The science of integrative medicine

NICM
FROM THE DIRECTOR

Demand for integrative approaches to healthcare, which focus on individual care and combine the best of conventional medicine and evidence-based complementary medicine and therapies continues to grow worldwide. Australians are among the world’s highest users with an annual expenditure of $3.9 billion, and predicted growth by 2021-22 reaching $4.4 billion.\(^1\) With such high use and growth, there remains an ethical and scientific need to conduct independent research into the potential benefits and limitations of integrative medicine to improve public health and safety.

Seed funded by the Commonwealth and New South Wales State Governments in 2007, NICM has become one of the world’s largest integrative medicine research concentrations and Australia’s leader in natural and traditional medicine research and policy development.

In 2017, we celebrate our 10th anniversary. Consistent with our enduring mission and vision, throughout this time we have advanced the evidence base for integrative medicine, helped build capacity, fostered novel and innovative approaches to research and attracted further investment in integrative medicine research.

Awarded the highest rating possible from the Australian Government with our research confirmed as “well-above world standard”,\(^2,3\) we are recognised nationally and internationally for our scientific capabilities and advice which is driving the development of innovations that make a vital contribution to the rapidly expanding integrative medicines sector and industry.

Inspired by the promise and challenge of the future, we look forward to continuing our scientific advances and making a real difference to the lives of the communities we serve.

Professor Alan Bensoussan

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VISION, MISSION AND VALUES

Vision
Assist in the evolution of healthcare with the use of evidence-based integrative medicine.

Mission
Conduct research that advances our knowledge and understanding of natural and traditional medicine and promotes evidence-based integrative healthcare.

Values
We embrace three core values that are the foundation upon which we continue to build our Institute and its future success. These values are:

- **Wellbeing**
  We empower people with their own wellbeing through scientific evidence and informed choice.

- **Making a difference**
  Through our shared values, we are committed as a team to making a difference in integrative medicine. Our strategic alliances and collaborative achievements result in continuous learning and long-term impact.

- **Global leadership**
  Through rigorous scientific investigation and innovation, we strengthen our global reputation in research excellence, and build capacity as a powerful advocate of evidence-based natural and traditional medicine.
FOUNDING OBJECTIVES

- Build capacity, foster excellence and attract increased investment in complementary medicine research
- Articulate national priorities in basic and translational research and promote national and international collaborations to support these, including between complementary and conventional health and medical research
- Facilitate translation of research effort into practice and policy, including appropriate integration with the conventional health system
- Work with national and international partners to identify and develop sources of accurate information and efficient mechanisms for sharing data and disseminating information about current research activity and evidence of safety, quality and efficacy of complementary medicine
- Provide advice on opportunities relevant to and issues affecting the complementary medicine research sector to build a policy, regulatory and industry environment conducive to research
- Collect data and communicate the strength and value of complementary medicine research

NICM is committed to social responsibility and the highest degree of integrity, ethics and scientific enquiry; our three core values are expressed every day in our relationships with our stakeholders and with each other.
Natural and traditional medicines are widely used around the world⁴ and in Australia remain one of the fastest growing areas of healthcare.⁵ The importance of evidence-based research in integrative medicine is underlined by its high-levels of use.

It has been estimated that more than 1.8 million Australians paid for alternative health services in a four-week period in 2014-2015.⁶ Yet, this use often occurs without a full understanding of the effectiveness or the benefits or limitations related to its use. Such high usage rates have also led to 70 per cent of medical practitioners expressing an interest in increasing their understanding of integrative medicine.⁷

By building on the wealth of traditional medical knowledge, scientific research allows us to create new knowledge and options for enhancing health and wellbeing.

Various natural and traditional medicines offer a wealth of potential healthcare solutions, backed by hundreds of years of clinical use. For example, some 2,500 years ago, the Chinese were using treatments made of mouldy soybean curd to treat infections; however, it was not until 1942 that Howard Florey and Ernst Chain developed the manufacturing process for penicillin, enabling the first antibiotics to be sold as drugs.

Many modern pharmaceuticals are derived from plants used in integrative medicine. Common examples include aspirin (from willow bark), the cardiac drug digoxin (from foxglove), quinine (from cinchona bark), and ephedrine (from ma huang, a widely used Chinese medicine).

It is vital for the health of all Australians that high-quality research is undertaken into the safety and efficacy of integrative medicine. In many cases complementary medicine interventions have been shown to be clinically effective, some with better safety profiles and greater cost-effectiveness than conventional care while others are of doubtful benefit.

⁶ Roy Morgan. (2015). Taking it as a complement: most alternative health consumers also visit the doctor (Press release)
Chronic diseases such as cardiovascular disease (including heart disease and stroke), dementia, mental illness (including depression) and cancer are among Australia’s national health priorities. These are Australia’s leading causes of death and disability. Nonetheless, existing medical treatments for these diseases may be inadequate, expensive or have significant side effects.

Natural and traditional medicine can make an effective contribution to the management of chronic disease and shows promise in the development of new treatments.

Evidence has shown many natural and traditional medicines to have excellent safety and efficacy profiles, providing advantages over current treatments.

Examples include:

- Artemisinin and avermectin research, awarded a Nobel Prize in 2015, has fundamentally changed the treatment of parasitic diseases such as malaria, river blindness and Lymphatic Filariasis. The global impact of the discoveries and the resulting benefit to humanity are immeasurable.

- Lutein and zeaxanthin for prevention of age-related macular degeneration.

- Calcium and vitamin D supplementation to prevent fractures and bone loss.

- Omega-3 fish oils (DHA, EPA) for secondary prevention of heart disease.

- St John’s wort for mild to moderate depression.

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8 AIHW. (2016). Australia’s health 2016. Australia’s health no. 15. Cat. no. AUS 199. Canberra: AIHW.
REDUCING THE BURDEN OF ILLNESS

Integrative medicine provides an opportunity to reduce healthcare costs through better disease prevention and more effective chronic disease management.

The burden of illness and increasing health costs in Australia presents a huge challenge for government, private health insurers and individuals. Australia currently spends 9.8 per cent of GDP on healthcare, which is predicted to increase with chronic medical conditions becoming increasingly common in Australia due to an increasing and ageing population, and social and lifestyle changes.

There is growing pressure to find solutions that will improve health outcomes and reduce healthcare expenditure. Utilisation and further development of high-quality, cost-effective, and safe complementary medicines provides an opportunity to reduce healthcare costs through better disease prevention and more effective chronic disease management.

Research enables the identification of effective integrative medicines which should be adopted for better healthcare, and conversely, ineffective integrative medicine which should not be promoted or used.

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UNRIVALLED RESEARCH

Healthy hearts: preventing and treating cardiovascular and metabolic disease

Healthy minds: preventing and treating neurocognitive and mental health disorders

Healthy women: promoting sexual and reproductive health

Healthy lives post-cancer: staying healthy through the cancer journey
NICM’s research is focused on some of the major diseases and illnesses that impact today’s society. Our clinical research at NICM concentrates in areas of national priority and global importance:

- Healthy hearts: preventing and treating cardiovascular and metabolic disease
- Healthy minds: preventing and treating neurocognitive and mental health disorders
- Healthy women: promoting sexual and reproductive health
- Healthy lives post-cancer: staying healthy through the cancer journey

Our scientists focus on the safety, efficacy and use of integrative medicine, and employ a diverse range of disciplines to investigate these issues. Scientific research into the clinical efficacy, safety, mechanisms of action and economic value of natural and traditional medicine is a relatively new endeavour. It spans the biomedical, clinical, social, economic and public health fields, creating a vibrant interdisciplinary context.

Drawing on its legacy of traditional knowledge, NICM’s research program investigates the breadth of interrelated issues in integrative medicine from the broad social research perspective to detailed analysis of the chemical constituents and molecular effects of herbal medicines. As a full service research-intensive institute we cover:

**Preclinical development**
Laboratory research on identification, bioactivity and mechanisms of action of herbal medicines and herb-drug interactions.

**Clinical development**
Essential to the development of new interventions, clinical research and trials validate the efficacy and safety, and the benefits or limitations, as well as any potential adverse effects related to use.

**Translational and policy**
Health policy research on issues such as safety, industry regulation, service provision and use of evidence-based integrative medicine, health policy development through federal and state government agencies, development of clinical practice guidelines and economic analysis of integrative medicine usage.

NICM provides a focal point for innovation and independent research for integrative medicine in Australia.
Our research in Australia is unrivalled. NICM is rated “well-above world standard” by the Australian Government’s Excellence in Research for Australia (ERA) process which provides tangible confirmation of the outstanding quality of our researchers, research outputs and reputation.\textsuperscript{17,18} The ERA 5 rating is the highest possible and a reflection of a high output collaborative research team that is driving innovation and advances for some of our greatest health challenges.

NICM’s world-class interdisciplinary researchers provide leadership in clinical research, with a track record for completing high-quality trials published in the world’s leading medical journals. International collaborations provide access to the world’s leading clinical experts and facilities.

Our state-of-the-art facilities offer herbal analysis and pharmacological laboratories and we utilise a wide range of instruments and advanced techniques such as a Nuclear Magnetic Resonance Spectroscopy, High Performance Mass Spectrometry and proteomics.

As one of the world’s largest integrative medicine facilities, NICM plays a major role in building capacity in the sector nationally and internationally.

Strong relationships built with key industry members and national associations (Complementary Medicines Australia and the Australian Self-Medication Industry) have also enabled NICM to help address issues of national importance such as:

- Helping consumers and health professionals choose safe and effective integrative medicines
- Growing a responsible and robust Australian industry with excellent export potential
- Capitalising on Australia’s research and manufacturing strengths
- Addressing the growing chronic disease burden

NICM provides policy leadership and advice to government on key issues related to improved patient safety and has been instrumental in the national regulation of traditional Chinese medicine practice.

Instrumental in building capacity and developing highly skilled researchers in the sector, we further strengthen Australia’s leadership and competitiveness in integrative medicine by fostering Australia’s next generation of world-class researchers through our Higher Degree Research program, scholarships and development of early-career researchers.

Perhaps most significant is our role in the translation of research into better health practice, and clinical research to develop the evidence base for integrative healthcare in Australia.

NICM continues to liaise with industry to develop a quality control platform for improving the standard of integrative medicine, particularly in the context of high-level therapeutic claims.
REDUCING MEDICAL INTERVENTIONS

- Professor Caroline Smith
- Dr Kate Levett
- Professor Hannah Dahlen

Significant research by NICM could lead to lower rates of medical interventions during childbirth such as instrumental birth and caesarean sections. NICM’s Professor Caroline Smith, Professor Hannah Dahlen and NICM PhD graduate Kate Levett conducted research that shows antenatal education classes focusing on pain relief techniques that include integrative medicine options dramatically reduce the rate of medical interventions.¹⁹

The research, the first of its kind, has been published online in the *British Medical Journal Open*. It raises questions about the way expecting mothers are provided childbirth education classes in Australia. High rates of medical interventions during childbirth are problematic as they can spark a ‘cascade of interventions’, and commonly result in instrumental birth or caesarean section.

To test whether childbirth education programs can help drive down the rate of medical interventions, researchers conducted a randomised controlled trial of 176 women having their first baby across two Sydney hospitals.

“This high-quality study was unique by providing for a composite number of complementary therapies into one program,” says Professor Smith.

“It strengthens current evidence of a supportive role from complementary medicine techniques, and may offer women additional options for managing pain in labour.”


TOWARDS A SAFER CHOICE

- Professor Alan Bensoussan
- Professor Stephen Myers

The Government commissioned review, *Towards a Safer Choice: the practice of traditional Chinese medicine in Australia*,²⁰ authored by NICM Director Professor Alan Bensoussan and Professor Stephen Myers has been instrumental in the national regulation of traditional Chinese medicine practitioners, keeping consumers safe and raising the profile of traditional Chinese medicine in Australia.

In 2012 Australia became the first Western nation to regulate traditional Chinese medicine practice – an outstanding example of NICM’s role in translational research in integrative medicine.

The review included a national workforce survey; an analysis of risks and benefits presented by the practice of Chinese medicine; analyses of educational programs and professional associations; a study of patients using Chinese medicine and a review of overseas and local regulatory approaches to better manage complementary medicine risks in practice.

In determining the potential regulatory options, the review included a detailed assessment of Chinese medicine practice against the Australian Health Ministers’ Advisory Council Criteria for Assessing the Need for Statutory Regulation of Unregulated Health Occupations.

Demand for integrative medicine is strong worldwide and increasing. The World Health Organization has recognised this trend and the rapid rise in interest, noting particularly the number of Australians now seeking advice from acupuncturists, chiropractors and naturopaths as well as using complementary medicine products regularly.\(^\text{21}\) This increased concentration on practices and practitioners is mirrored in the complementary medicines industry as it seeks to develop new products to address this growing demand.

Complementary medicines represent a substantial, growing industry with manufacturing jobs and export potential in Asia. Industry revenue was $3.9 billion in 2015-2016 with just under 31,000 businesses contributing $1.5 billion in wages to the national economy.\(^\text{22}\) Australian companies export over $600 million in complementary medicines to more than 26 countries in South East Asia, Europe and the Americas.\(^\text{23, 24}\) The Australian Trade and Investment Commission – Austrade, report exports to Asia have more than doubled in the last year.\(^\text{25}\) Integrative medicine is now one of Australia’s top 20 exports.\(^\text{26}\) There is enormous growth potential for the export market.

Australia needs to provide a regulatory environment which supports product innovation. We must ensure Australia remains at the leading edge in integrative medicine research and development by creating solutions to key barriers of product innovation, including examining methods of data protection, mutual recognition of herbal ingredients from similar regulatory jurisdictions, and improving the communication of information about integrative medicines to health professionals and consumers.
China seeks to strengthen the scientific evidence and uptake of traditional Chinese medicines internationally through various initiatives such as the China/NSW Collaborative Research Program which provided $500,000 in joint funding for traditional Chinese medicines research in 2010.27

Australia is the first Western nation to recognise and regulate the practice of Chinese medicine and boasts world-class researchers and facilities in this area. As a result, China is looking to Australia as a strong research partner in traditional Chinese medicines, including undertaking clinical trials.

Internationally, NICM has long-standing relationships with China, in the Asian basin through the World Health Organization and in Singapore where we have developed significant linkages. We continue to develop new collaborations including a Joint Research and Development Centre with the Xiyuan Hospital of the China Academy of Chinese Medical Sciences recognised by the Chinese Ministry of Science and Technology as one of its 38 key international collaborations across all scientific disciplines; and a joint Chinese Medicine Research, Education and Clinical Centre with Beijing University of Chinese Medicine.

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