HEALTH AT CURTIN
Research in the Faculty of Health Sciences
Volume 3
It is with great pleasure that we bring you Volume 3 of Health at Curtin, the magazine that focuses on some of the exciting research activities underway in the Faculty of Health Sciences at Curtin through the Curtin Health Innovation Research Institute (CHIRI).

CHIRI is all about developing effective research that can be readily translated into health policy and practice. It has a particular focus on primary care and population health, seeking to provide sustainable health delivery models for the future. This bold and relevant institute is focused on prevention, chronic disease management and the provision of wellness clinics to keep people out of hospital. CHIRI champions innovative, integrated and collaborative health research that encourages individuals to be active participants in the management of their own health care needs.

In this issue we focus on a range of research areas, and, in particular, research with an emphasis on Indigenous health and the health of our ageing population. We shine the spotlight on research being conducted by CHIRI’s Centre for International Health into ways to build greater capacity in Indigenous health and reduce the significant imbalance in health outcomes between Indigenous and non-Indigenous Australians. We also look at a unique collaboration funded by the National Health and Medical Research Council which will target research into Indigenous mental health issues.

With people living longer, diseases associated with the ageing process, such as dementia, are becoming more prevalent. Our researchers from CHIRI’s Centre for Research on Ageing are investigating the feasibility of a computerised cognitive training intervention for patients with early stage dementia.

Through our School of Nursing and Midwifery, and with research partners at the WA Health Department, we are conducting research into the importance of the early detection of delirium in elderly people when they are admitted to hospital. Failure to identify delirium may lead to an increased risk of complications, such as falls.

The CHIRI approach of interdisciplinary research focused on finding practical solutions to many of the current health care challenges is proving very successful. Our research is contributing to positive health outcomes that directly impact the community.

We hope that the articles in this publication will provide an inspiring insight into the depth and innovation of our health research at Curtin.

Professor Jill Downie
Pro Vice-Chancellor
Faculty of Health Sciences
Contrary to the view that it is a short-term condition, postnatal depression (PND) may last more than two years. Moreover, not only does PND have implications for the mother, but also for her relationships, and for the development of her baby.

Now, a unique self-management program has been developed for women suffering from PND, by Dr Anne Passmore and colleague Jodie Armstrong at Curtin’s Centre for Research into Disability and Society, in collaboration with Dr Philippa Brown, Clinical Director at King Edward Memorial Hospital’s Mother Baby Unit.

“As no single causal pathway for postnatal depression has been identified, there was the need for a range of interventions that account for the multiple origins contributing to it,” Passmore says.

“The self-management framework we’ve developed involves a collaborative partnership with the mothers. Together, we create strategies to manage everyday activities, relationships and treatment, and which take into account unique personal and environmental contexts.”

The approach is underpinned by a strong theoretical basis that supports living with a long-term health problem. Using, for example, problem-solving to develop the confidence, skills, resources and motivation that enable women with PND to regain control of their everyday lives.

Passmore explains how the self-management model differs from health models that have a ‘we know best’ approach.

“The self-management approach is: ‘You have this problem, but with help and support you can identify the best things you can do to improve your health and participation outcomes,’” she says.

“This philosophy of collaboration is strongly embedded in occupational therapy practice, and the self-management program – while based on a group-work approach – is also suitable for individual involvement.”

To develop the specific program content, the research team interviewed women who had experienced severe PND to determine their perceived needs during this time. They found there was considerable consensus on the issues of most concern. Examples included finding time-out for themselves, finding support avenues within the community, and the loss of identity – with some new mothers having difficulty with the transition from career-oriented woman to being ‘a mum’.

The result is a program that is down-to-earth and practical, and deals with time-out, stress, and how to manage, enjoy and play with the baby at home and out of the house. It also addresses concerns about nutrition, fitness and post-partum weight gain.

“The use of peer leaders – women who have undergone the same experience – is an important part of the self-management model,” Passmore says.

“When mothers recognise that others have experienced PND, managed it, and are now coping and enjoying their lives, the effect is quite powerful.”

Participants report they feel more in control of their lives, and, Passmore notes, there’s a measurable improvement in their parenting skills and in managing generally.

“Essentially, it appears from pilot-testing that the program is doing what it’s designed to do, which is to enhance self-efficacy in mothering,” she says.

The self-management intervention is continuing to be run by senior occupational therapy students from Curtin’s School of Occupational Therapy and Social Work (where the Centre for Research into Disability and Society is based) under supervision at the Mother Baby Unit.
While health services are delivered also makes a difference. Serious disease often requires high-technology care and treatment in a tertiary hospital, yet, as Thompson points out, there aren’t many Aboriginal staff members in them.

“Without wanting to single out Royal Perth Hospital – it’s a hospital that makes a real effort around Aboriginal patients, and Aboriginal people prefer to go there – of about 3,000 (full-time equivalent) staff, perhaps 10 are Aboriginal, yet nearly 10 per cent of patients are Aboriginal,” she says.

“Hospital is a really alienating environment for all of us, but imagine English isn’t your first language, you usually sleep on a mattress outdoors, and you want your family around when you’re sick, possibly dying, but are allowed only two visitors at a time.”

Thompson says an understanding of people’s past is the starting point, and that learning to communicate is vital for crossing the cultural divide.

“Those of us who grew up in white, middle-class families may not realise how recent and raw many events are for Aboriginal people. For example, there were curfews, and there were towns they weren’t allowed to enter,” she explains.

“Aboriginal people have a belief system where relationships need trust – and they’re already coming with distrust because there’s a collective memory of exclusion in many ways.”

Thompson applauds the curriculum reforms that are underway at Curtin. Curriculum reforms across the Faculty of Health Sciences will ensure that appropriate content relating to Indigenous Australians is included. A current project, supported by the Department of Education, Employment and Workforce Relations, will assist the process.

Thompson is also positive about the Curtin Reconciliation Action Plan, which has an active group within Health Sciences and is chaired by the Pro Vice-Chancellor, Jill Downie. She is anticipating outcomes such as more Aboriginal staff within Health Sciences, and better pathways for Aboriginal people into health science fields.

“Nursing, for example, is partnering with Aboriginal health-worker training college Marr Mooditj for enrolled nurse training. Aboriginal health workers can become enrolled nurses, and that articulates with a registered nurse training program,” she says.

According to Thompson, the links between research and teaching and learning must be emphasised, and research must inform the way health sciences students are trained. More work is needed to develop the capacity of Aboriginal people to understand those systems, she adds.

“We have capacity-building projects that support Aboriginal researchers, getting them skilled in research so they can develop and lead their own research projects,” she says.

“For example, one member of the Aboriginal reference group for one of our research projects has used the findings to build her understanding and skills, and applied these in her work role. The research is informing the education she delivers all over the state, and to audiences that would otherwise be hard to reach.”

“The non-Indigenous researchers involved are also learning a lot about Aboriginal communities and their belief systems, which creates better understanding and builds relationships.”

During the past year, the Centre for International Health has appointed three Aboriginal researchers as associate professors. The centre is therefore well positioned to contribute high-impact research in Aboriginal health, to the health system and the wider community.

“Senior research appointments can also help progress the curriculum reforms in the teaching of health sciences,” Thompson says.
The number of Australians with dementia is expected to more than triple within 40 years, as the unprecedented large cohort of baby boomers moves into older age.

At Curtin’s Centre for Research on Ageing, Dr Simon Colquhoun understands that, for dementia sufferers, maintaining peak cognitive function is important for undertaking daily activities, maintaining quality of life, and maximising independence. He and his team are now investigating the feasibility of a computerised cognitive training intervention for patients with early stage dementia.

The US-based Posit Science Corporation is a partner in the study, which is trialling the company’s Brain Fitness and Cortex™ with InSight™ computer-based programs as interventions for people with early stage dementia.

Colquhoun describes the programs as “brain fitness exercise machines”.

“People with dementia undergo a marked decline in their processing. The two programs are cognitive training tools that train auditory and visual processing, respectively, and increase the speed at which information is processed,” Colquhoun says.

“The Brain Fitness program focuses on the brain’s auditory system. It speeds up and sharpens auditory information, so the brain can hear and remember more details.

“US research has shown that when people grasp what they hear more quickly, and remember it better, they feel more engaged with those around them.”

The Brain Fitness program comprises six computer-based exercises that improve the auditory system in several ways. Applicants complete a series of exercises for one hour a day, five times a week, with exercises increasing in level of difficulty to match the applicant’s ability to complete them.

Colquhoun reports that in terms of the program’s usability, participants found the program relatively easy to learn, and the program’s ability to adapt to each individual’s level of skill helped them learn at their own pace.

“However, in regards to efficiency, some participants felt they weren’t doing enough, and the American accent used in Brain Fitness made the word-based exercises more difficult for Australians,” he says.

“We’d now like to do an investigation on a larger sample, looking at the effectiveness of the cognitive training tool as a non-pharmacological intervention for people with early stage dementia.”

About 230,000 Australians suffer from dementia, and health care professionals are warning that the number will soon surge. In response, new research into better prevention, treatment and care for people with dementia is underway at Curtin’s Centre for Research on Ageing.
CAN EXERCISE HELP OVERCOME STROKE AND SPINAL INJURY DISABILITY?

Every year, there are about 300 new cases of spinal cord injury in Australia and about 30,000 new traumatic brain injury hospital admissions. These injuries often occur between the ages of 15 and 40 – which coincides with career development, establishing families, and the completion of education and training – and usually result in lifelong disability.

Thanks in part to the work of two Western Australian-based researchers, spinal cord injury sufferers will have a better chance of recovering their mobility. Garry Allison, Associate Professor of Neuroscience and Trauma Physiotherapy at Curtin, and Professor Sarah Dunlop, from The University of Western Australia, are members of a national team that has been awarded almost $5 million by the Neurotrauma Research Program for a five-year study into the effects of physical activity on spinal cord injury.

Allison is chief investigator on the program (headed by Professor Mary Galea at the University of Melbourne) that will investigate neurological recovery, maintaining health and wellness, and optimising independence.

“The project is known as SCIPA, which stands for Spinal Cord Injury Australia, then rolled out to trainers across Australia and New Zealand. The SCIPA program aims to use new rehabilitation strategies directed at neuromuscular activation below the level of the injury, and will involve all seven spinal units in Australia and New Zealand, including the Sir George Bedbrook Spinal Injuries Centre at Royal Perth Hospital’s Shenton Park campus. Allison is also investigating the clinical efficacy of a running program for individuals recovering from stroke, in collaboration with Associate Professor John Buchanan and physiotherapist Michelle Kennedy at Royal Perth Hospital. The team has been funded by the Neurotrauma Research Program and the Physiotherapy Research Foundation to run a clinical trial of dynamic exercise following stroke.

“Complex fast movements such as running were generally assumed to decrease the individual’s ability to control the lower limb, and some consider fast movements increase the amount of tone or spasticity,” Allison says. “But when used in the later stages of some patients’ rehabilitation, this type of exercise seems to have the opposite effect.

“Rehabilitation therapists and the public are now recognising that exercise is a magic bullet for many body systems. Our running program is focused on exercising muscles and patterns of movement that are not well-controlled following stroke.”

Allison says repetition and a focus on good technique appears to be the key.

“Repetitive dynamic exercise – such as intense running, skipping, hopping and stair climbing – can enhance the performance of higher level mobility tasks, by improving the pathways and by retraining the nervous system and the brain,” he explains.

“Retraining the brain is also central to a series of experiments being conducted by Allison together with Curtin physiotherapy lecturer Trudi Fischer and honours research student Melita Morriss. The experiments are focusing on individuals with spinal cord injury who report chronic lower limb pain.

“Rather than actually moving or physically exercising, the training involves ‘imaginary exercises’, which may have an impact on individuals with a special kind of neuropathic pain,” Allison says.

Up to 60 per cent of individuals with quadriplegia experience lower-limb pain that, in most cases, is poorly controlled by known methods of medical intervention. Allison proposes that one factor contributing to the ongoing perception of pain is a change in the brain’s sensory cortex. “We’re piloting different forms of imaginary exercises for individuals who can’t move,” he says. “For example, when we ask them to think about performing certain lower limb movements in time with a metronome the pain sensation changes.”

Allison is collaborating with Fudan University in Shanghai, China, in the use of functional Magnetic Resonance Imaging. The technology, Allison explains, will allow them to examine what part of the brain is being activated with imaginary exercises under different conditions. “We hope to build techniques to identify individuals who may get pain relief from a program focused on imaginary exercise protocols,” he says. “It’s exciting research.”
At the Western Australian Biomedical Research Institute (WABRI), based at Curtin, Associate Professor Ricardo Mancera combines computational methods with physical and chemical theories of molecular structure. Mancera’s team of postdoctoral researchers and doctoral and honours research students use computers to simulate the structure and behaviour of molecules, which range from those as small as a water molecule, to large molecules such as proteins and DNA.

“I am interested in pure theory in the area of molecular modelling, but with a view to how findings can be applied for health-related benefit,” Mancera says.

“For example, models of molecular structure can characterise the interactions between drug molecules and their target receptors. We can make predictions about the likely level of activity of a drug, and see how to improve the structure of drug molecules to make them more effective.”

Drug treatments for diabetes is one such focus for Mancera. In collaboration with Professor Erik Helmerhorst, from Curtin’s School of Biomedical Sciences, Mancera is working to identify a substitute for insulin – one that, because of its small molecular size, could be administered orally rather than by injection. The research involves isolating and optimising drug molecules that bind to the insulin receptor, activate the receptor and mimic the activity of insulin.

Another area of interest for me involves predicting the structure and activity of some small proteins, or peptides, found in the venom of arthropods such as spiders, ants, centipedes and scorpions,” Mancera says.

“We’ve been collaborating with a Perth-based biotech company, Proteomics International, to identify peptides that may be capable, for example, of anti-microbial activity.”

The work involves analysing the peptides to predict their structure and likely activity. Mancera says some have the potential to become the molecular foundations of potent drugs for fighting disease.

“In this case, it is the seemingly unlikely source of arthropod venoms, and there is great potential for biomolecular modelling to have an important role in this area of drug discovery,” he says.

While the research involves investigating venoms, there are no spiders and scorpions to be found in Mancera’s lab. Proteomics International handles the collection and isolation of the venom molecules, which Mancera and his team then subject to computational scrutiny.

Another important health research project is underway in Mancera’s lab.

“I’m very interested in the molecular aspects of Alzheimer’s disease,” he says.

“One main characteristic of the disease is the formation of protein deposits in the brain. The consequences of this are that it impairs the sufferer’s cognitive and intellectual abilities, and eventually disables them mentally.”

He is using computational techniques to determine why the protein deposits form, and the molecular forces involved in their formation. This team is investigating whether there is a way of preventing the protein aggregation by using small molecules that bind to the proteins, or interact with them to prevent aggregation.

“Protein aggregation might be very desirable in some areas of the food industry, for example,” he says, “but it’s highly undesirable when it’s occurring inside your brain.

“Again, we’re beginning to use computational techniques to investigate, at a very fundamental level, what the mechanisms for protein aggregation are, and how it might be inhibited by smaller molecules. This could lead to a major drug discovery.”

A drug preventing or reducing protein aggregation would be a massive breakthrough for people who are developing or suffering from Alzheimer’s disease.

Mancera says these endeavours are just a few of the important projects he has underway.

“I have a good team at WABRI – which at times consists of about four doctoral and two or three honours students, as well as two post doctoral research scientists. And they’re being kept busy,” he says.
In 1999 Silver Chain faced a serious challenge. With its waiting list for home support growing inexorably, one of the largest home-care providers in Western Australia was faced with the prospect of restricting eligibility for services.

Professor Gill Lewin, from Curtin’s Centre for Research on Ageing, is Silver Chain’s Research Director. She explains that, fortunately, the organisation realised there was another option.

Rather than restrict eligibility, we decided it would be more people-sensitive to help individuals regain the functionality they were having difficulty with, regain their independence, and slow the decline of their functional abilities.” Lewin says.

“We thought that a restorative program would help people improve their level of functioning, so they’d require a lower level of services.

“If they had chronic disease, we could help them manage it by looking at nutrition, activity, and lifestyle associated with being as healthy as possible.”

Silver Chain developed the Home Independence Program (HIP) and piloted it with a group of people on the services waiting list.

HIP involves a team of allied-health staff that includes a nurse, an occupational therapist and a physiotherapist. It’s an interdisciplinary model whereby the team members upskill each other so that a single professional is able to work with the client, delivering any of the strategies the program incorporates.

The pilot was so successful that more than 70 per cent of people either no longer required services or required a lower level of services. The WA Health Department then agreed to an operational trial of HIP in Myaree, in 2001. People who had been referred for home support services were asked if they were interested in participating in a program that would help them regain some of their abilities.

“During the operational trial we received funding from Lotterywest to support a control trial which would confirm if it was the program making a difference, and not just attention and placebo effect,” Lewin explains.

The control trial compared 100 participants in HIP with 100 people receiving normal home care. The findings validated the pilot; individuals not only improved their functioning (as measured by standardised tests) and their ability to do tasks, but also their morale, self-confidence and quality of life.

“Even a year after they had started HIP, more than 60 per cent of participants needed no assistance; whereas, of those receiving normal services, only about 10 per cent could manage without the services,” Lewin says.

As HIP is a professional intervention, compared with Silver Chain’s standard home care services that are delivered by care workers, its cost-effectiveness needed to be assessed.

“We actually found that over that year there was no significant difference between the costs of the two groups,” Lewin says. “But because 60 per cent of the HIP group no longer needed services (compared with less than 20 per cent of the control group) we expected to see substantial cost savings in the following year.”

Lewin explains that a final, randomised control was required to prove the efficacy of the HIP program “because participants in the control trial had volunteered for HIP – so possibly they were a group whose desire to be more independent was greater in the first place”.

A five-year randomised control trial with older people in Perth was funded by the Australian Health Ministers Advisory Council priority driven grants system. Participants comprised those that had been referred, or had referred themselves, for personal-care services such as assistance with bathing, medication, continence care and grooming.

Of the 750 trial participants, 375 were randomly assigned to either a HIP team or normal home care services. Each group of 375 then had 150 participants recruited into a sub-study where researchers who were not involved in their care would visit them at home on three occasions: shortly after referral, three months later and then one year later.

“As in the control trial, participants were given the standard tests of functioning and quality of life,” Lewin says. “The results showed that a significant proportion of the people in HIP – again, it’s about 60 per cent – don’t need ongoing services when they finish the program, whereas only about 20 per cent of those receiving normal home care can manage on their own.”

The HIP program is limited to 12 weeks, with the average time per client lasting about eight weeks. It’s individually tailored, which involves the care manager assessing the client in terms of the issues they’re having, and what they’re able to do and can continue to achieve.

To date, 18,000 people have participated in HIP and the Personal Enablement program, which helps older people who are returning home after a hospital stay.

“HIP is about helping people realise that being elderly is not about giving up and just accepting you’re going to decline from this point on,” Lewin says, “but that you can be actively involved and participate in life, learn new ways of doing things, and retain and regain many capabilities.”
Most Australians are aware that smoking causes debilitating diseases and death, yet many young people disregard anti-smoking messages. Dr Owen Carter, from the Centre for Behavioural Research in Cancer Control, concludes it’s because young smokers don’t foresee becoming long-term smokers.

“They plan to quit at a certain milestone – when they ‘settle down’, reach 30 or become a mum, for example,” Carter says. “They don’t believe they’ll get lung cancer or emphysema.”

“People in their early 20s are often social smokers who don’t smoke during the week, but go through two packets on Friday or Saturday night. Then, due to stress or other factors, they start buying cigarettes during the week and are physiologically addicted long before they realise or admit it.”

Although young social smokers may ignore messages regarding long-term health risks, some side effects of smoking do concern them. Reduced fitness is a deterrent, especially for men, and aesthetic concerns – smelly hair, bad skin, yellow teeth and fingers, and facial ageing – are also strong motivators.

Because mainstream anti-smoking messages can be ineffective, Carter and his colleague, Professor Rob Donovan, have been researching whether messages highlighting the “disgusting” aspects of smoking might have more success with young people, especially if they’re delivered in new ways.

While tobacco advertising restrictions can be circumvented on the internet, Carter and Donovan saw an opportunity for the internet to deliver anti-smoking messages to the Faceboolk generation.

“We devised a simple trial where 200 randomly allocated university students in Western Australia would receive one of two ‘viral’ emails containing a hyperlink to a short video that depicted smoking as a repulsive thing to do,” Carter says.

“The advertisements, called ‘Toilet’ and ‘Rubbish’, emphasised the unattractive nature of smoking. Viewers were encouraged to forward the email to friends and complete an online survey about the ads.”

To assess dissemination of the email beyond the 200 students, unique downloads for each advertisement were identified by IP location. In the first four months there were more than 800 unique viewings, or ‘hits’ of the advertisements. However, the average of 27 hits a day during the first two weeks then reduced to an average of about four hits a day over the next 14 weeks. IP addresses identified hits from three other Australian states and seven other countries.

Although there was a greater than fourfold return in dissemination for each initial email sent, Carter says the daily hits quickly deteriorated because “only exceptionally compelling materials will ever likely become self-perpetuating”.

“The ideal outcome would see the ads spread exponentially, as very successful viral emails do,” he says.

“Humour appears to be critical to viral emails being forwarded, but this can be counterproductive for tobacco control content, because it allows smokers to dismiss the message as less credible.”

He says viral emails could be a useful strategy to complement other internet dissemination methods for tobacco control materials, but it’s unlikely they can sustain a tobacco control promotion on their own.

“The initial exercise was just based on a great idea, and using two ads we’d previously created with a Healthway grant. Our next step is to obtain a National Health Medical Research Council grant for a larger, more in-depth study,” he says.

“For example, we’ll investigate critical things like, what’s the best type of email subject heading, and text; and what makes someone open an attachment rather than delete it. “We’ll also do formative research with people to see what sort of things they’re likely to forward on, and the sort of people they’ll forward to.”

Carter says that, in terms of tobacco control, the internet is a new battleground that’s terra incognita for most researchers.

“Reaching smokers is a challenge. Less than 10 per cent of uni students smoke, so there were few smokers in our sample. [In fact, of the 103 survey respondents, most were non-smokers.] We’re not sure that a smoker would even forward the message on – and would a non-smoker forward it to a smoker?”
Brain Fitness programs put through their paces

Alzheimer's Australia WA

Hearing loss has implications beyond simply having trouble following a conversation. As hearing loss increases, confidence ebbs and social disengagement may begin. Now, Alzheimer's Australia WA are piloting a program to address the loss of cognitive function that, for many older people, reduces their quality of life.

In 2003, Rhonda Parker, then an adjunct associate professor at Curtin’s Centre for Research on Ageing, approached Alzheimer's Australia WA (AAWA) with a proposal to develop a community-group-based 'cognitive training program' for seniors in Western Australia. The program would target those people who were interested in healthy 'mental ageing' as well as physical ageing, but who were not yet experiencing significant cognitive impairment. The aim was to determine whether developing 'brain fitness' and improving retention could provide benefits in their social and daily lives. In 2009, AAWA commissioned the centre to review the evidence for cognitive training, and identify existing products or programs that were supported by clinical trial evidence. David Gribble, AAWA’s General Manager of Strategic Initiatives, was pleased with the review.

"It indicated that 'brain plasticity' – the capacity of the brain to change its physical structure to accommodate new learning – was an established and accepted scientific principle," Gribble says. "And research evidence demonstrates it applies equally to cognitive function in older people."

Of the 13 training programs or products that claimed to benefit memory, only one provider – Posit Science – had peer-reviewed, randomised control-trial evidence of their programs' effectiveness. Posit Science grew out of neuroscience research at the University of California San Francisco, and was founded in 2003 by internationally respected researcher Dr Michael Merzenich.

"The corporation has balanced their need to be commercial with their need to continue the research base," Gribble says. "They have an excellent product suite, and their ethics align with ours."

Posit Science’s Brain Fitness Program is well known in the US, and Humana Health Insurance subsidises the program’s cost for its members, on the same basis as other wellness therapies such as physiotherapy. AAWA has negotiated with Posit Science to license the Brain Fitness and InSight products for use here in Australia, and has received Lotterywest funding for a 12-month Brain Fitness pilot program in a social context – where people come together as they would in a gym class, offering each other support.

Gribble points out the aim of the pilot is to demonstrate to the community the value and sustainability of ongoing seniors’ cognitive fitness group training, and not necessarily the efficacy of the particular product.

Although the pilot is not a randomised control study trial, participants will be tested pre and post training, using validated tools provided by Posit Science. These will determine the benefits participants gained, both in terms of memory function and perceived improvement in social and in daily life.

Gribble says this is a crucial part of the process, as a lot of research around cognitive training programs indicates that an immediate memory benefit may not translate to an ongoing improvement in people’s daily lives.

"Posit Science has demonstrated that in addition to program participants gaining a better memory, 75 per cent of people report it translates into their daily life. They’re more confident to go to a restaurant or shopping, for example, because they can think faster. This real-world benefit is important," he explains.

Because listening is closely related to cognitive ability, Brain Fitness exercises focus on auditory processing. The sound and language exercises are designed to help participants identify sounds faster, understand language better, and remember information more accurately.

The program adjusts to each person’s abilities, and is intended to be challenging, which is important for improving the brain’s capabilities. The goal is for participants to apply focused attention to reach their personal best.

The Brain Fitness program initially assesses participants’ processing speed and level of ability. It then sets a personal percentage goal for improvement. The remaining sessions provide exercises that enable participants to reach that percentage goal for improvement. The remaining sessions provide exercises that enable participants to reach that percentage goal by the end of the program.

"In threshold training, the program stays a step ahead, so you’re constantly being challenged. As you achieve goals, they become more difficult,” Gribble explains. “But if for some reason you’re having trouble focusing, it will recalibrate and work to build you back up. The aim is to improve brain fitness from the ground up. It’s not about developing memory tricks. Posit Science research demonstrates the brain’s ability to change and improve its capabilities, at any age.”

AAWA’s pilot program has commenced with participants from two retirement villages and two council-run, fitness-for-seniors programs. Retirement-village providers will participate in the Industry Review Group, in order to make informed decisions about introducing such programs into their own facilities.

The project aims to deliver two outcomes: to test effective, sustainable models for making brain fitness programs available to the community on an ongoing basis; and to demonstrate gains in cognitive function in sensory processing speed, accuracy and recall.

“AAWA is committed to making brain fitness training available as a ‘wellness’ strategy for seniors who are experiencing normal age-related memory concerns,” Gribble says.
Mental health issues seriously impact on the health and wellbeing of Indigenous Australians who do not always engage with mainstream mental health services. To address this, the National Health and Medical Research Council (NHMRC) has funded a collaborative project led by researchers at the Curtin Health Innovation Research Institute.

The project will build the capacity of a critical mass of Indigenous and non-Indigenous researchers who will engage, collaborate and work with clinicians, health care providers and Indigenous communities. Together, they will develop sustainable, culturally appropriate mental health policy and service models, including adjunctive services to chronic disease management. The Aboriginal Health Council of Western Australia will ensure the research outcomes meet the needs of Indigenous communities.

“The Capacity Building Grant is the only one of its type in WA, in that it focuses exclusively on Indigenous mental health,” says Professor Jan Piek, from the School of Psychology.

“It has brought a group together from a variety of areas, creating University-wide teams that are exploring Indigenous mental health issues. One of the aims is to develop the skills of postdoctoral researchers and PhD students in researching Indigenous mental health.”

The project will focus on a number of specific issues, including:
- the barriers to and facilitators of accessing treatment.
- mental health issues associated with chronic illness such as cardiovascular disease and cigarette smoking in Aboriginal women. Researchers will test psychometric screening tools to identify mental health issues in those with chronic health problems.
- formulating policy frameworks relevant to mental health care delivery in WA and NSW.
- the development needs of students and professionals seeking to engage with Indigenous people in mental health settings. Researchers will examine how Indigenous people talk about mental health and mental health promotion; how they talk about mental health professionals and services; and, in terms of the provision of mental health services, how this talk influences and structures interactions and the needs of Indigenous people.

Collaborations for the project are extensive. Investigators from the School of Psychology will work with researchers from Curtin’s School of Nursing and Midwifery, the Centre for International Health and Curtin’s Centre for Aboriginal Studies.

Although based at Curtin, the project also involves Edith Cowan University and the Centre for Cardiovascular and Chronic Care at Curtin’s Sydney Campus. Involvement from other states will follow.

Professor David Vicary, also from the School of Psychology, says the grant will fund about seven researchers, with a number of PhD students also associated with the project – some being Curtin staff who are Aboriginal or Torres Strait Islander.

“A main premise of the grant is to build capacity, and to build networks and actually see the research hit the ground,” Vicary says.

“The research will involve about 50 people, including postgraduate students, supervisors, mentors and other team members. And we hope the number increases exponentially each year the grant is in operation.

“We want to actually make a difference to Indigenous people in terms of service delivery and outcomes, and we’ll work very closely with the Aboriginal community and our partners to ensure this happens.”
Over the past four years, a research program between Curtin and a Western Australian metropolitan tertiary hospital has focused on ways to prevent delirium or reduce its impact on elderly hospitalised patients, through early detection and treatment.

The research is being led by Associate Professor Diane Wynaden, from Curtin’s School of Nursing and Midwifery. “Delirium presents as a short-term disturbance of consciousness, which may last from a few hours to as long as several months, if left untreated,” Wynaden says. “It is characterised by acute onset inattention, disorganised thinking and/or altered level of consciousness and fluctuating behaviours, and indicates an underlying pathology or insult.”

Delirium is experienced by between seven and 10 per cent of elderly patients presenting to the emergency department (ED). However, research indicates that only between one-sixth and one-third of these episodes are detected. A similar situation exists when patients are admitted into hospital.

In 2006, the research team audited more than 1,200 hospitalised patients, and found that although about 10 per cent of patients had behavioural and cognitive changes suggestive of delirium, only four per cent had a diagnosis of delirium recorded in their medical record. Another study identified that nurses lacked knowledge and understanding of delirium and its associated risk factors. To address this, the research team developed a self-directed learning package on delirium, with the support of the Western Australian Dementia Training Study Centre.

The resource provides knowledge and skills in assessment and management of delirium.

The team then conducted a pilot study of 30 patients presenting to the ED to determine whether routine cognitive screening of elderly patients could lead to early identification of delirium in this patient group.

The pilot demonstrated the importance of completing a cognitive assessment on elderly people, as cognitive changes can be an early and sensitive indicator of physiological dysfunction. The publication resulting from the study has been recognised as making a significant contribution to knowledge in the subject area.

The WA Health Department and the Dementia Training Centre are now supporting a much larger study conducted by PhD research student Malcolm Hare, at Curtin’s School of Nursing and Midwifery, who has received a $15,000 Helen Bailey Scholarship from the Health Department.

Wynaden says ongoing research in the area has greatly increased health professionals’ awareness of what delirium is, and what they can do to prevent or decrease it. Many staff at the hospital are using an assessment checklist that helps them complete a quick screening of the patient on a regular basis during their stay in hospital. This assists in early identification of those patients who are at risk, such as those with dementia.

“Delirium and dementia are closely linked. Delirium may occur in about 10 per cent of normal elderly people, but when a patient has pre-existing dementia, there’s about an 89 per cent risk they could develop delirium,” Wynaden says.

She says in addition to the impact on patients and the health staff who care for them, delirium has a substantial financial impact. “A large number of people who are at risk of a fall probably have delirium,” she says.

“There’s been a lot of effort and money invested in reducing falls, and rightly so. But it was only recently that the prevention and early identification of delirium had been clearly identified as an important factor in reducing falls. “We hope our research will highlight the issues about delirium, and through raising awareness, significantly reduce the number of complications in the elderly during hospitalisation.”
The most common asbestos-related disease (ARD), mesothelioma, kills 500 Australians each year, and the rate is continuing to increase. It is predicted that asbestos exposure to date will eventually see its death toll reach 10,000.

“Despite the prevalence of asbestos in the community and the statistics on ARDs, a national survey of asbestos exposure had not been undertaken until recently,” says Professor Peter Howat, Director of the Centre for Behavioural Research in Cancer Control (CBRCC), in Curtin’s School of Public Health.

As part of a national program under the National Research Centre for Asbestos Disease, Howat and CBRCC colleagues Dr Chad Lin and Geoffrey Jalleh are participating in a major, five-year asbestos research program.

The National Health and Medical Research Council has funded the collaborative research program, which also involves teams at The University of Western Australia (UWA) and Murdoch University.

“At UWA, Professor Bill Musk and his colleagues are taking more of a medical approach – looking at specific occupations and former Wittenoom residents. We were invited into the program because of our interest in residential community asbestos,” Howat says.

The initial phase of the program comprised a nationwide, computer-assisted phone interview survey of a stratified random sample of 2,800 adults. The first national survey of its kind in the world, the aim was to examine the extent of exposure to asbestos throughout Australian communities, determine the actions taken to minimise exposure, and identify preferred interventions in residential settings.

“The survey provided excellent information about asbestos exposure by tradesmen, handymen and home-renovators working around the house, and other residents who were exposed when someone else was working around the house,” Howat says.

“It revealed that more than 80 per cent of respondents had been exposed to asbestos, with exposure being age-related, and being more common in rural areas.”

Less than half the respondents said they took precautions to reduce their exposure to asbestos fibres or dust in occupational settings, and only about a third had taken precautions in residential settings.

“The perceived risk of developing an ARD was surprisingly low,” Howat adds.

The survey was followed with a series of focus groups involving 30 people who had been exposed to asbestos in community settings. The focus groups indicated strong support for community-based interventions, and identified acceptable strategies.

According to Howat, asbestos exposure usually takes 15 to 20 years to show up as mesothelioma. So people who worked with asbestos in the 1970s and 1980s are just now developing the disease.

“We don’t want to be alarmist – the evidence to date is that it isn’t an epidemic. We’re calling it a time bomb that could go off if we don’t maintain safeguards when handling asbestos materials. It’s about being aware there is a potential problem out there,” he says.

Asbestos was widely used in Australia because it was plentiful, cheap and highly suitable in a wide variety of applications. Howat says that despite manufacturers being aware of the dangers of asbestos as early as the 1940s, asbestos was not officially phased out in Australia until about 1987.

“They continued to produce it and expose their workers and the community to it – and for many years the public health authorities seemed powerless to stop this. It’s an absolute horror story,” he says.

The CBRCC and its associates undertook the program not only because of their work with the Cancer Council, but also because it was an under-researched area, and was getting very little attention.

The next stage of the program involves sourcing support for the development and trial of an intervention.

“There’s an urgent need for interventions to reduce future exposure to asbestos dust and fibres in residential settings, and we’re working towards this,” Howat says.
Alcohol has a causal role in a range of physical, mental and social harms among our young people, and there is accumulating evidence to suggest that, in the long term, adolescents have a greater risk of mental ill-effects from alcohol abuse than mature adults.

Research from the National Drug Research Institute (NDRI), at Curtin’s Health Research Campus, shows that between 1993 and 2002, more than 2,600 Australians aged 15 to 24 died from an alcohol-attributable injury or disease, due to risky or high-risk drinking. “This equates to about 15 per cent of all deaths in that age group. About one in five hospitalisations for that age group during that period was attributable to alcohol,” says Professor Tanya Chikritzhs, of NDRI.

New measures are clearly required to change the alcohol consumption habits of young people. Accordingly, a submission by NDRI researchers to a recent Senate committee inquiry into ready-to-drink (RTD) alcohol beverages argued that an increase in the excise on RTDs (commonly known as ‘alcopops’) would reduce consumption among young people.

Evidence closer to home also supports this. In 1992, the Northern Territory introduced a comprehensive program to reduce alcohol consumption and alcohol-related harm, known as the Living With Alcohol (LWA) program. It included a small levy being imposed on beverages containing at least three per cent alcohol by volume, which raised the cost of the beverages by about five cents per standard drink.

“NDRI evaluations of the LWA program showed public health, safety and economic impacts,” Chikritzhs says. “The combined impact of the program and levy resulted in an immediate reduction in acute alcohol-attributable deaths, and financial cost savings to the Territory. However, without the levy, the LWA program did not show a significant impact on acute alcohol-attributable deaths.”

Chikritzhs says the most effective harm-minimisation strategy is to tax alcoholic beverages according to their alcohol content. “When discrepancies like the current wine equalisation tax exist, some drinkers turn to products that are cheaper per standard drink, especially those for whom intoxication at the lowest cost is a major factor,” she explains.

“A mandated minimum price for beverages would reduce the switching to lower-priced drinks. A ‘floor price’ policy was recently introduced in Scotland and is being considered by other countries. “Increasing the tax on beverages associated with high levels of harm, such as RTDs, will encourage the production and consumption of lower-strength beverages, and the result will be lower levels of alcohol-related harm.”

Critics (some from the alcohol industry, but also other researchers) have argued that while a tax increase could reduce RTD consumption, most young people would merely switch to other alcoholic beverages. “The weight of scientific evidence suggests otherwise,” Chikritzhs says, “and specifically, that overall consumption is likely to decline because young peoples’ demand for alcohol is elastic and price-sensitive.”

In 2004 and 2005, almost 3,500 Australians died from alcohol-related causes. Moreover, alcohol increases the risk of adolescent mortality and morbidity from violence, suicide, homicide, substance abuse and impaired driving.
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