of medicines to children
- Role of neonatal / paediatric formularies in drug policies

KEY PRESENTATIONS AND CONDITIONS

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

Presentations
- Patients referred for care

Conditions – cardiovascular
- Arrhythmia
- Heart failure
- Hyperlipidemia
- Hypertension

Conditions – dermatological
- Cellulitis

Conditions – endocrine
- Diabetes:
  - type 1
  - type 2
- Thyroid disorders:
  - hyperthyroidism
  - hypothyroidism
  - thyroid nodules
  - thyroiditis

Conditions – gastrointestinal
- Acid peptic disease:
  - gastritis
  - gastroesophageal reflux disease (GERD)
  - peptic ulcer disease
- Motility disorders:
  - gastroparesis
  - irritable bowel syndrome (IBS)

Conditions – haematologic
- Anaemia

Conditions – kidney and urinary system
- Kidney failure:
  - acute injury (AKI)
  - chronic (CKD)

Conditions – musculoskeletal
- Arthritis:
  - osteoarthritis
  - rheumatoid arthritis
- Gout
- Musculoskeletal disorders:
  - fibromyalgia
  - osteoporosis
  - soft tissue injury

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, whānau, and/or carers.

Conditions – nervous system
- Epilepsy
- Neuropathies
- Stroke

Conditions – respiratory
- Asthma
- Chronic obstructive pulmonary disease (COPD)
- Pneumonia
- Pulmonary embolism

AIM

- Multimorbidity
- Psychiatric comorbidities

Geriatric syndromes
- Cognitive impairment
- Delirium
- Dementia
- Falls
- Fractures
- Incontinence
- Vertigo

PCH

No Paediatrics & Child Health-specific content identified

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
- Patients referred for care

Conditions – dermatological
- Cancer – skin
- Infection
- Psoriasis

Conditions – haematologic
- Cancer
- Clotting disorders
- Leukaemia
- Lymphoma

Conditions – immune
- Autoimmune disorders
- Deficiencies
- Systemic lupus erythematosus (SLE)

Conditions – kidney
- Glomerulonephritis
- Nephrotic syndrome

Conditions – neurological
- Multiple sclerosis

Conditions – reproductive system
- Infertility
- Menstrual disorders
- Prostate conditions
- Sexually transmitted infections

Less common conditions
- Genetic disorders, rare

AIM	No Adult Internal Medicine-specific content identified
PCH	• Neonatal abstinence syndromes

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 organ systems
- Clinical sciences, epidemiology, and pathophysiology of the conditions listed above in 'Key presentations and conditions'
- Clinical sciences of therapies used to treat cancer, such as:
  - » chemotherapy
  - » radiotherapy
- Impact of drugs on organ systems, such as:
  - » bone health, such as:
    - bisphosphonates
  - » kidney function
- Pharmacology and toxicology of medications to treat or manage the conditions listed above in 'Key presentations and conditions', such as:
  - » cardiovascular conditions:
    - angiotensin II receptor blockers (ARBs)
    - angiotensin-converting enzyme (ACE) inhibitors
    - anticoagulants
    - antiplatelets
    - calcium channel blockers
    - HMG CoA reductase
    - loop diuretics
    - thiazide and thiazide-like diuretics
  - » endocrine conditions:
    - antiresorptive
    - biguanides
    - carbimazole
    - dipeptidyl peptidase-4 (DPP4)
    - glucagon-like peptide 1 receptor agonist (GLP1RA)
    - insulin
    - sodium-glucose cotransporter 2 inhibitors (SGLT2i)
    - sulfonylureas
    - thyroxine
  - » gastrointestinal conditions:
    - aperients
    - proton pump inhibitors
  - » haematologic conditions:
    - antiplatelets
    - direct oral anticoagulants (DOACs)
    - heparins
    - low molecular weight heparin (LWMH)
    - warfarin
  - » immune conditions:
    - steroids
  - » nervous system conditions:
    - anaesthetics
    - analgesics
    - anti-epileptics
    - antipsychotics

- respiratory conditions:
  - bronchodilators
  - inhaled corticosteroids (ICS)
  - long-acting beta-agonists (LABA)
  - long-acting muscarinic antagonists (LAMA)
  - short-acting beta agonists (SABA)

AIM	No Adult Internal Medicine-specific content identified
PCH	No Paediatrics & Child Health-specific content identified

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.

Cardiovascular clinical assessment tools
- Cardiovascular disease (CVD) risk assessment tool
- New York Heart Association (NYHA) classification for heart failure

Cardiovascular investigations
- Angiogram – coronary
- Apolipoprotein B and lipoprotein (a)
- Blood pressure monitoring
- Blood tests
- CT / MRI – cardiac
- ECG
- Echocardiogram
- Electrophysiology study (EPS)
- Holter monitor
- Lipid profile
- Natriuretic peptides – NT-proBNP, PMN
- Troponin test
- Ultrasound – kidney, such as hypertension investigation
- Urine albumin-creatinine ratio (ACR)

Cardiovascular procedures
- Coronary artery bypass grafting (CABG)
- Percutaneous coronary intervention (PCI)
- Valve replacement or repair

Endocrine clinical assessment tools
- Body mass index (BMI)

Endocrine investigations
- Biopsy – fine needle aspiration
- Catecholamines and metanephrines
- Dexamethasone suppression test
- Diabetes autoantibodies
- Glucose:
  - continuous monitoring
  - fasting plasma
  - oral tolerance test
- Haemoglobin A1C (HbA1c)
- Hormonal investigation
- Renin-aldosterone ratio
- Thyroid function tests, such as:
  - free T3
  - free T4
  - thyroid stimulating hormone (TSH)
- Ultrasound – thyroid
- Urine ACR

Endocrine procedures
- Hormone replacement therapy
- Insulin therapy
- Thyroidectomy

Gastrointestinal clinical assessment tools
- Bristol Stool Scale
- Gastrointestinal Symptom Rating Scale (GSRS)

Gastrointestinal investigations
- Colonoscopy
- CT
- Endoscopy – upper
- Gastric emptying study
- *Helicobacter pylori* testing
- Oesophageal manometry
- pH monitoring
- Ultrasound – abdominal

Gastrointestinal procedures
- Biopsy – liver
- Endoscopic retrograde cholangiopancreatography (ERCP)
- Polypectomy

General
- Biomarkers test
- Radioimaging, such as:
  - CT
  - x-ray

Haematological clinical assessment tools
- Ferritin levels
- Haemoglobin levels
- International normalised ratio (INR)

Haematological investigations
- Biopsy – bone marrow
- Coagulation profile
- Complete blood count (CBC)
- Flow cytometry

Haematological procedures
- Blood transfusion
- Stem cell transplantation
- Therapeutic phlebotomy

Immune clinical assessment tools
- Allergy symptom score
- Clinical activity score (CAS) for autoimmune diseases

Immune investigations
- Allergy testing
- Autoantibody tests
- Human immunodeficiency virus (HIV) and immunodeficiency tests
- Immunoglobulin levels

Immune procedures
- Administration of biologic agents
- Immunotherapy
- Plasmapheresis

Kidney and urinary system clinical assessment tools
- Chronic kidney disease epidemiology collaboration (CKD-EPI) equation
- Urine ACR

Kidney and urinary system investigations

- Biopsy – kidney
- CT – urogram
- Glomerular filtration test
- Serum creatinine and estimated glomerular filtration rate (eGFR)
- Ultrasound – kidney
- Urinalysis

Kidney and urinary system procedures

- Dialysis:
  - haemodialysis
  - peritoneal
- Transplantation – kidney

Musculoskeletal clinical assessment tools

- Disease activity score in 28 joints (DAS28) for rheumatoid arthritis
- Range of motion (ROM) measurements
- Visual analogue scale (VAS) for pain

Musculoskeletal investigations

- Arthroscopy
- Biopsy
- Bone density scan (DEXA)
- MRI
- X-ray

Musculoskeletal procedures

- Fracture repair
- Surgery:
  - arthroscopic
  - joint replacement

Nervous system clinical assessment tools

- Glasgow Coma Scale (GCS)
- Mini-Mental State Examination (MMSE)
- Montreal Cognitive Assessment (MoCA)

Nervous system investigations

- CT – brain
- EEG
- Lumbar puncture
- MRI – brain

Nervous system procedures

- Carotid endarterectomy
- Deep brain stimulation (DBS)
- Neurosurgical interventions for tumours

Respiratory clinical assessment tools

- Asthma control test (ACT)
- Chronic obstructive pulmonary disease (COPD) assessment test (CAT)
- Pulmonary function tests

Respiratory investigations

- Bronchoscopy
- Chest tests:
  - CT
  - x-ray
- Spirometry

Respiratory procedures

- Biopsy – lung
- Mechanical ventilation for critical care
- Thoracentesis

	AIM	No Adult Internal Medicine-specific content identified
	PCH	No Paediatrics & Child Health-specific content identified

IMPORTANT SPECIFIC ISSUES Advanced Trainees will identify important specialty-specific issues and the impact of these on diagnosis and management and integrate these into care.		• Importance of informatics within health care, such as: » electronic health records » health roundtables » hospital-acquired complications • Management of oncological conditions with therapies, such as chemotherapy and radiotherapy • National and local guidelines for the quality use of medicines
	AIM	No Adult Internal Medicine-specific content identified
	PCH	No Paediatrics & Child Health-specific content identified

CLINICAL SCIENCES

Advanced Trainees will describe the principles of the foundational sciences.

- Clinical trials principles, such as:
  - advantages and limitations of clinical trial designs:
    - adaptive
    - basket
    - case series
    - crossover
    - observational
    - parallel
    - platform
    - randomised
    - umbrella
  - dosing strategies
  - ethical, legal, and regulatory requirements for approval, registration, and reporting
  - outcome measures
  - phases of clinical trials
  - relevant standards and guidelines, such as:
    - common terminology criteria for adverse events (CTCAE)
    - International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use guidance, including good clinical practice (GCP) guidelines
  - sample size estimation and power calculation
  - scope and limitations
  - selection of participants and eligibility criteria
- Digital therapeutics, such as:
  - applications
  - artificial intelligence (AI)
  - consultations via phone and video platforms
  - electronic medication management systems
- Drug / Medication databases
- Drug selection
- Emerging technologies, such as:
  - machine learning in drug discovery
  - the role of AI:
    - decision support tools for prescribing
    - personalised therapy
    - predictive modelling
    - reshaping pharmacological research
- Forms of target concentration and exposure
- Laboratory methods
- Principles of deprescribing
- Principles of pharmacodynamics and pharmacokinetics
- Rational prescribing

AIM

Geriatric pharmacology

- Dosing in older patients[16], considering physiological changes with ageing
- Managing polypharmacy
- Monitoring and support devices for dementia patients

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

	PCH	• Appropriate methods for, and limitations of, extrapolating adult data to children • Principles of prescribing to children, such as: » adjustments in dosing, such as mg / kg dosing » selection and concentration of liquid formulations
ELIGIBILITY CONSIDERATIONS Advanced Trainees will assess the patient's current condition and plan the next steps.		• Indications for, and adverse effects of, commonly used drugs, such as those used in: » anaesthetics » emergency medicine, such as: ○ fluid therapy ○ intravenous fluids » internal medicine » oncology » psychiatry » rheumatology » vascular and metabolic medicine • Indications, limitations, and usefulness of therapeutic drug management (TDM) in patient management, such as: » aminoglycosides » busulfan » tacrolimus » warfarin » vancomycin • Patient history, including previous adverse drug reactions and specific health conditions that influence drug choice • Patients' current medications and potential drug-drug interactions • Presence of comorbidities, complex multimorbidity, or multimorbidity • Variation based on individual patients': » age, including paediatric growth and development and adult senescence » concomitant medicines and complementary products » genetics » lactation » pregnancy » sex
	AIM	• Indications for, and adverse effects of, drugs mainly used for older persons' health
	PCH	• Indications for, and adverse effects of, drugs commonly used within paediatrics
LESS COMMON OR MORE COMPLEX PATIENT CONSIDERATIONS Advanced Trainees will understand the resources that should be used to help manage patients.		• Literature search, such as: » Embase » New Zealand Formulary (NZF) » PubMed • Medicine and drug information services • National formulary
	AIM	No Adult Internal Medicine-specific content identified

	PCH No Paediatrics & Child Health-specific content identified

UNDERTAKING THERAPY

Advanced Trainees will monitor the progress of patients during the therapy.

- Adjustments in therapy based on response and adverse effects
- Development and use of patient information resources about drugs
- Drug interactions, and their impact on therapy
- Monitoring parameters
- Off-label / Unlicenced medicines
- Patient counselling about pharmacotherapy

AIM No Adult Internal Medicine-specific content identified

PCH

- Counselling parents about measuring doses and administering medicines to children
- Extemporaneous formulations

POST-THERAPY

Advanced Trainees will know how to monitor and manage patients post-therapy.

- Strategies for tapering or discontinuing therapy based on therapeutic goals and patient response
- Techniques for monitoring therapeutic outcomes and recognising signs of drug toxicity, such as:
  - » bedside evaluation
  - » biomarkers testing, including:
    - hepatotoxicity markers, such as:
      - alanine aminotransferase (ALT)
      - aspartate aminotransferase (AST)
    - nephrotoxicity markers, such as:
      - creatinine

AIM No Adult Internal Medicine-specific content identified

PCH

- Strategies for blood sampling, and for measuring analyses with small sample volumes

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.

- Decision support tools to assist in drug selection and dosing
- Ethical considerations, such as:
  - » access to treatment
  - » cost considerations
  - » managing conflicts of interest, particularly in relation to pharmaceutical industry relations
  - » patient autonomy in prescribing
- Factors that affect drug use, such as:
  - » age and development
  - » comorbidity
  - » concomitant drugs and complementary products
  - » ethnicity
  - » lactation
  - » nationality
  - » pregnancy
  - » sex
  - » socioeconomic status
- Factors that affect professional and public perception of drugs and their use, such as the effects of advertising, marketing, and media
- Factors that determine the benefit to harm balance in therapeutic interventions

- Legal considerations, such as:
  - » implications of prescribing errors
  - » importance of documentation and informed consent
  - » national and local guidelines for the quality use of medicines
- Pharmaceutical policy and legislation, such as:
  - » national and international regulations in drug approval, availability and pricing
- Regulation of scheduled substances and the associated scheduling process
- Strategies to improve patient adherence, especially in chronic disease management, which is crucial for the efficacy of pharmacological interventions

AIM	• Extrapolation of standards adult data to advanced ageing
PCH	• Extrapolation of adult data to children • Prescribing and calculation errors in children