Government of Western Australia
Department of Health
South Metropolitan Area Health Service

Royal Perth Hospital
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Research Administration and Governance

Director of Research

Submission
Strategic Review of Health and Medical Research

Royal Perth Hospital (RPH) is Perth's oldest and largest public teaching hospital, situated on two campuses, with approximately 900 beds. There are over a 150 clinical trials ongoing at any one time and a substantive range of discovery research performed by investigators affiliated with RPH, but also and most significantly, with the University of Western Australia and the Western Australian Institute for Medical Research (WAIMR). Thus, it is a stimulating place to do research in the context of a high quality tertiary hospital care facility.

Why is it in Australia's interest to have a viable, internationally competitive health and medical research (HMR) sector?

- ***High quality health outcomes have a strong foundation of research*** - Evidence from around the globe indicates that those institutions that deliver the highest quality health outcomes to the community are invariably underpinned by a vibrant, integrated, focused, internationally recognized and competitive HMR sector (eg Johns Hopkins in Baltimore, Imperial Health Care [former Imperial College] in London, Duke University Medical Centre in Durham, Toronto Children's Hospital in Canada). The more integrated the research culture and programs become into the standard delivery of care, both within the tertiary and primary care arenas, the better the outcomes for health and wealth of the community.
- ***A prominent and integrated research culture attracts the best and brightest*** – An integrated research culture that has preventive health, epidemiology, discovery science with cutting edge technology and infrastructure together with clinical translation research (clinical trials) attracts the best clinicians and scientists like bees to a honey pot, brings the best teachers and produces the best young doctors and allied health practitioners who are provided with the best opportunities for undergraduate and post-graduate research. It is a virtuous cycle – and it works. These high quality destinations continue to attract and then sometimes prevent our brightest and best scientific minds from returning to Australia.
- ***Having a viable HMR sector is a sound long-term investment for Australia*** – for every dollar invested in HMR, there is a return of $2.17. (Access Economics, 2008).
- ***A viable HMR industry provides jobs*** – it is a major employer of at least 10,000 people across the country, and makes a substantial contribution to the economic wealth of the country.
- ***A viable HMR sector drives improved translational outcomes*** – it encourages participation in clinical trials and increases the opportunity for the Australian community to be exposed to new medicines first, potentially years before the rest of the world (see below for more on translational research).
- ***A viable HMR sector ensures that Australia can "have a seat at the table"*** – we can be an important contributor for some of the large collaborative global research initiatives, such as sequencing the cancer genome (pancreatic cancer), generation of global tissue banks (eg melanoma), participation and being the lead nation of specific clinical trials (eg vaccination, lipid lowering agents) – ensuring rapid translation of outcomes into the clinic.

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- ***A viable Australian HMR sector will ensure we maximize use of our significant assets to offer the global community*** – these include, for example, Australia's highly curated long-term clinical databases (eg Busselton, Dubbo, Victorian cancer consortium, melanoma databases, CVS disease, stroke etc). These are relatively underutilized globally and provide a rich resource for collaboration and for potential investment by the pharmaceutical industry.

How might health and medical research be best managed and funded in Australia?

- ***Current funding for HMR in Australia is complex*** – it is a mix of federal (NHMRC, public hospital), state (public hospital and some other initiatives), not-for-profit (Cancer Council, National Heart Foundation, National Breast Cancer Foundation, Prostate Cancer Foundation of Australia, various Societies and Foundations [eg RACP, RACS]), Universities, MRIs, corporate sector, pharmaceutical industry and others. This mix makes it challenging to implement an overarching strategy across all sectors.
- ***The NHMRC is still the best positioned organization to lead the major federal funding and investment in HMR in Australia -*** the NHMRC does have good general governance systems in place which enables it to carry out its major role as a funds provider and distributor. Although it does list several priority areas, these appear somewhat reactionary rather than part of a cohesive broader vision for the nation's HMR into the next decade.
- ***The Australian HMR sector needs strategic leadership at the national level –*** the NHMRC has traditionally not played a major role to set the HMR agenda for the nation and provide a global vision for the sector. If the NHMRC is going to take on this more strategic role, it can't do this alone, and Australian Association of Medical Research Instituttes (AAMRI), the research intensive universities, the various health industry partners together with key industry leaders will need to be centrally involved in this conversation to develop an Australian HMR "road-map" (see below).

  This would require NHMRC to significantly expand its role to provide more strategic leadership. The NIH provides one model of strategic leadership. It supports research (people, projects, programs and infrastructure), establishes new strategic initiatives and funds them and also plays a key role to set the national strategic goals agenda for medium and long-term investment, providing a clear "road-map" and a big vision for the nation (http://commonfund.nih.gov/aboutroadmap.aspx). Importantly, the US, and the UK have shown through the NIH and affiliated organisations that ***it is possible*** to get agreement on large overarching strategic issues and then tailor funding schemes and initiatives to match. This sort of leadership is urgently required if we are going to maintain a HMR sector that can collaborate and compete with Asia, Europe and the US, and most importantly continue to produce substantive health and wealth outcomes for the community.
- ***Funding for HMR in Australia in relation to GDP is low on the global stage*** - The sector, led by NHMRC and other peak industry and research bodies, such as AAMRI, ASMR, Research Australia and others must work together to secure a significant increase in government and other industry/organization funding. Australia is falling behind many other countries in terms of real investment in HMR (<u>we are actively slipping down the OECD league table of comparative investment</u> –**now ~0.09% of GDP, OECD average = 0.11% and the US 0.31%).** To capitalise on the associated health and wealth benefits of HMR, ***we need to rise to near the top of the pack with an investment of at least 1.5% of the federal health budget in the next 20 years.*** It seems inconceivable that the country that rode out the GFC arguably better than any other in the world, and with well over $150b of resource-based investments underway in its north, a very high standard of living and low unemployment, is lagging badly behind the other OECD countries in this key investment metric.

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- ***We need improved strategies to survive the "valley of death" and a coordinated approach to commercialization.*** There needs to be increased collaboration with Australian and offshore industry to promote commercialization of Australian HMR innovations. We are known for our innovation (vaccines, blood factor replacement, bionic ear etc), but also for our poor translation of many of these outstanding inventions into meaningful commercial and clinical outcomes. We need to establish much more robust mechanisms to overcome the well known "valley of death" – the funding landscape which researchers hit with new discoveries where there is new IP of potential worth, but very few options for how to progress the invention when most of the usual funding schemes are considered inappropriate. ***If we are to significantly increase the net wealth emanating from our collective innovation, the nation must evolve a strategy to invest more in these early stage inventions,*** be prepared to back multiple potential winners in the knowledge that one success will be surrounded by many failures. We need, for example, to be educated by the enthusiasm and track record of success in the academic HMR universities and institutes in ***Israel. They have a "can-do" mentality.*** They have a savvy investment culture for "start-ups", strong support at government level and a very successful track record of generating substantial wealth in the sector.
- ***We need to be less risk averse for some of our national investments*** - We need new schemes that will fund "high risk high gain" projects with a rapid turn around time of reviewing. Similar schemes operate in other countries very effectively, and provide a much more responsive research environment for exploration of extremely novel ideas. Currently, if you have a novel idea on the day after the NHMRC grants are submitted in any particular year, in real terms there is no funding likely for at least 21 months. This is untenable in the global science climate, where speed of discovery, and therefore identification of novel IP, is of great importance.

What are the health and medical research strategic directions and priorities and how might we meet them?

- The epidemics of ***diabetes/obesity/cardiovascular disease, mental health disorders and cancer*** will comprise the major health burden for Australia in the first half of the 21st century. Significant investment already flows into each of these areas from multiple sources. However, it is not strategic for the most part, nor is it part of an overall national plan and vision for how we might tackle and solve these problems. Significant additional coordinated investment into each of these areas with a substantial translational emphasis, including an ***emphasis on the complex issues confronting health in the indigenous community, should be a high priority. The value of preventive health, and interventions in those at risk*** should not be underestimated. Similarly, the community has to play a key role in driving some of these initiatives.
- ***We need to be at the global table for maximizing collaborative investment*** in these key areas to ensure that our strengths are seen to be complementing, rather than duplicating, the global skill sets. That will stem from being a very active participant in global health initiatives.
- We need to ***further promote (and protect) innovative, curiosity-driven, discovery-based research*** and appreciate that the new knowledge generated is of great value. As translational research becomes the "catch phrase" for increased investment, ***it must NOT be at the expense of investigator-initiated discovery research***, from which much of our truly novel, and at times commercially relevant, discoveries have emanated from.
- ***We need a more stable career structure for young scientists***. There are often few choices for early to mid-career scientists, the NHMRC system being extremely competitive and with limited numbers, the university system often difficult to get into, swamped with

teaching and may not provide the background for high quality research outcomes. ***Increased investment MUST flow into this part of the HMR sector,*** otherwise we risk losing a generation of young scientists to other countries and/or into the community where their finely honed skills are often completely wasted. This could take the form of an expansion of the NHMRC Career Development Award type system, or a new system set up to cater even earlier in their post-doctoral careers.

- ***We need to equip the country for the age of informatics*** and devise new courses that integrate high-end statistics/mathematics into almost every aspect of their learning. The science student of the future should be versed in these areas so that they can confidently traverse the complex information oceans of future knowledge. The medical student of the future will also need to be equipped with some additional skills in these areas. Take, for example, the challenge confronting pathology at present. Massive amounts of molecular and informatics data is about to populate their environments – however there are few tools available to deal with the tsunami of information, let alone distil it into useful clinically relevant small pieces for use at the bedside. New ways of dealing with this information explosion will need to be generated and we need to be part, rather than an observer, of that solution.
- Australia needs to develop strategies ***to increase the number of physician-scientists involved in research.*** This breed of clinician, if well trained in research, can bring a broad perspective to the clinical questions to be asked and should be able to ensure that translational studies are pertinent, the methods taken to address them are sound and relevant for translating the new knowledge into practice. A strong HMR sector should comprise a healthy proportion of physician-scientists (maybe around 10%), a significant increase on the number at present. Various funding initiatives need to be developed to fund these individuals (eg. Practitioner Fellowships, and other clinical Fellowships, PhD stipends etc). The hospital sector also needs to understand the importance of maintaining such individuals in the hospital system and for their contribution to clinical care.

How can we optimize translation of health and medical research into better health and wellbeing?

- ***Defining "translational research" can be challenging,*** *but if it is limited here to clinical trials and the translation of that knowledge to the medical and broader community, then optimal translation still requires an appreciation of the complexity of this task.*

- Initiatives to optimize translation include the need for:
    - A ***clinical environment that is pro-research*** (not solely service based), and understands the requirements and infrastructure required.
    - ***Provision of increased clinical research positions within the organization (eg Practitioner Fellowship type positions) = time for clinical research***. For example, the Foundation at RPH recently made available 3 x up to 0.5 FTE Clinical Research Practitioner Fellowships. They were hotly sought after and we could have awarded, funds willing, many more. These sorts of positions need to become much more common, so that this translational gap can be traversed much more easily. The rewards are very significant, for the physician, the hospital, the community and the research sector. However, when funds are scarce, these positions are often the first to go.
    - High quality clinician-scientists who are active in clinical trials, and are given the ***time away from service to drive the trials***.
    - ***Excellent hospital/institution research governance, which is fast and efficient, including a smoother more streamlined ethics process,*** that also speeds up recruiting.

- Appreciation of the real costs of clinical research and provision of key infrastructure, including access to biostatisticians, tissue banking, trial coordinators.
- Integration of ***evidence-based translational research learning modules (ie Good Clinical Practice, GCP)*** into both undergraduate and postgraduate teaching, with an agreed level of accreditation.
- Quality linkages between the teaching hospital sector and committed general practice to ensure that hospital-based advances are conveyed to the community.
- High quality links between health providers, the media and community to ensure that a more robust educational and preventive network is established and advertised.
- Time for clinicians to be educated at meetings (national and international) and other events which will allow them to make informed decisions about new treatments, new approaches to human disease and facilitate translation of new findings actually into their day to day clinical practice (which we know is actually very difficult to change in practice).
- ***Establishment and funding of several Academic Health Science Centres (AHSCs) in key locations across Australia.*** These are large collaborative ventures between research-orientated hospitals, research intensive universities and MRIs that represent a coalescence of like minds with a similar long-term that focus – an integrated facility that delivers high quality healthcare and high quality teaching and research. Successful execution of these Centres can be excellent for the community, patients and staff. Multiple examples exist around the world (eg Imperial Health Care, London), and Australia is actively beginning to take on this model in some centres. The UK has recently decided to fund several AHSCs and establish them as a foundational component of their public health system.

Should you wish to discuss any aspects of the above, I am very happy to do so.

With kind regards

Winthrop Professor Peter Leedman
Director of Research
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