Strengthening Australian Clinical Research – Group of Eight Submission to the Medical Workforce Reform Advisory Committee

Go8 Recommendations for the identification, training and support of future medically qualified research leaders

Contents

Foreword

In 2018, the Group of Eight (Go8) Deans of Medical Faculties (DoMS) agreed that after many years of growing concern, that they must, for the future health benefit of every Australian, actively advocate for changes to the future supply of clinician researchers in Australia – those with **both** research training and health training.

The COVID-19 pandemic illustrated for the DoMs just how critical and urgent their advocacy had become - because clinical researchers are critical to health and medical innovation – particularly in a clinical setting.

Although Australia has had a proud history of producing such researchers, that has been fortuitous (some would say luck) because it has been largely an ad hoc pipeline with no guarantee that it would, or could provide for the increased future health demands of an ageing Australian population.

This is a core issue for the Go8. We undertake the majority of competitive research funded by the National Health and Medical Research Council (NHMRC) - $584 million or 66 per cent of funding announcements in 2019, and we also graduate the majority (approximately 60 per cent in 2019) of Australia's medical practitioners.

This issue has been of concern in Australia for the best part of a decade (and even longer internationally in the US and the UK) with medical peak bodies and some specialist colleges leading the desire for change and a removal of ad hoc processes - these include the Clinical Academic Pathways Working Party (MDANZ, RACS, RACP, AMC, AAHMS and the AMA).

Currently, there are also pilot programs such as the Melbourne Academic Centre for Health (MACH) MACH-Track program[1] for GPs seeking to complete a PhD through the University of Melbourne.

However, given the lack of a national framework for training clinician researchers and seemingly no successful international models, it was deemed increasingly important that there was collective Go8 view regarding what a national model should be.

The timing of this advocacy focus is important. Through the $20 billion Medical Research Future Fund (MRFF) the Australian Government has initiated a $190.8 million 10-year program in support of clinician researchers. The Government has also commissioned the design of a National Medical Workforce Strategy (NMWS) which is overseen by the Medical Workforce Reform Advisory Committee (MWRAC).

In 2020 we have also seen how critical this cohort of researchers is in the context of COVID-19.

As we have tackled COVID-19 clinician researchers have been visibly pivotal to the national effort. Since COVID-19 was first identified in December 2019, everything that we have learnt about the condition and the SARS-CoV-2 virus that causes it, has come from research.

Having a clinical workforce that can quickly understand and contribute to such research means improved advice for Australian governments and improved front-line treatment for Australia's patients.

Clinician researchers have membership of the key committees advising government including key bodies: the Australian Health Protection Principal Committee (AHPPC) and the Communicable Diseases Network Australia (CDNA).

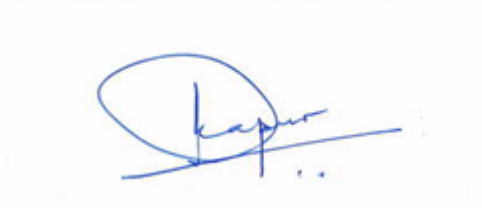
Both former Chief Medical Officer for Australia and now Secretary of the Department of Health – Professor Brendan Murphy – and the Chair of the Australian Medical Research Advisory Board (AMRAB) – Professor Ian Frazer AC – are clinician researchers.

Clinician researchers were also pivotal on the Go8 COVID-19 "Roadmap to Recovery" taskforce, which produced a comprehensive, outcomes-focussed report to Government released in late April 2020. This report of over 11 chapters and nearly 200 pages contained 60 COVID-19 management recommendations based on advice from experts including epidemiologists, virologists, economists, mathematicians, philosophers, psychologists as well as experts in indigenous health, sociology, and communication.[2]

There will now be more consultations – not least about funding – that are required to finalise a framework with medical schools, specialist colleges, peak bodies and importantly, State and Federal health authorities – many of whom have provided feedback on this document.

The Go8 looks forward to leading the development of this essential structure in the national interest.

In conclusion, we would like to thank everyone who has contributed to this Go8 project, in particular, Professor Stuart Carney – Deputy Executive Dean and Medical Dean in the Faculty of Medicine at the University of Queensland - who has led the project, the Go8 DoMs, and an expert group of Go8 researchers who provided initial advice on the direction and framing of the work.



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Executive Summary

Clinician researchers are both clinically qualified and active in research. They typically see patients treating them for conditions into which they are also researching in an effort to find cures, better treatments or to seek a better understanding of the condition – whether it be cancer, diabetes, MS, heart disease, mental health issues or many other conditions.

As members of international research networks, they also enable the early adoption of critical research discoveries from overseas.

Researchers may be clinically qualified in medicine, allied health or other health professions. However, this report restricts the use of the term clinician researcher to medically qualified researchers. The reason for this is to test a new model for research training in Australia in one specific health profession with the hope that if successfully implemented, it can be expanded to a range of other professions (see Recommendation 15). This restriction of considerations to medically qualified researchers also and importantly aligns with the current development of the National Medical Workforce Strategy.

In terms of research training the report focuses in the main on PhD pathways for clinician researchers. However, in a clinical context, practitioners may come to research through a variety of non-PhD pathways, for instance a Masters degree followed by training through team-based research activities. While the report does not deal explicitly with these pathways, it is the intention that the proposed framework is sufficiently agile to accommodate alternative approaches to formal research education and training which are equivalent to a PhD.

In this context, while clinician researchers have always played a key role in the Australian health system, this has never been more evident than during the COVID-19 crisis. Clinician researchers have been in the front line of the Australian response to COVID-19 as clinicians, researchers and in providing evidence-based advice to state, territory and commonwealth governments

Planning for the future of Australia's health system cannot be successful without a plan for the research workforce that will drive innovation and deliver better value health care in a post COVID-19 world. The Go8 has identified the cohort of clinician researchers – who are both medical practitioners and researchers - as key to this research workforce.

This is particularly the case for regional, rural and remote areas of Australia where opportunities for clinician researchers bring with them a focus on health issues particular to these communities and also the potential to attract and retain health professionals.

While Australia has a history of training world-class clinician researchers as well as recruiting them from overseas, there are signs that the clinician researcher cohort in Australia will not be sufficient to underpin the innovation required to support Australia's future health needs. The COVID-19 crisis has particularly emphasised the need for Australia to increase its capacity to train and retain its own clinician researchers as a matter of national sovereignty and resilience.

The Go8 is proposing a structured and flexible *Australian Integrated Clinician Researcher Training Pathway (AICRTP)* that cultivates interest in research and lays out clear and supported pathways for how an interest in research may lead to a career as a clinician researcher. There will always be room for the serendipitous career of a clinician researcher that many of our current superstars have followed, however the Go8 model is looking to provide this cohort of researchers at a scale that the country will need for its health future.

This report first sets out the broader context of the clinical research workforce, the opportunities for Australia that can be delivered on by this workforce and the cost of not systematically developing and supporting this workforce.

The next section explores the pressure points in the current pathways for training clinician researchers and the need for a formal and funded national system to train clinician researchers.

The report makes recommendations in three areas

1. Setting national targets for medically qualified clinician researchers and monitoring.

2. The development of an *Australian Integrated Clinician Researcher Training Pathway (AICRTP).*

3. Critical enablers such as mentoring.

There is an urgent need to establish flexible and transparent training opportunities during vocational training to nurture and support our future medically qualified research leaders. The core recommendations in this report are for a general framework of attractive research training opportunities, which are integrated with vocational training. This comprises three elements:

i. ***Clinician Research Registrar phase*** to develop research skills and a competitive Higher Degree by Research application.
ii. ***PhD phase*** to complete a PhD (or equivalent).
iii. ***Senior Clinician Research Registrar phase*** to undertake post-doctoral research, complete vocational/fellowship training and prepare for first specialist/GP appointment involving clinical research.

In addition, to complete the career pathway there is also a need to ensure support for the first substantive position involving research beyond the Senior Clinician Research Registrar phase – whether that is at a university, medical research institute or in a clinical facility.

While this report sets out recommendations for a general framework (AICRTP) for clinician researcher training and careers, the detailed implementation of such a framework will require a truly integrated model developed between universities, research institutes, and health services, specialist Colleges, and government and other funders. The implementation will also have to take into account the different health systems in different states and also the different challenges in a metropolitan versus a regional setting.

The Go8 is committed to working with all partners on these matters in the interest of securing Australia's clinical research future.

Summary of recommendations

The Go8 makes the following series of recommendations to strengthen Australian clinical research.

National targets and monitoring the health of the clinical research workforce

1. That the following initial targets are established:
    - There are positions each year for at least 5% of medical graduates to enter a research training pathway leading to a PhD; and
    - There are GP or specialist positions that have a research component or other funding opportunities for research each year for at least 3% of medical graduates when they complete vocational training.

2. That Australia establishes a national target for the number of clinician researchers required to support Australia's future health system across each specialty and research area and continues to monitor these targets.

3. That a survey of clinician researchers at Australian medical schools be established to inform planning and future target setting. This should be similar to the annual survey run by the UK Medical Schools Council.

An Australian Integrated Clinician Researcher Training Pathway

Medical School

4. That medical students should continue to have the opportunities to complete degrees which involve the conduct of research and/or the development of advanced research skills e.g. an honours year or a Masters and these should be incentivised through the provision of scholarships.

5. That a limited number of structured MBBS/MD-PhD programs should be developed or maintained and formally supported through the provision of scholarships.

Pre-vocational medical training

6. That universities and health services should offer research training opportunities, through an *Integrated Clinician Researcher Transition Program* in the first two years of postgraduate training. These should incorporate at least 5% of internship positions each year, be managed in partnership by health services and universities and allocated through a competitive process aligned with state-based internship recruitment rounds.

Vocational medical training – key recommendations

7. The establishment of a formal three-phase *Integrated Clinician Researcher Vocational Training Program*:
    - ***Clinician Research Registrar phase to develop research skills and competitive Higher Degree by Research application.***
    - ***Studentship to complete a PhD (or equivalent).***
    - ***Senior Clinician Research Registrar phase to undertake post-doctoral research, complete vocational training and prepare for first specialist/GP appointment involving clinical research. These positions would be open to researchers with formal research education and training judged equivalent to a PhD.***
8. At least 5% of vocational training positions should be included in the Integrated Clinician Researcher Vocational Training Program.

9. There should be pay parity with the registrar pay scale for appointees to the Integrated Clinician Researcher Vocational Training Program. This should include PhD/research fellowship scholarships or equivalent.

Post – Vocational Training

10. Universities and research institutes continue to invest in senior lecturer/senior research fellow or equivalent positions, which are suitable for recently qualified GPs and specialists with relevant post-doctoral experience.

11. Research funding agencies grow the number of early career awards and target these at newly qualified specialists and GPs. The fellowship should be used to also grow medical research capacity in specialties that are historically underserved.

Other Critical Enablers

12. That mentoring scheme(s) be established for participants in the clinician researcher training pathway as a combined effort of universities, specialist colleges and peak bodies.

13. Universities, research institutes, funding agencies, specialist colleges and peak bodies should actively promote clinician researcher careers to medical students and doctors. This should include a clinician researcher careers website, showcase events and extra-curricular opportunities to participate in research during medical school and postgraduate training.

14. Specialist colleges, health services, universities and research institutes work together to target research training opportunities to medical students and graduates who are likely to be the future clinician researchers. This should include a review of the criteria for entry into vocational and fellowship training as well as the position descriptions for GP and specialist roles to ensure that a PhD is seen primarily as a pathway to a research active career.

Beyond Medically Qualified Clinician Researchers

15. Following the establishment of the Australian Integrated Clinician Researcher Training Pathway (Medical) an expanded or parallel program(s) should be established to support the training of nursing and allied health professional researchers. In addition, the training pathways should also be adapted to develop clinician educators.

The broader context of the clinical research workforce, opportunities and the cost of inaction

In 2016-17 the average Australian visited a GP 6.1 times and saw a specialist on 0.95 occasions[3]. In total there were 11 million hospitalisations in Australia[4] and total spending on health in Australia in 2016-17 was $180.7 billion[5]. According to the OECD Australia's expenditure on health is 9.3% of GDP[6] placing Australia 15th out of 36 countries, however our health system was ranked second out of 11 developed countries by the Commonwealth Fund and number one for Health Outcomes[7].

Despite this high level of performance and the sophistication of Australia's health system, there are opportunities to increase efficiency and effectiveness in our complex health environment. This is particularly pressing as we grapple with an increase in chronic conditions, comorbidity, an ageing population and health inequities. Opportunities exist in improving primary care, access to medicines, integrated patient care – including consideration of a value-based healthcare approach – incorporating digital technology and genomics into personalised health care, improved health service delivery, reducing hospital visits, safeguarding our biosecurity and critically, developing the workforce that can deliver on these challenges.

Taking advantage of these opportunities will depend on research in the health and medical sciences being translated into health care solutions and the workforce to do this. Australia has the fundamentals to be well placed in this regard. In 2020-21 the Medical Research Future Fund (MRFF) is scheduled to reach full capitalisation of $20 billion – resulting in as much as $1 billion a year in translational research in addition to the approximately $800 million in annual announcements of competitive research funding by the National Health and Medical Research Council (NHMRC).

It is also the right time to be considering how we nurture these researchers in terms of activities currently underway in the Health and Medical Research space. The Commonwealth Department of Health is developing a National Medical Workforce Strategy[8] and the NHMRC is working through the implementation of its new grant programs[9] with an increased emphasis on the real-world impact of the researchers it funds[10]. The NHMRC has also commissioned a survey of clinician researchers[11] that will provide a data source to potentially inform the detailed design and implementation of a formal training and career pathway for these researchers.

Australia's health and medical research sector is one of the strongest in the world. According to the Government's 2018 assessment of university research – Excellence in Research for Australia (ERA) – Australia's universities produced the equivalent of 142,000 research articles in Health and Medical Sciences and Biological Sciences between 2011 and 2016. This research was undertaken by a workforce of nearly 12,500 FTE of research staff with nearly 6,500 FTE or 52% of the national total in the Go8.[12,13] Across the Go8 alone ERA data reveals that nearly 4,000 research FTE are working in 115 research groups rated at the highest level internationally.[14]

In 2018 Go8 institutions produced 61% of Australia's medical graduates educated in this research-intensive context.[15]

More broadly than the Go8, Australia's health and medical research sector contains thousands of researchers working in independent Medical Research Institutes, hospitals and health services, government agencies, private industry and other research centres. Australia also has 21 medical schools preparing high-quality graduates.

Key to linking the needs of a 21st Century health system to Australia's research capacity will be medical practitioners who are also researchers – so called *clinician researchers* also sometimes referred to as clinical academics or clinician/physician scientists. In particular, those who spend time as both active clinicians and researchers.

Despite the great potential of Australian research and health systems there has been growing concern regarding the future supply of clinician researchers in Australia[16]. In 2015 a working party[17] was established to drill down into the future supply of clinical academics and conducted two summits on the issue.[18,19]

Requirements of the research and clinical workforce was also a key point of discussion at the Medical Research Roundtable conducted by the Go8 at Parliament House with hospital CEOs on 4 December 2018. Key issues around

the research workforce were expertise in the future needs of applying digital technology to health and in improving health service delivery.

These concerns are well founded given the Australian National Health Workforce Data Set shows that in 2017 of the 1,346 registered medical practitioners who reported researcher as their principal job area 39% were 55 years of age or older and only 41% were female.[20]

Between 2013 and 2017 the number of medical practitioner researchers dropped by 3.9% at a time when it should have increased to meet the increased demand for medical researchers in anticipation of the ramping up of the MRFF disbursements. During this same period the MDANZ Medical Schools Outcomes Database reports that at least 60 per cent of medical graduates were interested in research as part of their future medical career.[21]

The future supply of clinician researchers is also an issue of long-term international concern particularly in the US, and the UK. In response, the US the National Institute for Health (NIH) funds the training of Physician Scientists in a combined MD-PhD program in a select number of medical schools through the Medical Scientist Training Programs (MSTP) and in the UK the National Institute for Health Research (NIHR) through the Integrated Academic Training (IAT) Programme[22]. Although the US has historically primarily relied on MD-PhD programs, there is increasing interest in funding research training opportunities during postgraduate clinical training with guaranteed protected time to save "the endangered physician-scientist" as part of "a plan for accelerating medical breakthroughs."[23]

An informal Go8 benchmarking of clinical academics at UK medical schools suggests that Australia may have only two-thirds of the clinician researcher FTE per capita as is employed at UK medical schools.

A training pathway for clinician researchers would also allow consistent and programmatic support for research quality in alignment with the NHMRC's Research Quality Strategy[24].

What is clear is that not improving the supply and assuring the quality of clinician researchers through a formal training pathway – the cost of inaction – will result in a degradation of Australia's medical research sector and in particular the workforce required to deliver on the translational research agenda of the MRFF. It will also result in a lack of research-qualified clinicians in key specialty areas. This is raised in more detail in the next section.

While this paper limits its vision to medical practitioners who are also researchers it should be noted that much of the preceding discussion also applies – in the broader health workforce context – that is, the importance of research qualified practitioners from other health professions and also educators. It is hoped that if a model for medical practitioners can be firmly established, then this can be adopted to encompass these other streams, as is the case in the UK model.

Key pressure points in the current pathways for clinician researchers

The Go8 has identified the following pressure points in the current informal pathways for clinician researchers that a more formal structure could and should address.

Supply of Clinician Researchers in specific disciplines

Feedback from Go8 institutions indicate that there are a number of specific disciplines in which clinician researchers are in particularly short supply:

- Psychiatry;
- Obstetrics and Gynaecology;
- General Practice;
- Surgery;
- Radiology;
- Pathology; and
- Clinical Pharmacology.

Note that this is not intended to be an exhaustive list of disciplines of in which clinician researchers are in short supply. Indeed, of the 23 specialties approved by COAG Health Council[25] only Physician (110), General Practice (79), Paediatrics and Child Health (83) had more than 60 registered medical practitioners in these specialties recording Researcher as their Job Role in the AIHW 2017 statistics[20].

Supply of specific skills/knowledge base in the clinician researcher population

With a future focus, the Go8 has identified the following skills/knowledge base shortages arising out of current clinical training pathways. These should be incorporated into the design of the clinician researcher training pipeline and, as a future initiative, separate training pathways should be developed in these key areas.

- Care of the elderly;
- Precision medicine;
- Implementation science;
- Genomics;
- Data science;
- **Digital health*;**
- Public health and epidemiology; and
- **Health systems research*.**

Again, this list is not intended to be exhaustive but rather points to future priority areas and also the need for a formal training program to support such a wide variety of skills and knowledge bases.

** These skills areas have been specifically identified by the Go8 Medical Research Roundtable of 4 December 2018 involving hospital CEOs and state health executives.[26]*

Career, employment and life factors for clinician researcher careers

Feedback during the development of this report has highlighted the following challenges faced by those aspiring to be future clinician researchers:

- Lack of clarity about the training and career pathway(s);
- Money and cost of living – disparity between training length and salary outcomes for a pure specialist career compared to a balanced clinical research/specialist career;
- Career pathways for life-partners;
- Limited-term (12 month) contracts in hospitals which make committing to a longer-term research training program difficult;
- Some Clinician Researchers may not receive their first fellowship until their mid-to-late 30s which makes a research career more challenging as other career/life demands take precedence;
- Limited Clinician Researcher lecturer/senior lecturer positions and insufficient protected time for research within these positions;
- Lack of opportunities for later career entry into research; and
- Lack of consideration of research track record *relative to opportunity* for researchers with a PhD and engaged in specialty training. This is particularly the case in the assessment of grant applications by these researchers and in the conferral of Early Career Researcher (ECR) status by funding agencies which brings with it access to additional research funding streams.

Engagement in the early stages of the clinician researcher career life-cycle

The Go8 has also identified that there should be formal/structured research engagement opportunities at the early stages of the clinician researcher career life-cycle. This should include:

- Medical school/pre-vocational medical training: career hypothesis testing – "is research for me?"; and
- Pre-PhD phase: preparation for research – developing a project proposal and research skills training.

Go8 recommendations for strengthening Australian clinical research

The Go8 presents a series of recommendations for strengthening Australian clinical research centred on the vision of an *Australian Integrated Clinician Researcher Training Pathway*. This involves setting national targets for the clinical research workforce, structured research programs during pre-vocational and vocational medical training with the end goal of producing PhD graduates (or equivalent) who move into a first postdoctoral research position, and other measures to support the full clinician researcher training life-cycle.

During the development of the recommendations that follow, there has been significant discussion about the optimal timing of undertaking a PhD (or equivalent). Given the duration of postgraduate training in Australia and the urgent need to grow the number of clinician researchers, whose research is informed by their clinical practice, the proposed pathway recommends that a PhD is completed during vocational training.

However, the MD/MBBS-PhD should continue to be an option for medical students in Australia and we must ensure that there are opportunities for these graduates to undertake post-doctoral research during their prevocational and vocational training. In addition, we recognize that some medical graduates may choose to undertake a PhD during pre-vocational training. Similarly, there should be opportunities for them to undertake post-doctoral research during their vocational training.

Underpinning these considerations, the Go8 has identified the following *design principles* for the training of clinician researchers.

General principles:

- **Clear –** the design of the training pathway and how to engage with it is transparent;
- **Flexible –** the training pathway can accommodate MD/MBBS-PhD graduates as well as those undertaking PhDs as in pre-vocational training, vocational training and post-vocational training phases of a medical career;
- **Attractive –** involves competitive funding and minimal delays to the completion of training of medical training.
- **Timely –** early opportunities to enter into clinician researcher pathways;
- **Managed –** the pathway should be nationally coordinated and actively managed at a local level; and
- **Supportive –** students and doctors in training should have access to consistent careers advice, supervision, mentors, and peer support.

National targets and monitoring clinician researcher staffing levels

In order for Australia to have a sustainable cohort of clinician researchers fit for the purpose of supporting the future national health system, analysis needs to be done to establish a benchmark for the size and specialty distribution needed. To support this target it is recommended that sub-targets are set for the percentage of medical graduates who enter into formal research training leading to a PhD (or equivalent) and importantly the percentage who have the opportunity to engage in a Clinician Researcher career through a first post as a research GP or research specialist.

International comparisons give some indication of the value of such targets. In England, 7.9% of medical graduates have access to an academic foundation program, 4.2% access to the academic clinical fellowship and 3.3% have access to a clinical lectureship subject to completing a PhD and enter into a post-doctoral clinical lectureship each year.[27] In the US, 3.3% of medical students complete an MD-PhD (the most common Clinician Researcher training route in the US) and of these 52.4% of these go on to take a full-time faculty position at a university.[28]

In the Australian context, analysis of the Australian National Health Workforce Data Set indicates that in 2017 there were 1305 medical practitioners who nominated their principal job area as research or education under the age of 55. To simply maintain this number in 2027 - assuming no other attrition from the cohort other than ageing – would

require an additional 458 medical practitioners entering these fields, approximately 1.5% of the domestic medical degree completions each year.[29]

While benchmarks will need to be refined over time, the Go8 anticipates that 5% of medical graduates are needed to enter a research training pathway and there needs to be post-vocational/PhD appointments and other funding opportunities to accommodate at least 3% who are committed to a career as a clinician researcher following completion of both a PhD (or equivalent) and vocational training.

In tracking progress against these benchmarks Australia will also need more granular tracking of clinician researcher numbers. One exemplar of such tracking is the annual survey of medical clinical academic staffing levels conducted by the UK Medical Schools Council which reports on clinician researchers working in UK Medical Schools including by institution, level of appointment, specialty and many other characteristics.[30]

Recommendations

1. The Go8 recommends that the following initial targets are established:
    - There are positions for least 5% of medical graduates to enter a research training pathway leading to a PhD each year; and
    - There are GP or specialist positions that have a research component or other funding opportunities for research each year for at least 3% of medical graduates when they complete vocational training.

2. That Australia establishes a national target for the number of clinician researchers required to support Australia's future health system across each specialty and research area and continues to monitor these targets.

3. That a survey of clinician researchers at Australian medical schools be established to inform planning and future target setting. This should be similar to the annual survey run by the UK Medical Schools Council.

An Australian Integrated Clinician Researcher Training Pathway (AICRTP)

The Go8 proposed Australian Integrated Clinician Researcher Training Pathway (AICRTP) at its core draws heavily on the UK's National Institute for Health Research (NIHR) through the Integrated Academic Training Pathway (IAT). This is a suitable model to be adapted for Australia due to the similarity of the health and education systems in the UK – particularly with the emphasis on PhD training during vocational medical training – and the success of the UK IAT in bulwarking the UK clinical academic population.

To be effective an AICRTP must be flexible and have multiple points of entry and exit as evidenced by the diagrams in the Appendix. For the sake of a coherent exposition the AICRTP recommendations will, however, be presented linearly in the discussion that follows.

Medical Schools

By the end of medical school, all medical students should be research literate. The AMC defines the outcomes expected of graduates, which include, "Demonstrate a commitment to excellence, evidence-based practice and the generation of new scientific knowledge."[31] It is vital that medical schools continue to promote the importance of research and equip the next generation with the skills they need to use research to improve patient care and contribute to new research.

Medical schools also play a key role in helping to identify and nurture future research leaders. Clinician researchers serve as critical role models to encourage medical students to consider a career in clinical research. It is important that medical students continue to be taught by clinician researchers, who are able to draw upon both their clinical and

research experience and expertise. In addition, there should be events to showcase the range of research opportunities available to students.

Medical students should have opportunities to engage in research. This includes lab-based, translational and population-based research. Most medical schools offer students opportunities to undertake research projects either as part of the medical program or as an additional option. These options should be safeguarded.

Some medical students may wish to undertake a research higher degree e.g. PhD. This is a valuable experience for some students and, with appropriate support and nurturing during postgraduate training, can be a springboard for a career as a clinician researcher. However, the majority of future clinician researchers may wish to wait until they have more clinical experience before undertaking a research higher degree i.e. during vocational training (see below).

Recommendations

4. That medical students should continue to have the opportunities to undertake degree involving or with exposure to research e.g. an honours year or a Masters and these should be incentivised through the provision of scholarships..
5. That a limited number of structured MBBS/MD-PhD programs should be developed or maintained and formally supported through the provision of scholarships.

Internship and Prevocational Training

The internship year and, typically, the second year of postgraduate training provide a bridge between medical school and specialist (vocational) training. During this phase, medical graduates consolidate their clinical skills, as they incrementally take on more responsibility for patient care, under supervision. At the same time, they test career hypotheses ahead of applying for vocational training.

To attract and nurture the next generation of clinical research leaders, there should be opportunities during this early phase of training for newly qualified doctors to explore whether a career as a clinician researcher would be a good fit for them. There is also a need to provide opportunities for those medical graduates, who have completed or are still undertaking a research degree to continue with their research at the same time as developing their clinical skills.

Medical graduates must successfully complete an internship to become generally registered with the Medical Board of Australia[32]. The total duration of internship training must be 47 weeks (FTE) and include terms of at least 10 weeks in both medicine and surgery and at least 8 weeks in emergency medical care.

There are proposals to require all Australian medical graduates to complete a two-year transitional program prior to entering vocational training[33]. COAG Health Council has accepted the recommendation from the Medical Intern Review to move towards an integrated, two-year transition to practice model incorporating the current internship year and PGY2 and the AMC has been tasked with advising on next steps. In practice, most graduates complete at least years two years of prevocational training before entering specialty training and medical graduates entering their internship in New South Wales are currently offered two-year employment contracts.

Mindful of the proposed direction of travel and recognising the need to ensure that graduates have further opportunities to explore a research career in the early years of their postgraduate training, we recommend that there should be an ***Integrated Clinician Researcher Transition Program*** of two years in duration. These competitive two-year programs should be managed in partnership by health services and universities.

They should enable graduates to:

- Meet the requirements for successful completion of the internship year and any requirements for PGY2;
- Explore a range of clinical and research training opportunities to inform their future career plans; and
- Undertake a meaningful research project or activities.

The meaningful research opportunities will typically be weighted towards the second postgraduate year. However, there should be opportunities for interns to either develop a research proposal and begin to become a member of the clinical research team or continue their research activities from medical school during the intern year without impacting on the need to focus on internship requirements. The PGY2 research placement could be offered either as a discrete block, e.g. 4 months, or as a longitudinal experience throughout the year, e.g. 1-2 days per week.

The recruitment to the integrated researcher transitional program should be aligned to state-based internship recruitment rounds. Both health services and the universities should be involved in the selection of these research trainees. Once enrolled in the Integrated Clinician Researcher Transition Program, interns should be assigned a research supervisor to help them plan and get the most out of their research placement.

Alternatively, stand-alone research PGY2 opportunities could be developed to provide medical graduates with opportunities to gain early research experience. These could be nested within one-year appointments and offered (as above) either as a discrete block, e.g. 4 months, or as a longitudinal experience throughout the year, e.g. 1-2 days per week.

As noted above, some medical graduates may choose to undertake a PhD during their prevocational training. These graduates will benefit from formal post-doctoral research opportunities integrated with their vocational training.

Recommendation

6. That universities and health services should offer research training opportunities, through an *Integrated Clinician Researcher Transition Program* in the first two years of postgraduate training. These should incorporate at least 5% of internship positions each year, be managed in partnership by health services and universities and allocated through a competitive process aligned with state-based internship recruitment rounds.

Vocational Training

The central recommendations from this report relate to vocational training. While we recognise that some may wish to undertake a PhD at medical school, some during pre-vocational training and others later in their career, vocational training is likely to be the optimal time for most to undertake a clinically-focused PhD or equivalent. This is the time when doctors in training will have at least some specialty or sub-specialty experience.

The exact timing of a PhD will vary depending on the nature and length of specialty-specific vocational training. To succeed both clinically and academically, vocational trainees must have dedicated time to develop both their specialist and research confidence and competence. Where possible, clinical and research training should be provided concurrently so trainees can maintain currency in both domains. As is currently the case, research training and completion of a PhD should count towards the minimum time required to complete specialist training. There may be scope for additional cross-recognition allowing clinical research trainees who demonstrate the appropriate level of competence to complete clinical training in a shorter period of time.

To ensure that doctors completing specialist training are competitive for both research (including fellowships) and clinical appointments, they should have sufficient time to complete a PhD and post-doctoral research. This will enable them to begin to develop their own portfolio of clinical research and position themselves as a lead investigator.

In addition, to maximise vocational trainees' chances of successfully securing a PhD scholarship and completing, opportunities should be provided early in vocational training to develop their proposal and complete formal research training e.g. research methods and biostatistics. The experience in the UK tells us that setting up a scheme that supports these opportunities is both attractive and increases the rate of successful completions of PhDs.[34]

To achieve all of these goals, the Go8 recommends a three-phase model to integrate research and vocational training:

1. ***Clinician Research Registrar*** **-** to develop research skills and a competitive Higher Degree by Research application;
2. ***Studentship*** – to undertake and complete a PhD (or equivalent); and
3. ***Senior Clinician Research Registrar –*** to undertake post-doctoral research while completing specialist training.

It is critical that there is flexibility and that vocational trainees can move in and out of the pathway. For example, vocational trainees who are not clinical research registrars should continue to be eligible to apply for PhD scholarships. The characteristics of the three stages of the model are set out below.

The Clinician Research Registrar phase is designed to help vocational trainees develop research skills and a competitive PhD application. This phase will typically last two to three years and provide trainees with at least a day a week (or equivalent e.g. 2-3 months each year) for research training. Universities/Research Institutes should assign clinical research registrars with a research supervisor and a mentor. Clinical Research Registrars should have access to funded opportunities for research training and they should be supported to develop a PhD proposal.

To secure the next generation of research leaders, at least 5% of vocational training positions each year should be assigned to the Australian integrated clinical research pathway. This means that for every 20 vocational training positions offered in each specialty grouping, at least one should be for a clinical research registrar. For some specialties and in some locations, it will take time to build a critical mass of quality research supervision to enable this.

Appointment to a clinical research registrar position should be through a nationally coordinated competitive process bringing together the specialist colleges, universities and health services. Successful appointees will typically become clinical research registrars in their first or second year of vocational training. To ensure that future research is aligned to subspecialty choice, this means that mechanisms will need to be developed to conditionally appoint to sub-specialty training at the point of entry. This will be important where vocational training is divided into basic and advanced.

During this early stage of vocational training, the clinical research registrar will apply for funding to undertake a PhD or equivalent. Those who choose to continue and are successful in securing funding will progress into a PhD studentship. Other trainees may choose to exit the formal research training pathway and return to vocational training subject to satisfactory clinical progress.

The studentship phase provides the research trainee a stipend and other funding to undertake a PhD or equivalent. This phase will typically last three years but occasionally may require four years. The trainees will be enrolled in a University and, where possible, opportunities should be provided for ongoing clinical training of around one day per week. This is particularly important towards the end of the PhD studentship. It is critical that there are sufficient PhD scholarships and other sources of funding for at least 5% of medical graduates to ensure that there is a continuous supply. To ensure that the research pathway is attractive, the stipend or salary support should be comparable to the basic registrar salary.

Following successful completion of a PhD or equivalent, researchers should progress into **senior clinician research registrar phase**. Trainees should apply for senior clinician research registrar positions in the final year of their PhD with appointment conditional on successful completion. Senior Clinician Research Registrar positions should typically allow trainees to spend 50% of their time undertaking post-doctoral research and 50% of their time to complete their vocational/fellowship training. This phase should provide a platform for the trainee to develop their academic skills (including teaching), advance their reputation as an independent researcher, publish the outcomes of their research, and prepare grant applications or apply for a senior lecturer/senior research fellow or equivalent position.

The senior clinician research registrar positions should be managed in partnership between universities, research institutes, health services, specialist colleges and funding agencies. They should typically last no longer than 4 years and culminate in completion of vocational/fellowship training.

It may not be possible to complete a PhD and substantial post-doctoral research as a senior clinician research registrar in specialties with shorter vocational training programs like general practice and rural generalism. For these specialties it may be more appropriate to offer clinical lectureships following completion of vocational training for early career general practitioners and rural generalists. These should be offered in partnership by universities, the relevant specialist college and funding agencies.

There must also be a pathway for MD/MBBS-PhD graduates to enable them to continue to undertake post-doctoral research during vocational training as well as a pathway for those who complete a PhD during pre-vocational training. The clinician research registrar / senior clinician research registrar phases could be adapted to accommodate these exceptional graduates.

While PhD training is the primary research training mechanism suggested in the AICRTP it is important that the system also includes the flexibility to allow clinician researchers with formal research education and training equivalent to a PhD to have access to subsequent phases e.g. Senior Clinician Research registrar. These equivalent routes may include professional doctorates, or combinations of formal qualifications and supervised team-based research training. Accommodating these pathways in the AICRTP acknowledges that there are disparate routes to research in the health sector and the need to nurture future talented knowledge translators.

Recommendations

7. The establishment of a formal three-phase *Integrated Clinician Researcher Vocational Training Program*:
   - ***Clinician Research Registrar phase to develop research skills and competitive Higher Degree by Research application.***
   - ***Studentship to complete a PhD (or equivalent).***
   - ***Senior Clinician Research Registrar phase to undertake post-doctoral research, complete vocational/fellowship training and prepare for their first specialist/GP appointment involving clinical research. These positions would be open to researchers with formal research education and training judged equivalent to a PhD.***
8. At least 5% of vocational training positions should be included in the Integrated Clinician Researcher Vocational Training Program.
9. There should be pay parity with the registrar pay scale for appointees to the Integrated Clinician Researcher Vocational Training Program. This should include PhD/research fellowship scholarships or equivalent.

Post-vocational opportunities

The Go8 have developed the proposed Australian Integrated Clinical Research Training Pathway to safeguard a continual supply of medically qualified research leaders. It is critical that there are attractive employment opportunities for those who have completed their vocational and research training and have an emerging portfolio of post-doctoral research. The range of opportunities should include senior clinical lectureships and fellowship awards.

This is a critical transition in the life of a clinician researcher as they begin to establish themselves as an independent researcher. Start-up funding will need to be made available and appointees offered a mentor.

Recommendations

10. Universities and research institutes continue to invest in senior lecturer/research fellow level positions, which are suitable for recently qualified GPs and specialists with relevant post-doctoral experience
11. Research funding agencies grow the number of early career awards and target these at newly qualified specialists and GPs. The fellowship should be used to also grow medical research capacity in specialties that are historically underserved.

Other critical enablers

The Go8 believes that mentoring should be provided at all points of the clinician researcher training life-cycle which should be a combined effort of stakeholders including universities, health services, Specialist Colleges and peak bodies.

There are already examples of effective mentoring programs that could be built upon including the Australian Academy of Health and Medical Sciences Mentorship Program[35].

Parties will need to actively promote the Australian Integrated Clinician Researcher Training Pathway. This should include research showcase events, the development and maintenance of a clinical research careers website and support for medical school and/or specialist trainee research societies.

It is a key part of the training of all medical specialists that they are research literate and where possible participate in research. Indeed, the Australian Medical Council standards for specialist medical training makes this explicit:

The curriculum includes formal learning about research methodology, critical appraisal of literature, scientific data and evidence-based practice, so that all trainees are research literate. The program encourages trainees to participate in research. Appropriate candidates can enter research training during specialist medical training and receive appropriate credit towards completion of specialist training.[36]

Where a Higher Degree by Research is undertaken by a medical graduate – either pre-specialisation or as part of specialist training – it is important that this is in alignment with career goals. Investing the time and effort to complete a PhD, without the intention to follow a research active career, is not only a loss to the research system but can also increase, unnecessarily the cost and duration of postgraduate training. It is likely that the driver for some medical graduates to complete a research degree is the competitiveness of specialist training programs.[37]

To ensure a proportionate approach to research training, the Go8 believes that there is merit in specialist colleges, health services, universities and research institutes working together to target opportunities to medical students and graduates who are likely to be the future Clinician Researchers. This should include a review of the criteria for entry into vocational and fellowship training as well as the position descriptions for GP and specialist roles to ensure that a PhD is seen primarily as a pathway to a research active career.

Recommendations

12. That mentoring scheme(s) be established for participants in the clinician researcher training pathway as a combined effort of universities, health services, specialist colleges and peak bodies.
13. Universities, research institutes, funding agencies, health services, specialist colleges and peak bodies should actively promote clinical research careers to medical students and doctors. This should include a clinician researcher careers website, showcase events and extra-curricular opportunities to participate in research during medical school.
14. Specialist colleges, health services, universities and research institutes work together to target research training opportunities to medical students and graduates who are likely to be the future clinician researchers. This should include a review of the criteria for entry into vocational and fellowship training as well as the position descriptions for GP and specialist roles to ensure that a PhD is seen primarily as a pathway to a research active career.

Beyond medically qualified clinician researchers

This report has focussed on medically qualified clinician researchers as a critical component of Australia's health workforce. This cohort is part of a broader workforce of clinician researchers and educators that includes nurses and Allied Health professionals

In this context, the Go8 views the creation of the Australian Integrated Clinician Researcher Training Pathway as a first realistic step in creating formal training and career pathways for nurse and allied health professional researchers as well as clinician educators.

This need for a broader perspective has been raised in consultations during the drafting of this report by many stakeholders both internal and external to the Go8. In particular, it was a focus of discussions at the Go8 Medical Research Roundtable in December 2018[26].

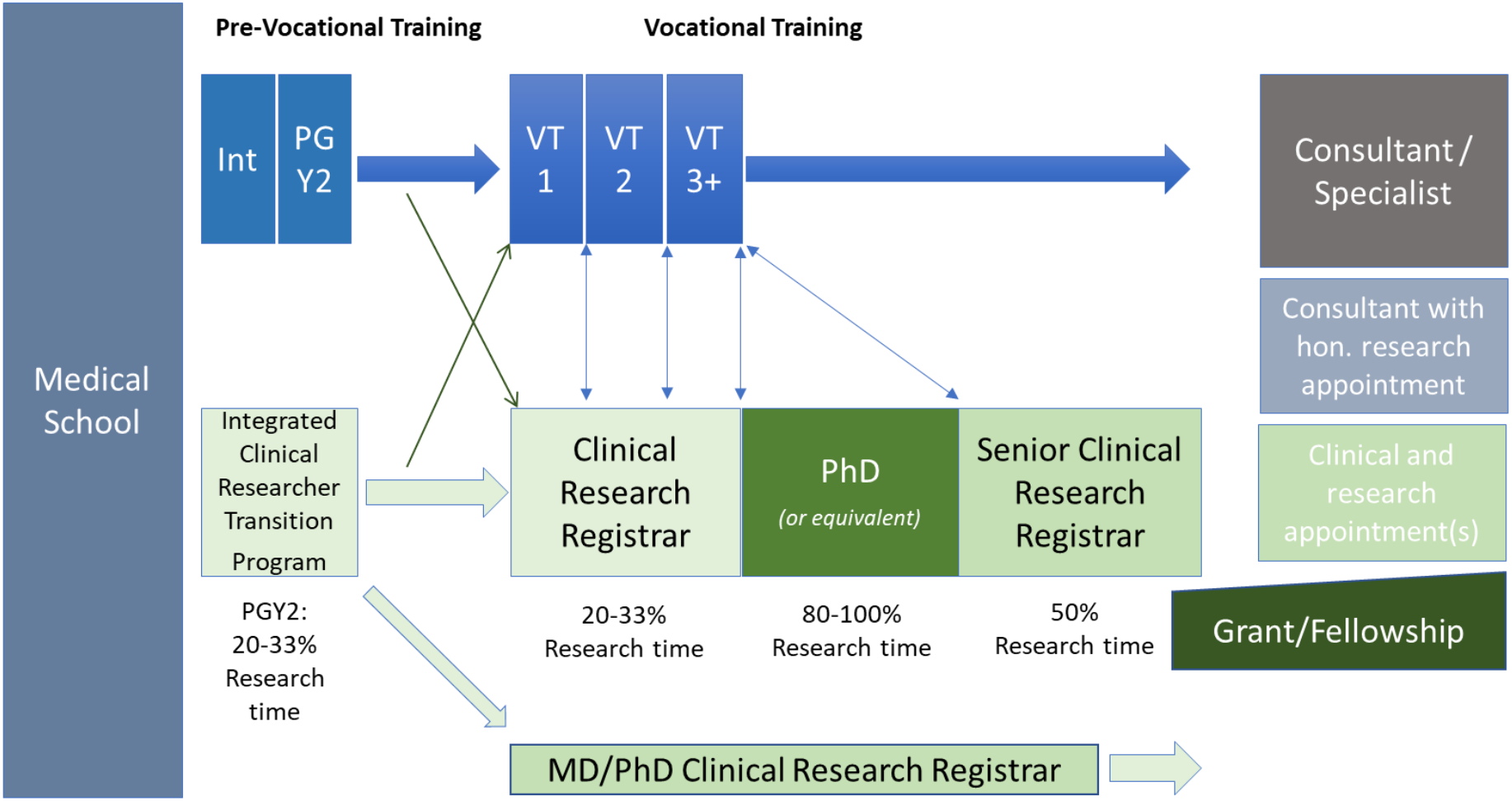
The UK Clinical Academic Careers Framework[38] provides a model in this regard.

Recommendation

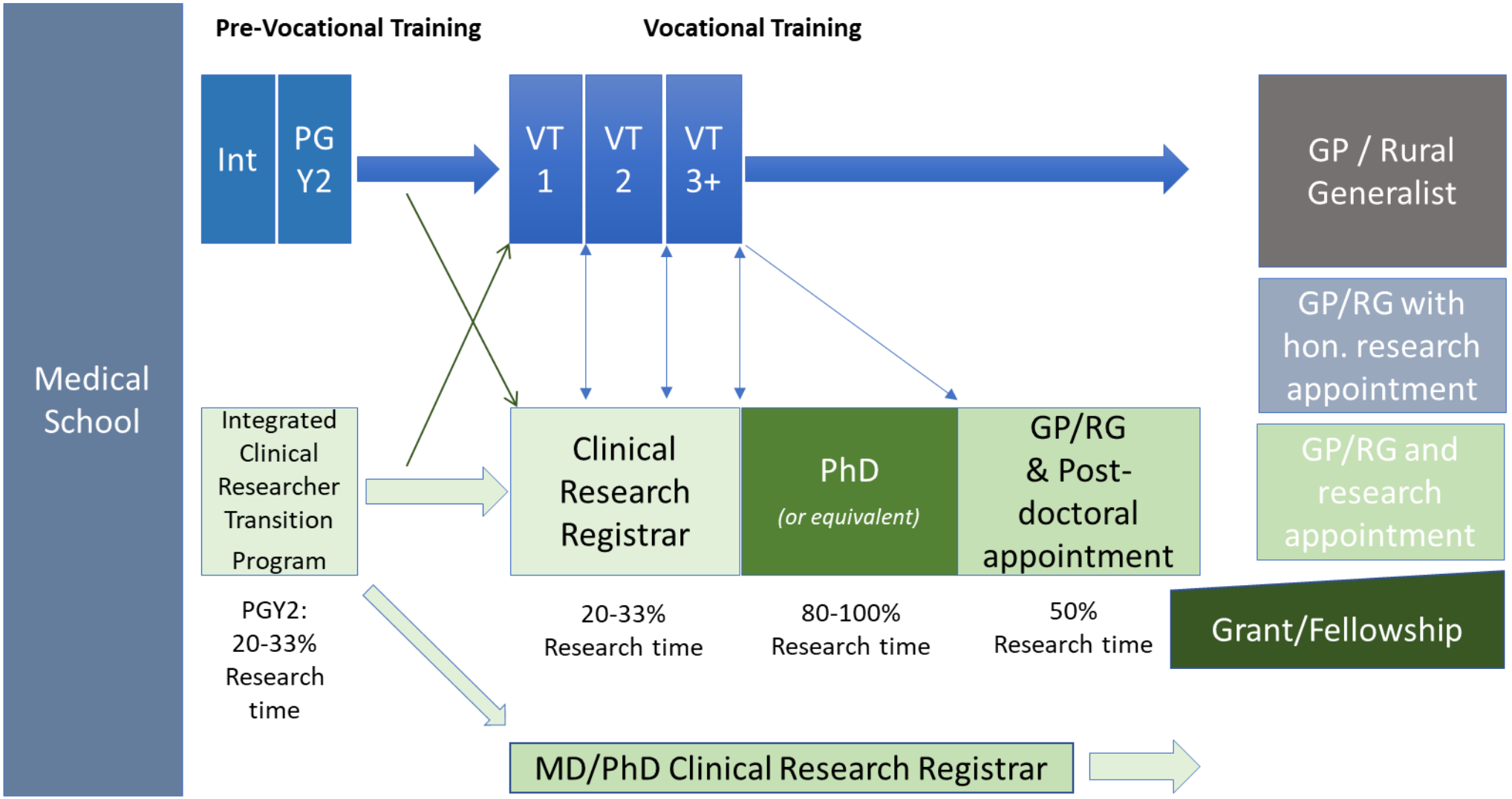
15. Following the establishment of the Australian Integrated Clinician Researcher Training Pathway (Medical) an expanded or parallel program(s) be established to support the training of nursing and allied health professional researchers. In addition, the training pathways should also be adapted to develop clinician educators.

Appendix: Structure of the proposed AICRTP

Proposed Australian Clinical Research Leader Training Pathway (Specialist)



Proposed Australian Clinical Research Leader Training Pathway (General Practice and Rural Generalist)



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