RACGP

Curriculum and syllabus for Australian general practice (7th edition)

The specialist GP as a scientist, educator and researcher

RACGP Curriculum and syllabus for Australian general practice (7th edition): The specialist GP as a scientist, educator and researcher

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We acknowledge the Traditional Custodians of the lands and seas on which we work and live, and pay our respects to Elders, past, present and future.

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The specialist GP as a scientist, educator and researcher

Context

General Practice is both an intellectual and clinical discipline that integrates education, research, and evidence-informed care. As well as being clinicians, GPs are also scientists, educators, and researchers who advance healthcare through teaching, inquiry, and critical reflection.

All GPs should integrate current evidence into everything they do. GPs need to be research literate and research active, well-informed, and helpfully curious, as they partner with patients to make the best possible healthcare decisions in a whole person approach. All GPs should participate in regular clinical discussions with professional colleagues, during which clinical dilemmas are considered in the light of the best available research literature, clinical experience, and local resources.

Research literacy encompasses a range of competencies, including the ability to critically interpret – and apply to one's own practice – research from a range of methodological approaches. It also includes assisting patients to make informed decisions by clearly communicating research findings. Useful clinical evidence will come from both quantitative and qualitative approaches.[1] GPs must engage with evidence that is relevant to the complex, uncertain, and multimorbid nature of general practice patients and translate findings into practice.[2–6]

New research and evaluation of current practice supports specialist GPs to explore or address questions arriving from clinical practice, education, and health system contexts. These questions may relate to patient outcomes, service delivery, quality improvement, or equity, and require an understanding of common research and evaluation methods relevant to general practice. Through this inquiry, GPs contribute to refining care, improving systems and strengthening the evidence base that underpins general practice. Some may pursue an academic pathway and develop more advanced academic skills.

When engaging in research, GPs apply ethical approaches. They engage in culturally safe research involving Aboriginal and Torres Strait Islander people where they partner with communities, respect data sovereignty, apply strengths-based and co-design approaches, and ensure reciprocity through meaningful sharing of findings for sustainable community benefit. Such approaches align research activity with community priorities and support self-determination.

Teaching is a fundamental to quality medical practice.[7] Being a skilled clinician does not automatically make one a skilled educator.[8] Developing effective teaching skills requires dedicated learning.[9]

Education in general practice occurs across diverse contexts – within consultations, practice teams, and broader communities. GPs teach, supervise, mentor, and role model for students, trainees, peers, and other health professionals. Within general practice training, there is a need for vertical integration of teaching and learning.[10] While GP trainees do not hold final responsibility for patients seen by medical students,[11] they play a valuable role in their education.[12–14] GPs also engage in peer education ,[15] support interdisciplinary learning, and contribute to community group education. Some may pursue advanced skills to become supervisors or medical educators.[15]

Most general practice education is experiential. Context and learner needs are fundamental and require flexible and adaptive approaches. Case-based learning, [17,18] coaching and feedback are important educational activities.[18,19] It is important that learning environments are free from bullying and harassment, are inclusive and culturally safe, and allow educational discourse to occur with a focus on improvement.[7,26,27]

Together, the roles of scientist, educator, and researcher reinforce general practice as a reflective, deliberate, and evidence-informed discipline. GPs embracing these roles enhance patient care, contribute to the profession's knowledge base, and nurture future generations of practitioners.

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Competencies and Learning outcomes

Competencies	Learning outcomes
The specialist GP is able to:	**The specialist GP is able to:**
Integrate relevant clinical guidelines, research evidence, and practice data into clinical practice	discuss evidence for clinical decisions, including scientific and statistical information, and the limitations of evidence access and interpret research updates, decision aids, guidelines, and evidence summaries apply relevant epidemiological information to clinical decisions apply research findings to clinical decisions, considering patient preferences, culture, context and beliefs, clinical judgement, and current knowledge and practice.
Provide education, teaching, and mentoring to colleagues, students, and others in the practice	adjust teaching to the context, such as small group or individual teaching use a variety of education strategies in formal and informal settings demonstrate the ability to evaluate individual learners' needs and adapt the educating style to suit manage challenging educational situations such as disruptive participants in groups or giving feedback about poor performance articulate thought processes and clinical reasoning when presenting information to others deliver education that is based on up-to-date evidence plan and deliver a structured education session that includes writing effective learning outcomes and utilises adult learning principles seek and provide feedback that is balanced, learner-centred, specific, and has a positive impact on learning write effective and defensible reports based on evidence about learners especially in the context of assessments reflect on the effectiveness of their teaching approach and evaluate own performance.
Identify researchable questions and topics that warrant further research. Demonstrate an understanding of common research and evaluation methods relevant to the general practice context	appraise the utility of research, through critical appraisal and understanding of the aims and principles of quantitative and qualitative approaches

	recognise which questions relevant to general practice that could be answered through research and what common methods could be used to answer these.
Participate in appropriate research as opportunities arise. Identify gaps in the research literature in areas of interest, and the importance of research evidence in advocacy for patients and general practice	identify when research projects in specific populations, and evaluating complex interventions, may require particular research designs, including co-design and strengths-based approaches advocate for and / or contribute to ethical research in general practice which addresses patient needs and health gaps know how to participate in ethical, quality, and appropriate research – whether as a research participant, provider or gatekeeper to datasets, or when assisting with participant recruitment.
Engage in culturally-safe research as opportunities arise by partnering with Aboriginal and Torres Strait Islander Peoples, upholding data sovereignty, and applying strengths-based approaches. Ensure reciprocity in research by valuing community priorities, sharing findings meaningfully, and fostering sustainable benefits	partner with Aboriginal and Torres Strait Islander peoples at all stages of research uphold Indigenous Data Sovereignty principles apply strengths-based, culturally informed, trauma informed research methodologies. ensure research outcomes deliver tangible and reciprocal community benefit.

Key areas of learning

In clinical practice:

- perform evidence-based practice, including use of point-of-care resources and shared decision-making
- critically appraise research for relevance to clinical practice
- recognise limitations in published research and guidelines and have strategies on how to practise quality care when the published evidence or guidelines are not relevant or useful to your patient
- be able to use electronic decision-support systems with appropriate considerations of relevance to a specific setting
- understand how to access and utilise general practice data safely and legally.

Understand:

- adult learning theories, and how these apply to learning in general practice:
- the importance of a curriculum and syllabus, including the role of the hidden curriculum (unofficial, unintended lessons and values passed on through practise)
- what makes a positive learning environment and the impact this has on learner and patient perspectives
- evidence in medical education, including being able to identify, assess, and apply evidence to practice
- how to undertake purposeful reflection and evaluate the effectiveness of teaching

Take part in and lead case-based learning through:

- opportunistic response to questions from students or colleagues
- random case analysis
- formal case-based discussion.

When being an educator:

- be able to provide planned teaching in group and individual situations in online, remote, and face-to-face settings – using a variety of teaching strategies and planned activities; eg use of questions, role play, and simulation
- be able to teach a procedure through role-modelling, specific instruction, and coaching
- effectively give and receive specific, learner-centred feedback, both oral and written, that is tailored to the learner and the individual situation
- demonstrate coaching skills, including questioning, supporting and guiding learners to learn a new skill or behaviour, in both formal and informal situations
- ensure that teaching that directly or indirectly involves patients considers confidentiality and consent; eg teaching involving case discussion
- utilise technology for educational evidence and delivery.

When considering research literacy:

- understand quantitative and qualitative approaches to research
- understand evidence hierarchies, such as the NHMRC evidence hierarchy and GRADE
- apply epidemiology information, including prevalence, incidence, relative risk, and hazards / odds ratios

- Interpret measures of effectiveness or accuracy, including sensitivity, specificity, and positive and negative predictive values.
- understand approaches to analysing the existing research literature including literature reviews and meta-analyses
- understand the basis of trustworthiness in interpretative and qualitative research.

In regard to research engagement:

- design preliminary research plans that include a range of approaches and methods to answer clinical questions or enhance your understanding of clinical and other problems
- understand when and why Human Research Ethics Committee approval is needed for research, and how to obtain approval before starting your research
- understand the principles of Indigenous Data Sovereignty
- understand the elements of research participation that are important to participants
- understand implementation and evaluation research, including action research.

Opportunities for learning

Words of wisdom

- Research may appear to be written for researchers and not clinicians. The vocabulary can be unfamiliar and off-putting at first (eg 'quasi-randomised clustered RCT nested within a cohort' or 'SMD 0.6 95% CI 0.3-0.7 I2 = 23%'). You are not expected to intuitively understand this. It's helpful to ask a colleague who is a clinician researcher, academic, or who has an interest in evidence-based medicine, and you will improve over time. If you don't have easy access to a colleague, be aware that most GPs in research or academia would be happy to put you in touch with someone appropriate. Ask your supervisor or medical educator, or check online for contact details for a rural clinical school or department of general practice in your state or territory.

- Statistical data becomes easier to interpret when you understand that there are some statistics for effect size (eg Cohen's d, hazard ratio, absolute risk) and others for hypothesis testing (eg p-value, confidence interval). There are some great online resources to help, written by and for GPs (see learning resources section).

- When reading a research paper to answer your clinical question, try asking yourself, 'What is the research question the researchers are trying to answer and how similar is this to my clinical question?', and then 'How did they go about doing this?'. Were the patient participants similar to your patient? Also, pay attention to the outcomes. Are they relevant to your patient?

- Don't underestimate the sophistication of qualitative research (including the importance of theoretical perspectives, conceptual frameworks, and differences from quantitative approaches) and evaluation methodologies. Make sure you have an expert on your team.

- As an educator, ask questions before giving answers – you will encourage better learning using this approach. It can also give you information about what the learner already knows and what help they want. Expect and encourage learners to question all the answers. Keep the goal in mind. What are the learning outcomes you hope to achieve? Knowing the end outcomes will help you tailor your approach. Don't try to teach too much in one go. One or two things learnt well is a reasonable outcome.

- Don't underestimate your impact as a role model for other learners. Research has consistently demonstrated that learners gain an understanding of the values and ideology of the profession by observing the behaviour of those they aspire to be like. Even if you are not aware that you are teaching, learners are learning; from you, your reflective practices, your thinking, your interactions with staff and patients, and your notes. Sharing your own uncertainties can be valuable teaching. Teachers don't have all the answers. Disclosing when you don't know and showing how you manage this uncertainty is a powerful demonstration of how you manage the uncertainty of general practice. Your learner will be more inclined to share their uncertainties, and it becomes an opportunity for you both to explore how to find answers to questions and learn together!

Learning strategies

On your own

Choose a condition that you commonly see in your practice (eg obesity). Write a list of the types of research that would be useful to help you manage a person with that condition. Consider basic science research, and research which evaluates the effectiveness and implementation of interventions. Include qualitative approaches exploring the perspectives and experience of patients, and how this might change your approach to providing care.

- *Could you design a research study exploring the experience of people with the condition you selected? What type of research did you consider?*
- *Can you identify how different types of research help address different types of research questions?*
- *Can you identify any gaps in the literature? How could you undertake a literature review? Are you aware that you can request the librarians at the RACGP John Murtagh Library to do a literature search?*
- *Who could help you design your study? What is a co-design approach?*

Study a textbook chapter or module covering basic principles of evidenced-based medicine (see learning resources section).

- *Make a list of common statistical terms, such as p-values, confidence intervals, effect sizes, odds ratios and mean differences. How well do you understand these terms? Who can you ask to explain them to you?*
- *Could you make a short video that would teach a colleague how to understand these terms?*

Consider the role of a GP role model.

- *Do you consider yourself a role model? Who are you a role model for? What behaviours do you feel you model well? Which ones do you need to work on? Does being a role model change your practice at all?*
- *Does your role-modelling align with good medical practice?*

Read about random case analysis and identify the rationale for this approach. Practise doing a random case analysis on a consultation from your last session.

- *How did you go? What elements did you identify? Could you do this with a learner? Was it a helpful education method?*

With a supervisor

With your supervisor (or another member of your practice who has research experience), choose a clinical question about the effectiveness of an intervention which is relevant to one of your patients. Find a systematic review of the evidence. Explain your search to your supervisor, your appraisal of the findings, and how you might apply this to practice. Discuss important information such as the quality of the evidence, risk of bias and number needed to treat or harm.

- *Were your explanations clear and accurate?*
- *Are the findings relevant to your patient?*

Discuss a condition or problem relevant to your practice or population. Find a qualitative research article which investigates this topic. Discuss the merits of this work and how the findings can be used in your practice.

- *Can you explain to your supervisor how qualitative findings add to your understanding of the topic and the implications for patient management?*

Discuss with your supervisor how they go about giving corrective feedback and acting on corrective feedback that they receive. Reflect on how well their description is balanced, learner-centred, and specific

- *What has worked for them before? What hasn't worked?*
- *Do they use the same feedback style every time?*
- *What do they find most challenging and how do they manage that?*
- *How do they process corrective feedback? What strategies do they use to help action this feedback?*

Read the article by Harden and Crosby (2000) from *Medical Teacher* which describes 12 roles of the medical teacher: AMEE Guide No 20: The good teacher is more than a lecturer the twelve roles of the teacher. Consider it from your perspective. Do you agree with these? What do you think of these roles? What roles do you find easy to do, which ones are harder?

- *Discuss your thoughts with your supervisor*
- *Explore their thoughts on the roles of a medical teacher and how it aligns with their conceptions and experience*

In a small group

Choose a clinical guideline that includes evidence for both medication and non-medication interventions. Each participant takes a closer look at one recommendation from the guideline and checks the references for the recommendation. Access and read the (key) referenced studies that form the basis of the recommendation.

- *What level of evidence exists for your recommendation?*
- *What kind of study design exists for this evidence, and is this what you expected?*

Read and appraise a journal article together. Discuss the implications for your practice.

- *Can you agree on how this research paper fits into current knowledge and whether you should modify your current practice? What exactly would you plan to do differently?*
- *For a systematic review: Can you teach a colleague how to interpret the summary of findings table, forest plots or other statistical information?*
- *For a qualitative paper: Can you discuss the principles of qualitative approaches to research with a colleague? Include concepts of purposive sampling, reflexivity, power differential, descriptive coding, analysis and interpretation. What is inductive thematic analysis and what is deductive thematic analysis. Are there other ways of analysing qualitative data? What is meant by theory in qualitative research, and why is it important? Which methods can be used in qualitative research? What is action research? Why is an observational component useful in qualitative research?*

Plan a topic to present to a small group, such as the other doctors in your practice. Alternatively, deliver an education session to your peers.

- *Discuss the plan as a group*
- *If you delivered a teaching session, ask for feedback on your teaching style and how well you managed the group*
- *Reflect on how well the group engaged with your teaching*

Discuss with your group how cultural background needs to be considered when teaching.

- *How does this compare to the Aboriginal and Torres Strait Islander health curriculum framework?*
- *What if there are participants from other cultural or linguistic backgrounds?*

With a friend or family member

Choose a Cochrane review (or other systematic review) on a topic of interest to your friend or family member. Explain the information in the summary of findings table.

- *Can you explain how the GRADE of evidence helps us understand research quality?*
- *How does relative risk differ from absolute risk?*

Identify a clinical decision of interest to your friend or family member (eg whether to have a screening test). Practise a conversation using shared decision-making.

- *How could you explain the limitations and risks of ordering investigations for uncommon or rare diseases? Include the concept that rates of false positives and negatives depend on the pre-test probability of a disease*

Ask a (non-medical) friend or family member to nominate a topic for you to teach them. Make a plan for your teaching. Ask your friend how well they understood your teaching. Ask them to summarise what they learnt.

- *How well did their learning match your plans for what they would learn?*
- *What would you change in the plan or execution to improve it for next time?*

Teach your friend a non-medical skill. Evaluate how well they learnt the skill. Ask for feedback on your teaching.

- *How did you evaluate how well they learnt the skill*
- *Based on their feedback, what could you improve in future teaching of skills?*

Reflect on one of your teaching experiences. Consider using an established framework such as SPROUT or Five Rs for your written reflection. Consider how this teaching experience has contributed to your effectiveness as an educator, including your ability to adapt to the learning environment and individual learners, and how this will shape your approach in the future.

- *Would you use this framework again? What was it particularly helpful with? Are there any relevant areas you feel it did not consider?*

Case example

Steve is a 35-year-old man who attends having injured his knee playing soccer with friends as part of a regular weekend informal game four days ago. He heard a pop at the time and could not continue playing. The knee then became swollen and whilst he can hobble on it, he feels wobbly. On examination you are suspicious of an acute ACL tear. He works as an accountant. You note from his records he attends infrequently, usually with an acute illness or injury. He has no significant past history or medications. When you update his details he states his father has just been diagnosed with prostate cancer aged 60 years and asks if he should be tested.

You have a final year medical student consulting with you this session. You are also aware there is a local trial enrolling patients for randomisation comparing a non-surgical bracing approach to surgery for ACL tears, which he appears to be eligible to participate in.

When specifically thinking about this role, questions in a case-based discussion may include:

- What clinical guidelines would you consider in regard to this consultation?
- If you were to look for primary research evidence to assist, where would you look and how would you search?
- If he had found a paper on PSA testing and asked your opinion on the paper, what factors would you consider in your response?

The medical student takes the history and performs the examination with Steve's permission. When asked the student suggests the diagnosis was probably a patella dislocation. Your assessment is that an ACL tear is the most likely diagnosis. How would you explore the student's thinking and reasoning? How would you manage with Steve in the room?

- You are later running a small group session for your practice about acute knee injuries. How would you decide what to include and design the session?
- In your practice you are auditing knee imaging. How would you decide the criteria to audit against?
- How would you explain a trial to Steve? What does randomisation mean from a patient perspective?
- The trial has a number of inclusion and exclusion criteria. How may that impact future utility of the evidence?
- If you were working on the Torres Strait Islands, and the research project was about physiotherapy and acute knee injuries, what are some factors to think about considering the project's request to refer suitable participants?

Learning resources

The curriculum website includes learning resources within each unit.

Assessment

Content in this unit will be assessed in a variety of ways.

Workplace based assessments

Mini-CEX	RCA	MSF	CBD	Reflective exercise	Audit	Mid and end term assessment

Fellowship examinations

AKT	KFP	CCE

KEY

- Expected to be assessed here always
- Often assessed here but not in every example / case / assessment
- May at times be here or contribute to the assessment

ABBREVIATIONS

Mini-CEX – Mini-clinical evaluation exercise
RCA – Random case analysis
MSF – Multi source feedback
CBD – Case-based discussion
AKT – Applied knowledge test
KFP – Key feature problem
CCE – Clinical competency exam