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Editorial: People, computers, the internet and a changing world

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When I think about the world of naturopathy and herbal medicine twenty years ago compared with today, the changes are phenomenal. Coming from a diploma level course, we all believed that naturopathy and herbal medicine was defined by our technical skills, formulations and treatment protocols, with instructions delivered on paper. Now naturopathy is more complex and involves keeping up to date with new understandings of multi-morbid health states, inter-related physiology, ecological balance, environmental impacts, nucleotide polymorphisms, gene expression and silencing, nutrigenomics and political and psychosocial impacts all conceptualised via the ‘screen’ and communicated with a paperless record. It is easy to see why additional skills are needed to help us engage with an increasingly complex world. ‘Enterprise skills’, which are well-known in education circles, include skills in digital literacy, expression and presentation, creativity and problem solving are now being recognised as crucial across all professional disciplines to successfully navigate future challenges. These skills characterise human intelligence and are becoming highly valued in the workforce as automation fulfils many traditional roles.

Heading up the suite of enterprise skills is critical thinking, a skill increasingly needed by health practitioners, and sought by the community and employers. Critical thinking is a fundamental component of all bachelor degree curriculums. It involves developing skills to analyse a set of inter-related concepts or questions, increased awareness of psychology (cognitive biases), developed tolerance for ambiguity and frequently thinking about the way we think. One of the pivotal changes to naturopathy and herbal medicine has been the introduction of minimum bachelor degree level training and graduates with critical capacity are contributing to the growth of our profession in a changing world. And this is bringing benefits for us all.

Ongoing public acceptance is essential to maintaining our relevance and professional viability in a changing healthcare landscape. Evidence for a strong public appreciation of the role of naturopaths and herbalists can be found in Reid and colleagues’ Systematic Review on the public perceptions and drivers for use of naturopathy as a profession. It presents strong evidence that naturopathy is seen by Australian consumers as being aligned with their expectations and beliefs about excellent health care and able to meet their complex health needs as a stand-alone practice alongside and as part of conventional health and medical services. Naturopaths and herbalists have undertaken activities to fortify public acceptance and secure a place in the healthcare workforce. Other than clinical practice and industry roles, these activities include publishing in peer review journals and disseminating new knowledge, competing for research funding, providing sophisticated, multi-layered and multidisciplinary education, building networks that are often nuanced and complex, inspiring policy change at government level, developing resources and building local and global collaborations. Outcomes from these activities are helping us to be heard, to be taken seriously and to meet the challenges we face as a profession.

We have a bright future ahead, increased personal and community health are by far the largest need to be met by future human workers. It is crucial that we continue to reflect on our challenges and our progress, increase our professional capacity, express our authentic voice, and continue to contribute and play our important role.

This edition of the Australian Journal of Herbal and Naturopathic Medicine includes a conference report from Sri Lanka by Christine Thomas. This was an inspiring conference with themes of integration of Ayurveda and Western medicine, whilst preserving the integrity of traditional practice.

I am very pleased to include a case study describing the successful management of chronic migraines in a pregnant woman with the mineral salt of magnesium phosphate (Celloid MP). The mineral salts are often the dispensary ‘bridesmaids’ in this age of next gen nutraceuticals. It is ironic that two of the most successful Australian naturopaths in history, who generously fund the lion’s share of university-based complementary
medicine research in Australia, were the inventors of the tissue salts: Alf Jacka and Maurice Blackmore. I’m pleased to draw attention to the Celloids and contribute to the evidence base for their use. There is a vacuum of published research for this intervention and although case studies provide limited generalisability, they seed research questions, raise profiles of interventions and develop clinical treatment options.

We also have a fascinating case study and short literature review on the long-term effective naturopathic management of allergic rhinitis and sinusitis. The client was seeking to reduce dependence on pharmaceutical medications (antihistamines), which is a common goal of complementary medicine consumers. Understanding of the case was developed using iridology.

Once again Jodi Testa has been working hard and summarised the published evidence for naturopathy and herbal medicine. This includes a research project by yours truly; thank you for an accurate review, Jodi. Other summaries include investigations into the effectiveness and effects of naturopathic and herbal medicine for mental health, chronic pain, digestion, liver injury and bone health.

Around the colleges, institutes and universities presents two inspiring naturopaths, Ian Breakspear and David Casteleijn, our esteemed colleagues. Ian’s words of wisdom extend from extensive on-the-ground experience as a clinician and educator both from concept development, design, policy and actual hands-on delivery in a range of formats and institutions. David Casteleijn is a newly elected board member of the NHAA, a lecturer in naturopathy and research student. Thank you for your contribution.

Finally, I would like to wish you all a very happy, restful and recuperative festive and holiday season and a wonderful 2018. Stay safe.

References
Report from Tradmed International Conference, Sri Lanka 2017: Multidisciplinary research bringing together academia, clinical practice and industry from the region and beyond


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Abstract
An international symposium on traditional medicine (TM) and complementary medicine (CM), Tradmed International, took place in Sri Lanka on 23–25 November 2017. Organised by the Ministry of Health, Nutrition and Indigenous Medicine of the Government of Sri Lanka, the World Health Organization and the University of Sri Jayewardenepura, the symposium was a multinational platform where the latest research and production of TM and CM was presented and discussed. It ushered in the establishment of an integrative, evidence-based TM system in Sri Lanka. A wide scope of TM- and CM-related issues were covered under the two broad themes of ‘TM and CM service delivery for health promotion, disease prevention and management’ and ‘Safety, quality, efficacy and regulation of TM and CM products’. Experts shared their research findings through oral and poster presentations. It was proposed that this initiative would pave the way towards multidisciplinary research, bringing together academia and industry from the region and beyond in an innovative platform.

Keywords: Sri Lanka, Ayurveda, evidence-based medicine, traditional medicine, complementary medicine, integrative medicine.

Tropical Sri Lanka is a country of rich heritage, one of which is its indigenous system of medicine which has been practised by the people since time immemorial. The Sri Lankan traditional medicinal system is known as Ayurveda, which means the science of life, and it is based on the rich assortment of medicinal plants in the country. It is a mixture of Sinhala traditional medicine (Deshiya Chikitsa), the Ayurveda and Siddha systems of India and the Unani medicine of Greece and the Arabs. This traditional medicinal system, which has more than 3000 years of tested and demonstrated efficacy, is a way of life in Sri Lanka and is generally the first approach for disease control by the locals. Most Sri Lankans are familiar with the traditional medicinal system because the knowledge has been passed down by their ancestors. Here tradition is lived. It was for this reason the Ministry of Health, Nutrition and Indigenous Medicine has taken steps to further strengthen its national health system by incorporating evidence-based practice methods for traditional indigenous treatments in acknowledgement of its important role and to pave the way for global advancement and acceptance.

The Tradmed International Sri Lanka symposium was held on 23–25 November 2017 in Colombo, the nation’s capital. It was a forum for academics, practitioners and researchers to review and share their expertise and knowledge in traditional medicine to develop a wider range of stake holders in the hope that this will lead to innovations, integration and development of products, services and the promotion of safe and effective use of traditional and complementary medicine. The forum also aimed to promote healthy lifestyle strategies and reduce the impact of non-communicable diseases, which are on the rise. The event also included a parallel educational exhibition and trade fair on traditional and complementary medicine. The outstanding abstracts (100–150) will be published in the Biomed Central (BMC) Journal of Complementary and Alternative Medicine. This is the first time that Sri Lankan traditional medicine symposium proceedings will be published in an international journal listed in PubMed of the US National Library of Medicine.

The chief guest was His Excellency Maithripala Sirisensa, President of the Democratic Socialist Republic of Sri Lanka. Competing with the throng of dazzling women in their colourful sarees were scores of military
and bodyguard personnel providing maximum security for the President which was in stark contrast to Australian international herbal medicine conferences and reminded attendees of the high status in which Sri Lankans hold their traditional medicines. Even the author’s computer was tested by the Search and Bomb disposal unit after a full body scan. However, once we were cleared the pageantry began with a ceremonial procession of dancers, the lighting of the traditional oil lamp and the national anthem, Sri Lanka Matha. In his opening ceremony address, the President emphasised the need to restore the honour of traditional medicine doctors, which would in turn re-establish native Sri Lankan values. Historically, indigenous physicians enjoyed a noble position in the country’s social hierarchy due to the royal patronage granted to them by ancient kings.

Standing out in the crowd I saw, I am told, the Vedda community chief Uruwarige Wannila Aetto. The Vedda, or Wanniya-laeto (forest-dwellers) as they call themselves, are a small, primitive community who are Sri Lanka’s Aborigines, descending from the island’s original inhabitants of the Neolithic era, dating from at least 16,000BC. The chieftain, who had a white beard flowing down his bare chest, was wearing a traditional sarong and carrying a jungle axe over his shoulder, the mark of Wanniya-laeto identity. They are hunter gatherers faced with an imminent threat of extinction as a consequence of their contact with the more advanced communities. According to the Veddas, most of the diseases are caused by ancestral spirits, Nae Yakku. Treatment of ailments is mainly based on drinking water produced by boiling leaves and barks of trees and carrying out spiritual ceremonies. During lunch, the chieftain spoke and a healing ritual was performed where a person was possessed by one of these Nae Yakku. There was no translation provided; however, in the past the chieftain has been asked to speak about traditional medicine and he said: “Maybe you have invited me to speak to see what you can get from us to meet your medical problems most of which are rooted in the modern lifestyle that you have adopted to live in. We Veddas are living with nature in the natural environment and our medical systems are nature-based and traditional. I don’t think you can follow us in toto but my advice for you is to stop destroying the natural environment in planning your development work. I don’t see any benefit for human life in destroying nature gifted trees, plants and flowers and replacing them with industry made artificial trees, plants and flowers which you are doing now. My advice for you is to get the people to curtail destroying the environment in planning development as much as possible. That’s the best for human health and health of the world as well.”

The Regional Director of the World Health Organization (WHO) South-East Asia Region, Dr Poonam Khetrapal Singh, said in her opening ceremony address that in Sri Lanka traditional medicine is flourishing and for some this is their only source of health care. She said the WHO Traditional Medicine Strategy 2014–2023 was developed with two goals: harnessing the potential contribution of traditional medicine to health, wellness and people-centered health care and promoting the safe and effective use of traditional medicine by regulating, researching and integrating traditional medicine products, practitioners and practice into public health systems, where appropriate. She said the Tradmed International symposium gave a valuable boost to research and congratulated the organisers.

For Australian herbalists, the most exciting representation was by an Australian researcher revealing that a native Australian plant could be the key to a Zika virus cure. Dr Trudi Collet, a biochemist who heads a team that examines the medicinal properties of Australian native plants, said she had been examining the antiviral effects of a particular compound when her team found it could kill the Zika virus without any damage to the host. Dr Collet is currently doing pioneering work in the development of novel therapeutics for global infections and diseases. Dr Collet and her team, the Indigenous Medicines Group and the Institute of Health and Biomedical Innovation based at the Queensland University of Technology, have recently identified the textbook purchase for the equivalent of $2.50 from the educational exhibition and trade fair on traditional and complementary medicine.
compounds contained within an Australian native plant that can 100 per cent kill the Zika virus in vitro, halt it and stop it replicating without any damage to the host mammalian cells. Unfortunately, for commercial reasons, Dr Collet would not disclose which plant these potential breakthroughs had come from. The plant, referred to as ‘denoted species 8472’, is in preliminary investigations yet to be tested on humans. Dr Collet said while it is a plant which is indigenous to Australia it was not used as a traditional medicine by Australian Aborigines. The implications of this work for other viruses is far-reaching as Zika, Dengue, West Nile, Japanese Encephalitis and Yellow Fever are all from the same family of viruses — flaviviridae. Dr Collet’s work has also led to the discovery of a novel plant-derived broad-spectrum antibiotic which is effective against four of the WHO’s top-12 priority bacterial pathogens. She said antimicrobials are central to the global health system and the recent spread of antibiotic-resistant pathogens has significantly depleted the supply of efficacious antibiotics. “It is more important now than ever to identify novel antimicrobials to prevent our return to the pre-antibiotic era. The rate at which resistant organisms are being uncovered exceeds that at which new effective therapeutics are being discovered.” Species 8472 was shown in vitro to be highly potent against both Gram-positive (Methicillin-Resistant Staphylococcus aureus, vancomycin-resistant enterococci, Bacillus cereus, Streptococcus pyogenes) and Gram-negative (Escherichia coli, multidrug-resistant Acinetobacter baumannii, Proteus spp.) bacteria. These findings will have a significant global impact given the dearth of antibiotics currently available to have the ability to effectively clear an infection caused by an antibiotic bacteria. Dr Collet was also involved in a poster session which revealed research that is expected to produce novel plant-based therapeutics which can significantly enhance the healing of chronic wounds. The project investigated the antibacterial properties of compounds present in two plant species denoted 8481 and 8482. Dr Collet also addressed Alzheimer’s disease. She said there are currently more than 342,000 Australians living with dementia and this is expected to rise to almost 900,000 by 2050 without a medical breakthrough. She said they had discovered a potential new therapy for Alzheimer’s disease that is still in its early stages relating to the cleavage of amyloid plaques. One of the hallmarks of Alzheimer’s disease is the accumulation of amyloid plaques between nerve cells (neurons) in the brain. Dr Collet will present a talk about her findings at a TEDxBrisbane event on December 2, 2017.1,2

Below is a brief summary of some of the standout information from the oral and poster sessions which I felt was relevant to practitioners in Australia.

- **Traditional medicine** has shown that water-soluble components of *Curcuma longa* (turmeric) are consumed as curries and decoctions, which has prompted hypotheses that water-soluble phytoneutrients possess pharmacological activity, not just curcuminoids. A randomised, placebo-controlled, single-blind clinical trial on patients with osteoarthritis who received 500mg of Turmacin (a water-soluble composition derived from turmeric standardised to contain bioactive polysaccharides) demonstrated safety and efficacy.3

- **Mathumeha Chooranam** is a well-known medical formula in the Siddha (the traditional Tamil system of medicine) pharmacopoeias used in the treatment of diabetes. It contains *Gymnema lactifera* (Ceylon cow plant) leaves, *Murraya koenigii* (Curry tree) leaves, *Terminalia chebula* (Chebulic myrobalan)
pericarp and *Phyllanthus emblica* (Indian gooseberry) fruit in 1:2:2:2 ratio respectively. Free radicals may significantly aggravate diabetic induced atherosclerosis and antioxidant activity is important to control the complications of diabetes. An *in vitro* assessment showed significant antioxidant activity.4

• A randomised controlled clinical trial found that *Centella asiatica* (gotu kola) has significant effects on cognitive functions. Gotu kola is an intellect promoting (*medhaya rasayana*) medicine in Ayurveda. Sixty young adults were followed for three months and assessed for improved cognitive function. One group (n=30) were given gotu kola capsules once a day and the other group were given gotu kola capsules with cow’s milk once a day.5

• Ayurvedic *rasayana* drugs (specific rejuvenating drugs for the prevention and management of various diseases) may play an important role in the management of tuberculosis, especially in cases of multidrug resistance. With the use of *rasayana* drugs an early recovery, better compliance with medical treatment and better management of multidrug-resistant and extensively drug-resistant cases may be managed without adverse drug reactions. In Ayurveda pulmonary tuberculosis has been well described since antiquity and written documentation spans more than 3000 years. In spite of notable progress, the challenge that is now faced is multidrug-resistant tuberculosis and the debilitating effects of anti-tuberculosis drugs. *Rasayana* therapy has been studied, with encouraging results, *in vitro* and *in vivo* for its anabolic, free radical scavenging, antioxidant, adaptogenic, bio-enhancer and immunomodulatory effects in cases of tuberculosis. Clinical studies have shown some significant results as adjuvants in preventing adverse drug reactions, promoting rapid recovery, early sputum negative results and as hepatoprotectives. Piperine, from *Piper longum*, enhances the bioavailability of the antibiotic rifampicin. Low dose Rifampicin (200mg), a bio-enhancer piperine (10mg) and a standard dose of the antibiotic Isoniazid (300mg) were given along with the antibiotic Ethambutol and an antimicrobial agent Pyrazinamide with comparable efficacy with standard WHO therapy using a conventional formulation. An ethanolic leaf extract of gotu kola was shown to ameliorate the toxic effects of the antibiotic isonicotinyl hydrazine *in vivo*. Other important *rasayana* herbs are *Withania somnifera* (744 PubMed search results), *Bacopa monnieri* (148 PubMed search results) and turmeric (*Curcuma longa* 2242, turmeric 3103 and curcumin 7462 PubMed search results).6

• Research suggests that applications of herbal medicines in cancer therapy indicate that it is time to integrate traditional treatment systems with current Western treatment techniques to achieve much improved patient survival. Despite extraordinary advances in our understanding of the biology of cancer, more than 90 per cent of all new oncology drugs that enter clinical development do not obtain marketing approval. Many of the approved drugs are effective only within selected patient populations but with many side effects and exorbitant prices limiting their availability to the economically advantaged. Medicinal herbs used in traditional treatment systems are being increasingly...
recognised as useful complementary treatments for cancer. Many clinical studies have been conducted on these traditional treatments systems, indicating better patient survival, uplifting the immune system and increasing quality of life for cancer patients, in particular, when these herbal medicines are used in combination with conventional medications. The presence of a large number of active compounds that may work together at low concentrations, directly or indirectly targeting cancer cells, and also enhancing the immune system, are some of the key mechanisms for anticancer activity. Recent studies on the biochemical and cellular level mechanisms of herbal medicines in specific tumour microenvironments provide molecular-level evidence of how these treatments may have activity.7

- Integrated approaches are needed, though, because of a failure of individual systems to fulfil patient expectations when dealing with many disease conditions. Some common examples include cancer, neurodegenerative disorders, geriatric health issues and non-communicable diseases. Lack of understanding and failure to appreciate the importance of the fundamental principles of traditional medicine (TM) and complementary and alternative medicine (CAM) by researchers in conventional medicine is a major challenge. When theories are incommensurable there is no way to compare them to each other. Paradigms can be based on different assumptions regarding the structure of their domain, which makes it impossible to compare them in a meaningful way. This could contribute to errors in selecting the study population, designing the TM and CAM intervention and evaluating outcomes. There are also unique issues in relation to getting ethical approval for such studies. Challenges include existing laws by regulatory bodies, professional misunderstandings and conflicts among sectors on sharing resources. The unavailability and difficulty of finding treatment facilities at which multiple systems can be practised also poses a challenge for conducting clinical research on integrated approaches, particularly when they are hospital-based. Problems can also arise due to attitudes of health care providers, rules and regulations and issues regarding the ownership of the integrated treatment model. The research needs to be designed to suit the fundamental principles of TM/CAM while preserving the scientific rigor. Other challenges include the possibility of harmful interactions, fear of one treatment mitigating or over-enhancing the effects of the other, such as using TM/CAM during chemotherapy, difficulty in selecting the appropriate methodology that is appropriate to the fundamental principles of both systems, fear of dominance by one system (integration/inclusion/co-existence) and competition for secondary resources. The perceived advantages of integrative approaches are multiple modalities to combat disease, the possibility of reduced chances of having dose-related side effects as the required drug doses could be less, the use of one system to overcome the limitations of another treatment regime, better outcomes, for example, stroke rehabilitation and more opportunities to design patient-individualised treatment models. To overcome the challenges development of a multidisciplinary research agenda is recommended along with appreciating and respecting each system’s fundamental principles, supplementing clinical level integrations basic science research and implementing national policies promoting integration.8

- Alcoholic and water extracts of the leaves of Withania somnifera possess considerable anticancer activities in vitro.8

- Cannabis sativa leaf is a common indigenous medicine in Sri Lanka. It is used medicinally for nausea, vomiting and to stimulate hunger during chemotherapy treatment. Cannabis is incorporated in Ayurvedic drugs after a purification process, which involves either soaking in hot water or milk and fried with ghee. The purification process increased tetrahydrocannabinolic acid and cannabidiol and decreased cannabinol and tetrahydrocannabinol, the principal psychoactive constituent of cannabis.9 In Sri Lanka growing, selling and possessing cannabis is punishable under the Poisons, Opium and Dangerous Drugs Act, but the law allows the use of cannabis for medicinal purposes. The traditional herbal medicine market in Sri Lanka currently depends on handouts from courts which seize illegally grown or smuggled drugs. Private Ayurveda physicians registered with the Ayurveda Department are allowed to use the drug in their products but the mixing of the drug has
to be done at the Ayurveda Drugs Corporation. The manufacturers can transport and distribute cannabis-based drugs only if the product is registered with the Ayurveda Department. There is a movement in Sri Lanka to pass laws to make cultivating cannabis legal for use in the Ayurveda medicinal industry.

- Candida isolates are susceptible to raw Allium sativum extracts which possess antifungal properties. Some opportunistic Candida species have developed resistance towards antifungal drugs prescribed to treat Candida infections.\(^{10}\)

- A cough syrup containing Glycyrrhiza glabra, Justicia adhatoda, Zingiber officinale, Solanum virginianum (yellow berried nightshade), Piper longum, Solanum melongena (eggplant) and Curcuma longa was observed to be effective for the management of chronic cough. Thirty patients were treated with 15mL of Hercough syrup two times a day for 14 days.\(^{11}\)

- Carica papaya leaf ethanol extract has in vitro antibacterial properties against Streptococcus pyogenes and Escherichia coli.\(^ {12}\)

- Cinnamomum verum (synonym Cinnamomum zeylanicum) (cinnamon), or kurandu, tree is reported to have originated in the central hills of Sri Lanka and Ceylon cinnamon is one of the earliest spices known to mankind and is traded around the world. A study aimed to trace the philological evidence to prove Sri Lankan territory as the country of origin of true cinnamon. The methodology was based on lexicons, ancient literary sources and scholarly publications in the history of cinnamon. There were numerous languages using the word for cinnamon, which is connected with Ceylon.\(^ {13}\)

- Other topics included leech therapy, traditional bloodletting therapy and non-pharmacological interventions such as yoga, meditation and medical astrology. There were numerous studies done on plants endemic and native to Sri Lanka not used in Western herbal medicine.

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A case of migraine headache successfully treated with low-dose magnesium phosphate in a pregnant woman

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Abstract
Magnesium supplementation is considered to be a safer and effective alternative to conventional drugs in the treatment and prevention of migraine headache. Trials to date demonstrate beneficial outcomes at low and higher doses. Higher doses, however, are associated with more adverse events. It is not clear how low-dose magnesium phosphate works, particularly in light of the fact that it isn’t clear if the supplement is bioavailable. A case is presented where a pregnant woman with recurring migraines was successfully treated with magnesium phosphate. The precautionary approach influenced the choice of this low-dose magnesium supplement as there are reasons to believe that excessive doses of magnesium may be deleterious in pregnancy, particularly towards the developing foetus. Energetic or placebo effects need to be considered in the interpretation of this outcome.

Keywords Supplements, magnesium phosphate, migraine headache, pregnancy.

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Introduction
Migraine is a headache characterised by a unilateral pulsating pain, worsening with activity and associated with nausea and vomiting, aura, photophobia and/or phonophobia.1,2

The aetiology of migraine includes genetic and multiple environmental factors. The pathophysiology is complex and includes neurologic, vascular, hormonal and neurotransmitter components.1

Common triggers are: emotional stress; intense physical exertion; abrupt weather changes; bright or flickering lights; high altitude; travel motion; lack of sleep; skipping meals; odours; certain foods and beverages, including aged cheese, chocolate, red wine, beer, coffee; food additives or preservatives, such as nitrates and monosodium glutamate.3

Individuals who suffer from migraines are more often female and may also suffer from or develop depression, anxiety, stroke, epilepsy, irritable bowel syndrome, or high blood pressure. Sufferers are also at an increased risk of developing early stroke and cardiovascular disease.3

Current medical management includes pharmacological treatments for the relief and/or prevention of symptoms. Drugs for symptom relief include non-steroidal anti-inflammatory drugs (NSAIDS), paracetamol, tryptans, opioids and metoclopramide (a dopamine antagonist). Preventers include beta-blockers such as propranolol; anticonvulsants such as sodium valproate and topiramate; tricyclic antidepressants and selective noradrenaline reuptake inhibitors and botox.3

Some of the risks associated with pharmacological treatment can be significant. For example, the long-term use of NSAIDS can lead to the erosion of gastric mucosa, renal injury and cardiovascular disease; beta-blockers may increase the risk of developing insulin resistance, dyslipidaemia, new onset diabetes and weight gain; tryptans are associated with medication-induced headache (medication overuse); anti-dopaminergic drugs can cause irreversible dystonic reactions; opioids may cause constipation, sedation and can be dependence...
Migraines are a common neurological disorder characterized by recurrent headaches. They are caused by a variety of triggers and can be severe, causing significant pain and disability. Magnesium may be considered as an alternative to these medications. Interest in magnesium started when an association of migraines with lowered serum magnesium was discovered. Clinical trials investigating the use of magnesium in the treatment and prevention of migraine attacks have yielded mostly favourable results. Apart from diarrhoea, few if any adverse effects occur.

Interestingly, low magnesium status is also associated with an increased incidence of diabetes mellitus, stroke, hypertension and hyperlipidaemia. Magnesium consumption in the form of hard water (a source of dietary magnesium which is unlikely to contribute more than 20% of the RDI) appears protective against cardiovascular disease. As mentioned earlier, migraine sufferers are more likely to suffer or develop these conditions. Therefore magnesium supplementation may help prevent some of the common underlying pathology.

Magnesium as an oral supplement comes in a variety of salt forms. Of the many products, a magnesium phosphate (65mg) supplement exists (Blackmores Celloid M.P.65) which contains a mere 13.4mg of elemental magnesium — a small fraction of other supplements.

A case is presented where low-dose magnesium phosphate appeared to result in a sustained clinically response in the management and prevention of the symptoms of migraine in a pregnant woman.

## Case report

### Presenting concerns

A 28-year-old, 18-week pregnant female and mother of a two-year-old daughter first presented to the student clinic at Endeavour on 1 September 2016 complaining of regular mild migraine headaches and constipation alternating with loose stools. At the time she was studying part-time and assisting her husband with the management of his business.

### Medical history

The patient had a long history of migraine. She has noted an association between her headaches and symptoms of bloating and constipation. Known triggers included the consumption of dairy products, caffeine and refined sugars.

Major debilitating migraines had developed every few months, the duration of which could extend to three days. Five years ago, she developed regular daily headaches, which commenced shortly after she was prescribed the combined oral contraceptive pill (Yasmin*) for the treatment of facial acne, and which subsided on cessation of the pill.

Recurrent tonsillitis occurred from the client’s childhood into her early 20s. These episodes were treated with antibiotics and did not require the removal of her tonsils.

Her first pregnancy, two years earlier, was eventful. She underwent an emergency C-section due to foetal distress. She breastfed her infant for three months, during which she suffered recurrent mastitis (treated with antibiotics) and thrush of the nipples. Shortly after the birth she developed symptoms of irritable bowel syndrome and intestinal dysbiosis, which had not fully resolved at the consultation. A trial of probiotics, digestive aids and gut healing products (Polybac 8, Digest Eze and Intestamine) several months earlier had improved the regularity of her bowel motions.

Prior to her second pregnancy she had a regular 30-day cycle. Her menstruation would include cramping in the first 24 hours, seven days of bleeding with up to 10 days at times, three days of which were typically heavy; she experienced symptoms of depression and cravings for chocolate and carbohydrates. She reported bouts of depression and becoming irrational and emotional when tired. These symptoms were worse at the beginning of the current pregnancy.

Her family history includes hypothyroidism in both her mother and father (the cause of which is unclear). Her mother is noted to have depressive tendencies. Both of her grandfathers died of smoking-related causes; her maternal grandmother died of breast cancer.

### Clinical findings

The present pattern of migraine headaches started about two months earlier (after the first month of the pregnancy). The headaches occur almost daily and develop gradually during the day, becoming most intense in the afternoon or evening. These daily headaches differ in intensity and duration from the previous infrequent debilitating migraine headaches, and are similar to the headaches that occurred while taking the oral contraceptive pill.

The pain is unilateral, felt across and behind the eye and temple, and is accompanied by mild light sensitivity, blurred vision and nausea. The severity of the headache is associated with symptoms of bloating and constipation; however, no association was noted with the symptoms of morning sickness, which had by this point resolved. The headache symptoms are exacerbated by poor sleep, and neck and shoulder tension.

Her mild migraine headaches (but not major migraines) respond to increased water intake and paracetamol. Acupuncture treatment has brought some relief of symptoms and severity.

Her bowel habits vary between loose stools three times a day to as little as one bowel motion twice a week. The consistency of the stools varies between Type 3 and 6 of the Bristol Stool Chart. No straining or discomfort occurs when defecating and she feels completely evacuated.

Acne regularly develops around her jaw and cheek bones. She notes that her symptoms have been worse since her pregnancy.
Physical examination

Her blood pressure was 108/60. There was mild vertical ridging and white spots on her nails; her tongue had a white coating with several cracks, scalloped edges and was quivering upon protrusion. Her facial skin appeared oily.

During the interview she appeared rather reserved and was difficult to engage in conversation. Open questions could lead to periods of silence and the shrugging of her shoulders. She sat slouching slightly forward.

Pathology results

A full blood count, serum UEC and LFT three months earlier revealed nothing abnormal.

A complete digestive stool analysis (through Australian Clinical Labs) in early April 2016 revealed a total absence of Bifidobacterium species and marginally low levels of Lactobacilli. Butyrate and valerate/isobutyrate were slightly elevated.

Diagnostic focus and assessment

The presence of acne and an oily face is strongly indicative that the client has a hormonal imbalance. This may be caused or excessive androgens and exacerbated by stress (psychological), dairy and high glycaemic index foods.13

Physical and/or emotional stress, changes in sleep patterns, hormonal fluctuations (rising progesterone of pregnancy) and food reactions were considered likely to be contributing to her migraines.14

The possibility of undiagnosed hypothyroidism exists either as a primary disease or a consequence of chronic stress. Symptoms suggestive of this include low blood pressure, symptoms of depression, lethargy and constipation. The chronic nature of the client’s constipation and depressive symptoms, in conjunction with a strong familiar history of hypothyroidism strengthens this suspicion.15 At the time of the initial consult, however, this was overlooked.

Therapeutic focus and assessment

As the client’s constipation correlated with the severity of the migraine attacks, herbs were used to improve the regularity and softness of the patient’s stools and improve liver detoxification of hormones (Cynara scolymus and Taraxacum officinale radix). Melissa officinalis was added to the mix as a mild nervine tonic and carminative and to improve gastrointestinal symptoms of bloating. Magnesium phosphate was specifically prescribed for the prevention and treatment of the migraine headaches.

As the client was pregnant, the herbs were cautiously dosed at half the recommended maximum dose and the magnesium supplement was chosen as it contains a low elemental dose of magnesium.

Follow-up and outcomes

7 September 2016

The patient reports that she has suffered no significant headaches during this period. The headaches started developing in the early hours of the morning but resolved soon after her morning magnesium dose. There have been no new breakouts of acne. Her energy levels had not improved (still 6/10) and her bowel movements remain similar to before.

Her treatment plan included the removal of gluten from her diet and a trial of progressive relaxation meditation of the head, neck, shoulders and arms. Her herbal mix and magnesium supplement were to continue as before.

22 September 2016

The client developed one debilitating migraine the previous week which lasted for twelve hours. The previous night she had little sleep. The headache symptoms did not respond to extra doses of the magnesium supplement (two tablets every two hours up to a maximum of twelve tablets per day). For the following two days she experienced mild headaches which did, however, respond to a higher dose of magnesium.

Her acne continues to improve and her bowel habits are now regular with a daily but harder stool. Her energy levels, however, have not improved and her tongue is still noted to quiver with slight scalloping along its lateral edges.

The treatment plan included stopping the herbal prescription, the value of which was no longer clear; there was an increase in protein-rich foods such as fish, eggs, chicken, lean meat and good-quality protein powder to support her stamina.

12 October 2016

The patient reported one headache in the last three weeks. Prior to this she was highly stressed and had poor sleep the night before. The symptoms persisted all day, the severity of which was ameliorated by taking extra doses of magnesium.

Her skin continues to improve; her bowel motions and energy levels remain similar to before. She notes to be suffering sugar cravings.

Discussion

Magnesium phosphate, albeit low dose, appeared to produce a striking improvement in the incidence and severity of daily migraine headaches.

The choice of magnesium phosphate over other supplemental forms was influenced by the clinical supervisor-practitioner’s reasoning that the supplement posed the least risk to a pregnant patient and is supported by her experience in prescribing the Blackmores Celloid range.

It is interesting to note that the use of magnesium phosphate as a supplement in humans is not supported by any published literature. A literature search on EBSCO Host (Alt Health Watch, AMED, CINAHL Plus with Full Text and MEDLINE Complete) revealed no published research examining the use of magnesium phosphate as an oral supplement, let alone in the treatment of migraine or related conditions.
The manufacturer of the product provides little information about the development of the Celloid product range, apart from the fact that it is the physiological dose equivalent of the ‘mineral-based’ homeopathic tissue salts of Wilhelm Heinrich Schuessler.\textsuperscript{16} Except for a scant mention in the literature that magnesium phosphate might be useful to treating a shooting type headache, trials on the homeopathic use of magnesium phosphate in migraine are also absent.\textsuperscript{17}

Magnesium phosphate as a supplement stands out amongst other supplements for having essentially no water solubility.\textsuperscript{19} Studies in cows have demonstrated that supplemental magnesium phosphate in the presence of acidity in the bovine digestive tract appears to ultimately gain a greater degree of solubility than magnesium oxide.\textsuperscript{19} Despite this, the supplemental feeding of magnesium phosphate is of little consequence when compared to magnesium oxide in the treatment of bovine hypomagnesaemia.\textsuperscript{20}

The high acid environment of the human stomach will predictably assist the solubility of magnesium phosphate. However, magnesium is absorbed chiefly in the ileum and jejunum and to a lesser degree in the colon. The pH of the intestinal lumen can vary from less acidic in the small intestine to alkaline in the colon.\textsuperscript{22} This does not necessarily mean that magnesium phosphate is not bioavailable in the human digestive tract, but in the absence of any human data, one cannot assume the supplement is bioavailable.

**Safety and risks of magnesium supplementation**

As mentioned earlier, magnesium supplementation is increasingly recognised as a safe alternative to conventional drugs in the treatment of migraine headache. Recently the American Headache Society has summarised Level B evidence suggesting that intravenous magnesium (single dose of 1-2g) in migraine with aura is effective.\textsuperscript{23}

A meta-analysis by Chiu and colleagues\textsuperscript{8} of 21 trials, suggests that whilst the evidence for oral or intravenous magnesium is not conclusive, it appears to be an effective agent that should be considered in the multimodal approach in the treatment and prevention of migraine headache.\textsuperscript{8}

A perusal of the results of the meta-analysis reveals positive results for intravenous doses of as little as 32mg magnesium as well as doses of several grams; positive results with oral doses of only 102mg of elemental magnesium (in the aspartate form) as well as high doses of over 500mg (as the oxide, citrate and propyl-valerate salts). For the purposes of comparison, the recommended daily intake of magnesium in pregnancy is 350mg.\textsuperscript{22} The most favourable results appear with higher doses, but there were also studies utilising higher doses that have not found favourable results. Part of this appears to be the inappropriate choice of oral magnesium sulphate, which is poorly absorbed and is used therapeutically as an osmotic laxative, not as a supplement.

Whilst multiple authors\textsuperscript{3,8,9} suggest that magnesium is a safe alternative to conventional treatment, there are unfortunately no quality long-term trials to substantiate this.\textsuperscript{8}

Animal studies examining non-cathartic doses of magnesium (doses that are insufficient to cause an osmotic effect) raise concerns over long-term safety in humans. Studies of rats suggest that high-dose magnesium supplementation can lead to femur bones of smaller diameter and low bone mineral density and content.\textsuperscript{24} In neonate lambs, magnesium supplementation appears to cause increased thirst and urolithiasis.\textsuperscript{23} It is not clear how to relate these findings to humans, but it raises suspicions that using magnesium in high pharmacological doses can disturb and interfere with the physiological management of calcium and perhaps other minerals in the human body, particularly in the developing foetus.

A systematic review performed by Makrides and colleagues\textsuperscript{26} examined the benefit of magnesium supplementation in pregnancy and found a slightly increased risk of neonatal death prior to hospital discharge in neonates of mothers taking magnesium supplements. The increased risk of death was due to severe congenital abnormalities in the magnesium group. Whilst causality to magnesium supplementation was not established, it would be prudent to ensure that magnesium supplementation was of the smallest dose and duration necessary in pregnant women.

There is, however, one more dimension that needs to be discussed. The questionable bioavailability of magnesium phosphate opens up the possibility that the client may have responded as a consequence of the placebo effect.

A Cochrane review by Hrobjartsson and Gotzsche\textsuperscript{27} concluded that the placebo effect is of little clinical relevance, except perhaps for the symptoms of nausea and pain. The evidence to support a clinically significant effect of placebo in nausea and pain is itself conflicting and only moderate in the best case scenario. This case deals with pain and nausea in the form of a migraine headache. The patient reported an almost total relief of headache and nausea when taking paracetamol or increasing water intake: minor migraines responded, but not major migraines. On the other hand, the client is a student of nutrition with a good understanding of biochemistry. It is likely that she understood that the dose of magnesium used to treat her migraines was small. It is therefore difficult to judge whether the placebo effect was relevant to this case. Further research investigating the effectiveness of magnesium phosphate against placebo is needed to control the placebo effect in treatment of migraine in pregnancy.
Summary
Low-dose magnesium supplementation (in the form of magnesium phosphate) appears to be a safe and promising therapy that could be considered in the prevention and treatment of migraine headache in pregnant women. Trials do not indicate an optimal therapeutic dose and long-term safety data is lacking. Animal studies suggest that caution should be exercised when using higher non-cathartic doses of magnesium, particularly in pregnant women. Given the positive results experienced by this client, further research using this form of low-dose magnesium is recommended.

Conclusion
This case study suggests that low-dose oral magnesium phosphate may be a safe and effective option when treating migraine headache in pregnant women. At present, however, there is no published evidence to support the use of magnesium phosphate as a supplement or oral therapeutic agent in humans and its bioavailability is yet to be demonstrated in humans. Evidence of an energetic effect was also possible and a placebo effect could not be ruled out.

References
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Severe allergic rhinitis, perennial sinusitis and antihistamine dependence resolved with naturopathic treatment: A case study and short literature review

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Abstract
Allergic rhinitis is very common in Australia, and 20% of those who suffer from this also have perennial sinusitis. Histamine release is what causes inflammation and the commonly experienced symptoms of nasal congestion, runny nose, sneezing, itchy nose, throat and palate, as well as watery, itchy and red eyes. There is a small amount of clinical evidence for the use of honey in these cases; however, a low histamine diet may also improve patients’ symptoms and little research has been done to confirm the effectiveness of naturopathic interventions. This paper presents a case of severe allergic rhinitis, perennial sinusitis and antihistamine dependence where naturopathically prescribed nutritional supplements, herbal medicines, honey and a low histamine diet had an improvement on the patient’s symptoms and pharmaceutical antihistamine reliance sustained for at least two years.

Conflicts of interest
Jackie is a current board member of ARONAH and lectures at Southern School of Natural Therapies (SSNT) in nutrition and iridology subjects. SSNT is part of Think Education which is part of Laureate international.

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Introduction
Hay fever, also known as allergic rhinitis, is very common. In fact, Australia and New Zealand have the highest incidence of it in the developed world. Its most common symptoms are nasal congestion, runny nose, sneezing, itchy nose, throat and palate, as well as watery, itchy and red eyes. Approximately 20% of those with allergic rhinitis also have perennial sinusitis. Perennial sinusitis is characterised as a persistent congested nasal cavity, regardless of season or time of year. Sleep disturbances have been associated with both hay fever and perennial sinusitis, which can have a substantial impact on efficiency and cognitive functioning, as well as emotional wellbeing. Additionally, untreated perennial sinusitis has been associated with asthma, polyps, and otitis media, which have more serious implications for a person’s health.

Histamine elicits a range of effects including vasodilation, increased permeability of blood vessels, mucus secretion, as well as changes in blood pressure, tachycardia, and may exacerbate (or complicate) heart arrhythmias. An enzyme diamine oxidase (DAO), breaks down histamine so its effects are not prolonged. Low levels of DAO compared to histamine may facilitate a build-up of histamine in the body, or a normal level of DAO may be unable to break down a very high level of histamine. Sustained non-metabolism of histamine can increase the risk of a histamine intolerance. Deficiency of DAO may be genetic or acquired, and if it is acquired it may be reversed.

Histamine has been associated with asthma, polyps, and otitis media, which have more serious implications for a person’s health.

The pathogenesis of allergic rhinitis and perennial sinusitis is mediated by degranulation of mast cells and the release of histamine. Histamine is an amine produced in many of the body’s immune cells, but most well-known for its production by mast cells. Mast cells release histamine in response to an allergen. This is called degranulation. It is histamine and the subsequent inflammation and irritation of cells that produces the uncomfortable symptoms which have been outlined above.
prevent the release of histamine from mast cells. However, long-term antihistamine use (more than three years) has been associated with an increased risk for the development of dementia.6

Naturopathic patients are also often looking for a more holistic, natural and preventative approach. Reid, Steel, Wardle, Trubody and Adams7 found that people with a lower quality of life due to chronic illness are more likely to use complementary medicines compared to those who don’t have chronic illness. As perennial sinusitis as a chronic disease, people are likely to seek naturopathic treatment and care.7

A naturopathic approach includes addressing any nutritional deficiencies that may negatively impact on the balance between histamine and DAO. Low levels of DAO may be caused by lack of nutritional cofactors essential for production. These include pyridoxine (B6), vitamin C, zinc and copper.4 Antihistamine drugs (such as fexofenadine, cetirizine, diphenhydramine) inhibit the DAO enzyme.3,4 Other common pharmaceuticals which may inhibit DAO are morphine, acetylsalicylic acid, some antibiotics, (cefuroxime, cefotiam, izoniazid, pentamidin, clavulanic acid, choroquine) some antihypertensive drugs (verapamil, alprenolol, dihydralazine), some diuretics (amiloride), mucolytics (acetylcysteine, ambroxol) and bronchoctytics (aminophylline), and some antidepressants (amitriptyline).3

Histamine is a natural constituent of some foods. Examples include fish and cheese. Food processing methods may also increase the histamine content in foods including fermentation used to produce foods like sauerkraut, red wine and champagne.3,4 If a high amount of dietary histamine is consumed, histamine may build up in a person’s body quickly. Some food may stimulate the release of histamine directly from mast cells. Foods such as citrus fruit, bananas, pineapple, strawberries, tomatoes, spinach, nuts, fish, pork, egg white, chocolate, and spices all do this in sensitive individuals.3,4 Red wine is a special case, as it is high in histamine and also inhibits DAO enzyme.3,4 Even small amounts of histamine ingested through the diet can cause severe symptoms of sneezing, runny nose, nasal congestion, headaches and asthma in people with a histamine intolerance. Symptoms can come on very quickly, during or immediately after ingesting food.3

The following case study illustrates the resolution of perennial sinusitis through a naturopathic treatment approach rationalised by balancing histamine and DOA, improving mucous membrane tissue integrity and normalising the immune response.

Case presentation

Presenting concerns

In September 2015, a 34-year-old woman presented to the naturopathic clinic with severe allergic rhinitis and perennial sinusitis. Symptoms were worse in spring and autumn, but low-grade sinus congestion persisted through all the seasons of the year.

Symptoms involved itchy and watery eyes, severe sneezing, occasionally an itchy throat, and severe sinus congestion. The patient reports she has allergies to grass, dust, horses, dogs and cats. She had noticed her symptoms are worsened by chilli and wine (but loved to drink it). These symptoms persisted with the ongoing use of daily antihistamine pharmaceuticals.

The patient wanted naturopathic treatment to reduce symptoms of the perennial rhinitis and to reduce her reliance on antihistamines.

Case history

The patient’s allergic rhinitis and perennial sinusitis started in her teens. Desensitisation with immunoglobulin therapy had been undertaken five years earlier. The patient explained that her asthma (since childhood) had greatly improved, even though she had a major skin reaction during the sensitivity testing. The patient reported high energy levels (8/10).

Notable family history

Her father has skin allergies and asthma; her sister has eczema and IBS.

Medications and supplements

One antihistamine (Cyproheptadine) twice per day.

An asthma preventative (salmeterol) daily as well as a reliever (salbutamol) as needed.

Combined oral contraceptive pill (levonorgestrel and ethinyllestradiol).

Nutritional supplements: magnesium and fish oil from her home supply (dose and amounts unknown).

Iron supplements (past three months).

The patient used isotretinoin (Roaccutane) in her teens and late 20s to treat moderate acne.

Lifestyle (diet and exercise)

The patient’s diet was generally very healthy, with a variety of fresh fruits (a particular love for banana) and vegetables. She ate all grains, and had dairy products daily (yoghurt, milk, cheese), as well as meat (fish, chicken, red meat). She drank two litres of water per day, four caffeinated drinks (coffee and tea) as well as a green tea. Her appetite was good.

The patient exercised on most days for an hour, with gym three times per week, walking four times per week, and yoga once per week.

Systems function

The patient’s digestive system was reported as unremarkable apart from her stools being described as ‘very soft and fluffy’. She moved her bowels once per day. Occasionally the patient felt bloated and she reported getting a head cold on average once per year.

She was recently diagnosed with iron deficiency anaemia and had been taking iron supplements for the previous three months.
Iris examination
The patient’s blue iris (Figure 1) showed a grade 3 structure, with many white fibres throughout as well as white clouding concentrated in the humoural zone (zone 3) and some the blood and lymph zone (zone 5). The patient also has a predominant scurf ring (not seen in the high-resolution photo).

Development of a naturopathic treatment
A naturopathic prescription that addressed the patient’s presenting symptoms as well as an underlying exacerbating factor of excessive inflammation shown by the iridology findings was developed. Specifically the treatment aimed to support healthy immune system function, mucous membrane tone and provide co-factors for DOA synthesis. Individualised dietary advice, including food as medicine, nutritional supplements and herbal medicines were prescribed. The iris signs that specifically informed the treatment were the abundant white fibres and clouding of the entire iris (Figure 1).

Medicinal foods
The patient was advised to have a teaspoon of local honey per day, either in her herbal tea or on its own. Honey and bee pollen have been shown to decrease mast cell activation in animal studies and improve allergy symptoms in humans.

Follow-up consultation at two months (October 2015) and three months (November 2015)
The patient had been very compliant and followed all of the recommendations.

Her dose of antihistamines had been reduced to one tablet in the morning.

No further improvements were observed in November 2015.

Follow-up consultation at four months (December 2015)
The patient reported that the improvements in her sinusitis and allergic rhinitis had plateaued after the third month of treatment. The treatment was adjusted in the fourth month to include a targeted digestive system approach. Probiotic supplementation with *Saccharomyces boulardii* (250mg equivalent to 5 billion colony forming units (CFU)) was given once per day for two weeks, then after two weeks, a broad spectrum probiotic was introduced. This was taken separately to the *Saccharomyces boulardii*, once per day for two weeks. Then the *Saccharomyces boulardii* was ceased, and the probiotic was given on its own for two weeks.

The broad-spectrum probiotic supplement contained:

- Bifidobacterium lactis Bl-04 3 billion organisms
- Lactobacillus gasseri Lg-176 100 million organisms
- Lactobacillus rhamnosus HN001 5 billion organisms
- Lactobacillus plantarum Lp-115 5 billion organisms
- Lactobacillus casei Lc-11 500 million organisms
- Lactobacillus acidophilus La-14 5 billion organisms
- Streptococcus thermophilus St-21 500 million organisms
- Bifidobacterium longum BI-05 3 billion organisms
- Bifidobacterium breve Bb-03 2 billion organisms
- Lactobacillus salivarius Ls-33 400 million organisms
- Bifidobacterium infantis Bi-G201 400 million organisms
- Lactobacillus delbrueckii ssp bulgaricus Lb-64 100 million organisms

At this time the patient also reported noticing a link between her symptoms, her antihistamine use and the honey. She had not taken the honey for two days and needed extra antihistamines on those evenings.

An antihistamine diet was introduced. The rationale was that an antihistamine diet may induce and support balance of histamine and DAO and result in the patient’s system being able to efficiently metabolise histamine. The antihistamine diet advice provided to the patient

Nutritional supplements, herbal medicines, diet and lifestyle advice
A zinc supplement containing total elemental zinc 30mg and co-factors vitamin A 600ug, vitamin C 150mg and vitamin E 50IU (41.3mg) was recommended at 1 tablet per day.

Vitamin C 2000mg per day.

A herbal tablet containing *Albizia lebbeck* 800mg, *Scutellaria baicalensis* 800mg, *Tanacetum parthenium* 50mg 1 tablet twice per day.

The patient was advised to continue taking magnesium and fish oil supplements from her home supply.

Diet
The patient was advised to cut down on banana, and replace it with pear as banana is purported to increase mucous production in the sinuses while pear breaks it down. She was advised to reduce dietary intake of milk from cows containing A1 casein (protein) and substitute with cow’s milk containing A2 casein or plant-based milk. She was also advised to reduce her caffeine intake from four cups of tea and coffee per day to one or two.

The patient was also advised to air out her bedding (including the mattress) in the sunlight (UV radiation) to kill dust mites.

Figure 1
Right eye  Left eye
included restricting intake of foods containing histamine, foods that may increase histamine release and foods that may inhibit DAO, including fruits (citrus, strawberries, kiwi, and pineapple), vegetables (tomatoes and beans), pulses, nuts, red wine and tea. The patient was also advised to avoid processed and tinned foods. She was asked to increase her intake of low histamine foods including all other fresh vegetables and fruits (avoiding those mentioned above), fresh meat (not tinned) and some grains (rice and oats). Specific dietary advise provided to the patient is detailed in Appendix 1.16

The procedure was to continue with the diet for two weeks while maintaining the antihistamine pharmaceutical use and to cease the antihistamines in the third week. Due to the proximity to Christmas, patient decided to start the diet in late January 2016.

Follow-up consultation six months (February 2016)

Following the food elimination and reintroduction process, the patient noticed some clear links to particular foods, particularly chilli.

After one week on the antihistamine diet the client had stopped all antihistamine medications. On the day of antihistamine cessation the patient reported sneezing three to four times and then no more sneezing for three to four days. She had a spicy chicken salad and sneezed 15 times at lunch, and a clear link with spicy food was established.

The client reported no antihistamine use for almost two weeks.

Her bowel frequency had also increased to twice to three times per day.

Follow-up consultation at seven months (March 2016)

By the fourth week of the diet, the patient had started introducing foods back into her diet. Half of the mornings the patient had sneezed and was required to blow her nose but only four antihistamines had been taken over the entire month. The patient was motivated to continue the diet as strictly as necessary.

The patient also reported she needed less sleep (one hour) in order to function throughout the day and was very happy with this gift of time.

Follow-up consultation at eight months (April 2016)

By the eighth month of treatment, the patient was introduced to a maintenance program that consisted of continued vitamin C supplementation. The herbal tablet and zinc supplement were phased out.

It was recommended that the patient adhere to the antihistamine diet once per year if needed, to reset and ‘empty her tank’ of histamine. Treatment was concluded and ceased.

Follow-up at two years (August 2017)

The patient reported managing her symptoms by avoiding trigger foods, mainly wine, canned foods, and dairy, and was only using one antihistamine tablet per month.

Discussion

This case of allergic rhinitis and perennial sinusitis was effectively managed by a multifaceted naturopathic treatment. The treatment was aimed to strengthen and repair mucous membranes, reduce inflammation and balance the immune response and improve digestive ecology and function and immunity. There were two significant aspects of the case study that suggested some parts of the treatment plan were crucial to achieving treatment success: the use of honey and the introduction of a low histamine diet.

Honey

There are several theories as to why honey may be effective in the treatment of allergies and acute rhinitis. Firstly, honey has been shown to suppress IgE antibody responses in vitro, and degranulation of mast cells in vivo. Secondly, honey contains low levels of pollen and it is hypothesised that the exposure to these low levels may desensitise the body to allergens and enhance tolerance. Thirdly, honey may have anti-inflammatory properties. The airway opening effects of honey are postulated to be due to an anti-inflammatory action.

Two clinical trials have demonstrated that honey is superior to placebo with reducing the symptoms in people with allergic rhinitis. The effects of honey against placebo in people with allergic rhinitis were investigated in a double-blinded, randomised control trial in Malaysia, over eight weeks. All participants also took an antihistamine tablet for four weeks into the trial and then ceased. The honey and placebo dose was individualised according to body weight, with one gram per day prescribed per kilogram bodyweight. Following the cessation of the antihistamine, significant improvements were shown in the group taking the honey compared to placebo controls for the total score of allergic rhinitis symptoms and for the following specific cardinal symptoms sneezing and nasal itchiness.

There are a few notable limitations of this study. Firstly, the study was conducted in Malaysia so may not be generalisable to the population of Australia. The honey used was batch-specific and not commercially available, so findings may be limited to the specific honey used and they study was only carried out over only eight weeks, and long-term improvements were not investigated. However, the randomisation of this study showed no differences in symptoms between the groups at baseline, and the significant differences between groups after eight weeks on treatment indicates that the honey had a significant impact on reducing the allergic rhinitis and on specific associated symptoms.

In another randomised control trial, two forms of honey were investigated against placebo over five months in Finland. The two forms of honey were: 1) regular honey; and 2) honey inoculated with bee pollen. The honey was self-administered with up to one teaspoon per
day for five months prior to spring (hay fever season) and ceased during spring. Outcomes included the number of antihistamines used during hay fever season and number of symptom-free days. Both honey groups reported more symptom-free days than the placebo group. The group taking the honey with bee pollen reported significantly more symptom-free days compared to the control group (p<0.001) and significantly less antihistamine use (p<0.001).14

There were some limitations of this study. Firstly, the control group received no placebo, and although they were advised not to consume honey during the data collection phase, there is no guarantee that this occurred. Secondly, the outcomes were self-reported by study participants in a symptom diary, which was not a validated instrument and not necessarily a reliable assessment method. Thirdly, although the participants were randomised, similarities and differences of the three groups were not described at baseline. For example, the number of participants who smoked and their group of assignment was not reported and a different proportion of smokers in any of the three groups could have an impact on the outcomes over and above the honey intervention. However, the strengths of this study included the longer duration of six months, and the ‘real-world’ characteristics of the sample, and findings that may be generalised to people with allergic rhinitis.14

Low histamine diet

The progression of naturopathic treatment effectiveness in this case suggests that the low histamine diet that the patient followed was pivotal in the cessation of antihistamine medication and significantly improved health. There have been very few investigations into the effectiveness of a low histamine diet for treatment of perennial sinusitis. A comprehensive review of the potential mechanisms of effect based on pre-clinical evidence and a list of histamine-containing foods is outlined in two review articles by Maintz and Novak1 and Kovacova-Hanuskova, and colleagues.4 A full comprehensive list of these recommendations can be found at http://www.histamineintolerance.org.uk.16

Conclusion

The initial naturopathic treatment consisting of nutritional supplements and herbal medicines reduced the patient’s sinusitis and antihistamine use; however, more work was needed to impact the continued symptoms of perennial sinusitis. Following the introduction a short course of probiotics, daily intake of honey and an antihistamine diet, the patient’s chronic use of antihistamine medications ceased and her allergic rhinitis and perennial sinusitis completely resolved. The naturopathic treatment facilitated the patient’s engagement and self-care in the resolution of a chronic debilitating condition.
Appendix one

Patient handout — Antihistamine diet

The following information was taken from http://www.histamineintolerance.org.uk

General tips:

• Avoid canned foods
• Avoid prepackaged meals
• Avoid ripened foods
• Avoid fermented foods (older cheeses, alcoholic drinks, products containing yeast, stale fish)
• As much as possible, only eat fresh products

Histamine levels in foods vary, depending on how ripe, matured or hygienic the foods are.

Don’t allow foods to linger outside the refrigerator — especially meat products.

Low histamine level foods — eat these the most.

• Fresh meat (cooled, frozen or fresh)
  Freshly caught fish
• Chicken (skinned and fresh)
• Egg yolk
• Fresh fruits — with the exception of strawberries, most fresh fruits are considered to have a low histamine level (also see histamine liberators below)
• Fresh vegetables — with the exception of tomatoes
• Grains — rice noodles, yeast free rye bread, rice crisp bread, oats, puffed rice crackers, millet flour, pasta (spelt and corn-based)
• Fresh pasteurised milk and milk products
• Milk substitutes — coconut milk, rice milk
• Cream cheese, butter (without the histamine generating rancidity)
• Most cooking oils (olive oil and coconut oil are good choices)
• Most leafy herbs
• Most non-citric fruit juices
• Herbal teas — with the exception of those listed below

High histamine level foods:

• Alcohol
• Pickled or canned foods — sauerkrauts, kimchi
• Matured cheeses
• Smoked meat products — salami, ham, sausages
• Shellfish
• Beans and pulses — e.g. chickpeas, soy beans, peanuts
• Nuts — walnuts, cashew nuts
• Chocolates and other cocoa-based products
• Vinegar
• Prepackaged meals
• Salty snacks, sweets with preservatives and artificial colourings

Histamine liberators:
• Most citrus fruits — kiwi, lemon, lime, pineapple
• Plums and strawberries
• Papaya
• Tomatoes
• Cocoa and chocolate
• Nuts
• Beans and pulses
• Wheat germ
• Additives — benzoate, sulphites, nitrites, glutamate, food dyes

Diamine Oxidase (DAO) blockers: (DAO is an enzyme which breaks down histamine)

• Alcohol
• Black tea
• Energy drinks (not good to have these anyway)
• Green tea
• Mate tea

Debatable:

• Yoghurt — depends on the bacteria culture used
• Egg white — it is a histamine liberator only when in its raw state

Other

• Yeast — even though it does not contain histamine as such, yeast serves as a catalyst for histamine generation during manufacture. There is no yeast in the end product.
References


Introducing a NEW Herb to the OptimalRx Range

Fumitory

*(Fumaria officinalis)*

Fumitory is a small annual British native plant belonging to the Fumariaceae family, a subfamily of the Poppy family. Traditionally, Fumitory was noted for its cleansing properties, as well as its tonic, diuretic, aperient, and laxative properties, and therefore it was valued for treating eruptive skin conditions. Several traditional systems of medicine, such as Ayurvedic and Unani, have esteemed Fumitory as a cholagogue, antispasmodic, and hypotensive. In modern times, Fumitory is utilised as an alterative, amphicholeretic, bitter, cholagogue, digestive tonic, laxative, and spasmolytic. Due to its amphicholeretic nature, Fumitory is considered most useful in regulating gallbladder motility and improving gallbladder health. Therefore, Fumitory is often prescribed for the management of biliary colic, biliary dyskinesia, biliary dyspepsia, biliary migraine, chronic cholecystitis, gastro-oesophageal reflux disease (GORD), indigestion, eczema, psoriasis, and skin eruptions.

For further information go to www.optimalrx.com.au to download the tech sheet.
Reviews of articles on medicinal herbs

Jodie Tester

These abstracts are brief summaries of articles which have appeared in recent issues of herbal medicine journals, some of which may be held in the NHAA library.

**Artichoke extract protects against alcohol-induced liver injury in mice**


Alcoholic liver disease (ALD) is the leading cause of cirrhosis and liver-related death worldwide and is estimated to be responsible for 4% of global mortality. ALD encompasses a histological spectrum of liver injury from steatosis to alcoholic steatohepatitis (ASH) to fibrosis, cirrhosis and ultimately hepatocellular carcinoma. Potential mechanisms of acute alcohol-induced liver injury include oxidative stress, steatosis, endotoxin, immunity, and inflammatory mechanisms. Control of ALD at an early stage, such as prior to the occurrence of ASH, may play a role in preventing the development of ALD. Artichoke (*Cynara scolymus*) is an edible herbal medicine, previously studied for its possible antioxidative and hepatoprotective effects. Authors of the current study aimed to assess the preventive effects of ethanolic extract from artichoke on acute alcohol-induced injury in mice.

Male Institute of Cancer Research (ICR) mice were randomly divided into 6 groups of 10: Control; EtOH group (model group); Positive control (EtOH + bifendate); Low-dose artichoke group (EtOH + artichoke 0.4g/kg BW); Middle-dose artichoke group (EtOH + artichoke 0.8g/kg BW); High-dose artichoke group (EtOH + artichoke 1.6g/kg BW). Alcohol administration was with 12mL/kg BW one hour after bifendate or artichoke pre-treatment each day. All groups were fed for 10 consecutive days.

For serum biochemical markers, experiments found that artichoke extract significantly prevented elevated levels of aspartate aminotransferase (AST), alanine aminotransferase (ALT), triglyceride (TG) and total cholesterol (TC), in a dose-dependent manner compared with the EtOH group. ALT, AST, TG and TC are early biochemical and pathological markers of hepatocyte damage. Additionally, decreased levels of superoxide dismutase (SOD) and glutathione (GSH) were elevated by artichoke administration, both of which protect against reactive oxygen species caused by oxidative stress in alcoholic liver injury. In further experiments, it was found that compared to EtOH group, artichoke extract also significantly attenuated degeneration and necrosis of hepatic cells. It was noted that the dose of 1.6g/kg BW artichoke exhibited significant preventative potential for acute alcohol-induced liver injury, whereas the low-dose artichoke level of 0.4g/kg BW was not significant.

With alcoholic liver disease and alcohol-induced liver injury contributing to a significant health burden, the findings of a potential protective benefit of artichoke supplementation warrant further investigation. Future research to better understand and demonstrate efficacy, safety, optimal dosing, and outcome measures in humans is required.

**Zizyphus complex not found to improve sleep quality in insomnia**


Insomnia, defined by disturbances in sleep quality together with impairment of daytime functioning, is estimated to effect between 13-33% of Australians. Insomnia can range from acute and non-clinical to chronic and long-term. Whilst acute episodes will often resolve once the trigger is eliminated, many people will use short-term use of pharmaceutical medications such as benzodiazepine, or herbal supplements during these episodes.

Numerous herbal supplements have been studied with respect to their effect on sleep. The current study reports the results of a clinical trial which was designed to investigate the short-term effect of a combination formulation, LZComplex3 on sleep quality, mood and cognitive function in individuals with sleeping difficulties not caused by a primary sleeping disorder or other diagnosed conditions. The intervention contained Lactium™ (hydrolysed milk protein; alpha casozepine enriched), *Zizyphus jujube var. spinosa*, *Humulus lupulus*, magnesium oxide and vitamin B6. Participants were randomly allocated to receive the active intervention or a matched placebo. After a one week placebo run-in, patients completed a two-week course of either placebo or LZComplex3 and were instructed to take two tablets daily, 30 minutes before retiring for sleep.

Participants eligible for study included were healthy adults aged 18–65 years with no significant diagnosed disease, who had self-reported sleeping difficulties.
over the previous one month. Those with primary sleep disorders including sleep apnoea-hypopnea, narcolepsy, restless leg syndrome and Kleine-Levin syndrome were excluded. Assessments of sleep quality, daytime functioning and physical fatigue, mood and anxiety, stress reactivity, and cognitive function were completed by participants during the baseline and end of treatment visits. Participants also complete all subjective sleep, daytime functioning, physical fatigue, mood and anxiety assessments at home on days 1, 3 and 7 after baseline.

Of the 241 people screened for eligibility and the placebo run-in period, 171 participants were randomised to treatment, of which the modified intention to treat population included 160 participants (placebo n=82, LZComplex3 n=78). After two weeks supplementation, there were no differences between groups in the primary outcome of change in overall sleep quality from baseline despite observed improvements in sleep quality. Furthermore, the secondary outcomes measured including daytime functioning and physical fatigue, mood and anxiety, cognitive performance and stress reactivity did not support a benefit of LZComplex3 over placebo.

Strengths of the study include its use of the placebo run in period designated to identify and exclude placebo responders. It is noted by authors that the two-week treatment duration may not have been sufficient to observe a treatment effect. Furthermore methodological limitations including sleep disorder allocation and misclassification of acute and chronic conditions may have impacted results. The importance of studies reporting negative efficacy results is essential to ensure quality of prescribing and to better understand the ideal patient population, and optimal durations of treatment.

**Peppermint and caraway oil in functional dyspepsia**


Functional dyspepsia (FD) is a common condition thought to affect more than 10% of the population. FD is defined by symptoms of the upper gut such as epigastric pain or burning, early satiation, and postprandial epigastric fullness. Complementary or herbal treatments are widely used in FD. The current study investigated the symptomatic relief and impact on quality of life (QOL) of a peppermint and caraway oil combination in patients with FD.

The study was a prospective, double-blind, multicentre trial conducted in an outpatient setting of general practitioners and physicians in Germany. Adult subjects of either sex with chronic or recurrent FD, persisting for at least 6 months with the current episode lasting for at least 1 week, were eligible for study inclusion. Patients were not eligible for the study if they had gastroesophageal reflux disease (GERD) or predominantly symptoms of GERD, functional dyspepsia of reflux type, or predominantly symptoms of IBS. Exclusion criteria also included concomitant medication with potential influence on outcome measures including prokinetics, agonists and antagonists of GI hormones, acid-reducing drugs, sedatives, laxatives, non-steroidal antiinflammatories, opioids, calcium antagonists and any other herbal preparations. All patients had a one-week placebo run-in period. Eligible patients were then randomised to receive either 2x1 capsules per day of the active intervention or matching placebo, with treatments to be taken at morning and noon, before meals. The active intervention was a fixed peppermint (90mg)/caraway(50mg) oil combination (Menthacarin). Active intervention lasted for 4 weeks with post baseline assessments performed after two weeks and at the end of treatment.

Of the 128 patients included in the run-in phase, 114 were randomised (1:1) to active treatment or placebo. After two weeks of therapy, the active intervention showed significant improvement of FD symptoms from baseline, compared to placebo. From baseline to end of treatment at 4 weeks, the average symptom score decreased by 62.3% and 26.0% for the active and placebo groups, respectively. Furthermore, the peppermint/caraway combination had a significant effect on disease-specific QOL. The interventions were well tolerated.

With a prevalence of dyspepsia estimated to range between 20-30% in the Western world, a significant number of whom may be suffering from FD. Accordingly, FD remains a significant burden to the healthcare system. Safe and effect treatments that not only provide symptomatic relief, but further improve quality of life are of great interest. The current study provides evidence to support a beneficial role of peppermint oil and caraway oil in providing relief from gastrointestinal symptoms of functional dyspepsia.

**Anti-obesity effect of Panax ginseng in obese rats**


Obesity is a major public health issue worldwide, with concurrent increase in incidence of metabolic diseases. Whilst many studies have investigated potential treatments for obesity, pharmacological agents for long-term obesity treatment are limited. Strategies for the prevention of obesity, including functional foods and plants, are therefore of great importance.
The root of ginseng has been used traditionally for the treatment and prevention of a variety of conditions. Roots of *Panax ginseng* (Korean ginseng) have previously demonstrated to exhibit anti-adipogenic activity in *in vitro* research. The aerial parts of Korean ginseng are less well understood in terms of pharmacological and anti-obesity effects. The current study examined the anti-obesity effect of leaf extracts of Korean ginseng in high-fat diet (HFD)-induced obese rats.

The study used leaf extracts of ginseng (three years old) prepared from young, green leaf (GL) or old, dried leaf (DL), with leaf samples extracted with distilled water. Six week old male Sprague-Dawley rats were randomly assigned to the following groups: normal diet (ND); HFD; HFD + GL supplementation (3.3mg/kg); and HFD + DL supplementation (3.3mg/kg). Each group had seven rats. GL and DL were administered orally on each day of the experiment period. Blood was collected on the final day of experiments for measuring plasma marker levels of nephrotoxicity, hepatotoxicity, and lipid profiling.

At the end of the experiment, the final body weights of GL- and DL-supplemented rats were slightly lower than those of HFD; however, this did not reach statistical significance. The abdominal and epididymal adipose tissue mass was significantly decreased in the GL- and DL- rats compared to the HFD fed rats. Markers of renal and liver function were similar between HFD-fed rats and HFD-GL and HFD-DL rats. Plasma triglycerides and LDL-cholesterol levels were reduced in the GL- and DL- rats compared to control whilst HDL-cholesterol was also increased in the HFD-DL group.

Cell line testing examined the potential mechanisms of action of the herbs. The DL-leaf extracts of Korean ginseng were found to suppress the adipogenesis of the adipocytes through modulation of central transcription factors. The GL-extract, however, was thought to exert its effect through metabolic modulation or increased energy expenditure. Further research is required to establish the mechanism of action of ginseng in this therapeutic area, and to understand differences between the effect of old and young leaf. As obesity continues to be a significant health problem, advances in this area of research are greatly needed.

**Saffron extract in healthy adults with low mood**


Mental health disorders are a leading cause of disability and health and economic burden. Lifetime prevalence of anxiety, mood or substance use disorders is estimated to be at 45% in Australia. Low mood can be defined by many of the same symptoms as depression including sadness, fatigue, pessimism, changes in appetite, changes in sleep patterns, and anhedonia, yet prescription medications are not appropriate in these instances. Interest in alternative therapies has become a point of interest for management of low mood.

*Crocus sativus L.*, commonly known as saffron, has been a focus of research over recent years for its potential as a treatment for mood disorders and depression. Proposed mechanisms of action for saffron include inhibiting re-uptake of dopamine, serotonin and noradrenaline, and as an antioxidant. The aim of the current research was to evaluate the effect of a standardised saffron extract on mood for four weeks in a healthy population reporting low mood in a randomised, double-blind, placebo-controlled trial.

The active treatment was a standardised saffron extract (affron® Pharmactive Biotech Products) derived from *C. sativus L.* stigmas which was standardised to contain >3.5% Lepticrosalides, a measure of the bioactive compounds present in saffron including safranal and crocin. The study was conducted in Brisbane, Australia, with participants recruited through public media and a subject database. Participants were eligible for inclusion if they were self-reporting low mood, were not diagnosed with depression or another mood disorder, and were otherwise healthy (BMI <30). Exclusion criteria included diagnosis with a mood disorder, or had tested positive for depression on the Beck Depression Inventory (BDI >20). In total 128 participants were enrolled and randomly allocated to receive saffron 28mg/day, saffron 22mg/day or placebo for four weeks. Mood was measured at baseline and at the end of study using Profile of Mood States (POMS), the Positive and Negative Affect Schedule (PANAS), and the Depression Anxiety Stress States (DASS-21 scale). Sleep was monitored using the Sleep Quality Index (PSQI).

Authors reported a significant decrease in negative mood and symptoms related to stress and anxiety at the 28mg/day dose compared to placebo. No significant between-group treatment effect was noted for positive effect in PANAS. No significant improvement was observed in sleep quality in any treatment group. No treatment effect was observed at the 22mg/day dose. The significance of changes from baseline to end of study within groups were not well reported.

Limitations of the study include its self-reporting nature, possible confounding effects, and the healthy population use. Additionally, the statistical reporting did not provide *p* values for all study parameters reported limiting interpretation of the reported findings. Whilst the study demonstrated effectiveness of the saffron extract in improving low mood and stress in an otherwise healthy population, more research is required to fully understand its potential for appropriate clinical use in this patient population.
References


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Reviews of medical journal articles

Jodie Tester

These abstracts are brief summaries of articles in recent issues of medical journals. Articles selected are of a general nature for the information of practitioners of naturopathy and herbal medicine. A dominant theme is often present throughout the journals, which will be reflected in the reviews.

Herbal medicine combined with lifestyle intervention in PCOS


Polycystic ovary syndrome (PCOS) affects up to 18% of women of reproductive age, representing a significant health burden to women and society. Characterised by menstrual irregularities, hyperandrogenism, polycystic ovaries, and metabolic disorders, first line treatment options include lifestyle modification. Herbal medicine use is common in women with PCOS, with approximately two in five women reporting use. The current study aimed to establish the clinical effectiveness of combining a herbal medicine treatment with a lifestyle intervention in overweight women with PCOS.

This randomised control trial recruited women aged 18–44 years with a confirmed diagnosis of PCOS (Rotterdam criteria) and body mass index (BMI) >24.5 kg/m², from across Victoria, New South Wales, and Queensland. Women were recruited through advertising and referrals from health providers and social media. Exclusion criteria included use of oestrogen or progesterone or antidepressant use due to potential interactions with the herbal medicine. In total, 122 subjects were enrolled, randomised and stratified by BMI, and allocated to lifestyle intervention with or without adjunctive herbal medicine for the three months duration. Baseline characteristics were similar between groups. The lifestyle intervention provided an individualised program by a nutritionist and exercise physiologist that targeted dietary modification and a structured exercise program. Women had regular access and contact to the coaches throughout the study. Women allocated to the herbal medicine group additionally received two naturopathic consultations of 30 minutes duration and the herbal medicine regime. The herbal medicine intervention consisted of two tablets: Tablet 1 contained Cinnamomum verum, Glycyrrhiza glabra, Hypericum perforatum and Paeonia lactiflora. Dosage was three tablets (Tablet 1) per daily for the duration of the trial. Tablet 2 contained Tribulus terrestris (13.5g aerial parts). Tablet 2 was limited to the follicular phase of cycle at a dosage of 3 tablets per day for ten consecutive days commencing on menstrual cycle day 5 for oligomenorrhoeic women and within 1 week for women with amenorrhoea. Study outcomes were assessed at three months with the primary outcome being oligomenorrhoea, with secondary outcomes including serum hormone levels, glucose and insulin sensitivity, anthropometric data, pregnancy rates, health-related quality of life and depression, and anxiety and stress.

At the follow-up, 73% of participants self-reported at least 150 minutes exercise weekly and 86% reported health conscious dietary differences, reflecting uptake of the lifestyle intervention. Uptake was similar between groups. At three months, there was a statistically significant reduction of 32.9% in oligomenorrhoea for women in the herbal medicine + lifestyle intervention compared with controls. The mean cycle length was 43 days less in the herbal medicine group, demonstrating a large clinical effect size for the herbal medicine plus lifestyle intervention. Other statistically significant outcomes at three months included reductions in BMI, fasting insulin, reduced luteinising hormone and blood pressure, with a significant increase in oestradiol levels and significantly higher pregnancy rates. Significant improvement was also noted in quality of life and psychological morbidity in the herbal group compared to lifestyle intervention alone. No serious adverse events were recorded and interventions were generally well tolerated.

Strengths of the study include its pragmatic or contextual design in which study conditions mimicked real-world conditions by including participants with a range of individual characteristics, flexible delivery of dietary and exercise regimes (tailored to individuals), and outcome measures of value to the group being studied, in this case women with PCOS. Additionally, the use of variable herbal dosing over the menstrual cycle reflects common naturopathic and herbal practice. Limitations of the study include the non-controlling of the placebo effect of the herbal tablets through the lack of a placebo control. Whilst the study demonstrated significant effectiveness for the combined interventions (herbal medicine plus lifestyle) compared to lifestyle alone in reducing symptomatology of PCOS including reducing length of the menstrual cycle, improved pregnancy rates and quality of life, studies are now needed to explain how the components of the combined intervention achieved these effects.
**Vitamin B supplementation in elderly patients with cognitive impairment — a meta-analysis**


Increase in serum homocysteine levels (hyperhomocysteinemia) is associated with an increased risk of cognitive impairment in the elderly. A strong association exists between low folate, vitamin B status and hyperhomocysteinemia, with hypomethylation stemming from low vitamin B leading to elevation in homocysteine levels. It is thought this contributes to disease pathophysiology by vascular and direct neurotoxic mechanisms. B vitamins that influence homocysteine metabolism have thus been considered as a prophylactic and therapeutic option to reduce the risk of Alzheimer’s disease and dementia. Research, however, has been conflicting with considerable research finding no effect of B vitamins on slowing cognitive decline. The current meta-analysis evaluated the efficacy of folic acid along with vitamin B12 and/or B6 in lowering homocysteine, thereby attenuating cognitive decline, in elderly patients with Alzheimer’s disease or dementia.

The authors performed a literature search of databases using the terms “cognitive disorders, Alzheimer’s disease, dementia, folic acid, B vitamin, vitamin B6, vitamin B12, homocysteine, aged”. Randomised controlled trials (RCTs) in elderly patient with poor cognitive faculty, secondary to Alzheimer or dementia (with or without vascular dementia), and who received homocysteine-lowering B vitamins of supplements containing vitamin B6, B12, and folate as adjunctive therapy were included in the meta-analysis. Trials in healthy participants, patients with mild cognitive impairment, or in patients with cognitive impairment associated with diseases other than Alzheimer and dementia, such as ischaemic stroke or head injury were not included in the study. Outcome measures were serum levels of homocysteine, folic acid, and vitamin B12, and score from validated scales relating to cognitive functions such as the Mini-Mental State Examination (MMSE) or Alzheimer Disease Assessment Scale-Cognition (ADAS-Cog).

Of 77 studies identified originally through the literature search, a total of four RCTs were included in the analysis. Two RCTs were designed for cognitive impairment secondary to mild-moderate Alzheimer disease, one included patients with probable Alzheimer disease, and one included patients with Alzheimer disease and/or vascular dementia. B vitamin intervention varied between studies from folic acid only, folic acid + vitamin B12 + vitamin B6, folic acid + vitamin B12, and vitamin B12 + multivitamin supplement. Treatment duration varied from 6 to 18 months. Pooled data from the 4 RCTs demonstrated a significant reduction in homocysteine levels in the treatment group compared to placebo control. No significant difference was seen between groups in MMSE scores when data was pooled.

Limitations of the analysis include the varying length of treatments and variability in the dosage regimes of B vitamins and folate. Authors noted that trials of longer duration (3 years or more) had been shown to have positive effect on cognition. Additionally, the diversity of aetiologies of disease and baseline level of cognitive decline further limited the study. The study concluded that whilst adjunctive therapy with folic acid and B vitamins reduced plasma homocysteine levels, it did not provide additional benefit above placebo in preventing further cognitive decline. Further validation of these results with trials involving larger sample sizes and over longer study durations are required.

**Resveratrol supplementation associated with improvement in pain scores in postmenopausal women**


Generalised pain, and or joint pain or stiffness, is a common yet underaddressed complaint in many postmenopausal women. Postmenopausal women reporting more pain tend to be less physically active, which has its own health implications. It has been postulated that vascular dysfunction associated with estrogen decline at menopause may play a role in the initiation and progression of degradative joint disease, such as age-related osteoarthritis.

Phytoestrogens, including isoflavones, exhibit oestrogen-like effects by selectively binding to oestrogen receptors. Previous research investigating the benefit of phytoestrogens in the management of menopause have been mixed. Resveratrol, a polyphenolic stilbene that occurs naturally in grapes, has been characterised as a phyto-oestrogen and has been demonstrated to enhance endothelial function by increasing nitric oxide availability. Unlike isoflavones, its metabolism is not dependent on gut microflora. Authors of the present study evaluated whether supplementation with resveratrol could improve aspects of well-being such as chronic pain in postmenopausal women.

A 14-week randomised, double-blind, placebo-controlled intervention was undertaken in New South Wales, with postmenopausal women aged 45–85 years and not taking hormone therapy, eligible for study recruitment. Exclusion criteria included smokers, medication use of insulin or warfarin, suspected dementia, pre-existing depression, cardiovascular, kidney, liver disease or neurological disorders, and past history of breast or cervical cancer. Participants were randomised to resveratrol intervention (trans-resveratrol 75mg twice daily) or matching placebo for 14 weeks. Participants were instructed to maintain normal habitual dietary and medication regime. Aspects of well-being including pain, menopausal symptoms, sleep quality, depressive symptoms, mood states, and quality of life were assessed at baseline and end of treatment. Cerebrovascular vasodilator responsiveness to hypercapnia was also
assessed as a surrogate marker for cerebrovascular function.

In total, 80 women were enrolled into the study, with 8 withdrawing from the study before the end of intervention (6 from placebo). Average age was 61.5 ± 0.9 years and women were 11.6 ± 1.0 years postmenopausal, with similar baseline characteristics between groups. After 14 weeks supplementation, authors reported a significant improvement in CVR to hypercapnia in the resveratrol group compared to placebo. Furthermore, resveratrol supplementation was associated with a significant reduction in overall pain from baseline levels, which was not observed in the placebo group. No significant improvements were observed in other parameters, except for total wellbeing; however, this significance was lost in the intention to treat analysis. No adverse events were reported.

The study has several limitations. Firstly, participants did not specify the source and location of pain, nor the chronicity of the pain. Additionally, pain measurements were subjective to participants and the use of biomarkers such as inflammatory markers may provide more objective measures. Further research is required to better understand a potential role of resveratrol in the management of pain in postmenopausal women.

**Soy protein with isoflavones reduce markers of bone turnover**


Postmenopausal oestrogen reduction is associated with increasing bone loss and osteoporosis. Oestrogen increases bone mineral density (BMD) and has a protective action on bones in females. Previous epidemiological research has generally reported a positive association between soy consumption and BMD; however, research assessing the effect of soy isoflavones on bone health have provided conflicting results. The current study aimed to evaluate the effect of soy protein with or without isoflavones on markers of bone turnover.

Women within 2 years of the onset of menopause were recruited into the study. Menopause was defined as amenorrhoea for 1 year and FSH >20mIU/L. Subjects were either on stable medications for three months prior to study commencement or on no medications at all. Exclusion criteria included medications that could interfere with bone metabolism including steroids, bisphosphonates, thyroxine or hormone replacement therapy. In total, 200 women were randomised to receive SPI (15g soy protein with 66mg isoflavones) or SP (15g soy protein alone) daily for 6 months. The soy interventions were provided in the form of soy snack bars that subjects were required to eat twice daily between meals. The primary outcome was change in bone turnover markers (BTMs), including resorption marker, type I collagen crosslinked beta C-telopeptide (βCTX), and formation marker, type I procollagen-N-propeptide (P1NP). BTMs are biomarkers for fracture risk that have been used for the diagnosis and evaluation of therapy effects on osteoporosis. Secondary outcomes were change in cardiovascular risk markers including insulin resistance, lipids and blood pressure.

At baseline, anthropometric, metabolic, plasma isoflavone levels, and BTMs were comparable between groups. After six months supplementation, the mean βCTX was significantly lower in SPI group compared to SP group. A significant reduction in P1NP was also seen with SPI supplementation compared to SP supplementation. With respect to secondary outcomes, a significant reduction was observed in the SPI group from baseline for fasting glucose, fasting insulin, insulin resistance and systolic blood pressure whilst no significant changes were observed with SP. No significant changes were noted for fasting lipids or diastolic blood pressure for either group. SPI supplementation was also associated with a significant increase in thyroid stimulating hormone (TSH) and a reduction in free thyroxine.

The authors reported that this was the first study to use a soy preparation that was isoflavone-free and allows for better understanding of the therapeutic effect of soy components. With no treatment effects from baseline in the SP group, authors suggest soy with isoflavones may have a beneficial effect on bone health, with a significant decrease in bone turnover markers or resorption and formation after 6 months. The effect of soy protein with isoflavones on thyroid health should be considered when evaluating the benefits of soy.

**Consensus statement regarding breath testing for gastrointestinal disorders**


Breath tests (BT) are an important and commonly used intervention for investigating a number of common gastrointestinal conditions including small intestinal bacterial overgrowth (SIBO), irritable bowel syndrome (IBS)-like symptoms and carbohydrate malabsorption syndromes. BT relies on measurement of gases produced in the intestine which diffuse through the systemic circulation and are expired through the lungs, allowing for detection in the exhaled breath. With a variety of substrates at varying doses presently used for BT in clinical practice, there is currently a lack of standardisation regarding indications for testing, test methodology and interpretation of results. Accordingly, a consensus meeting of experts was convened to develop guidelines for clinicians and research for the use of BT in gastrointestinal disorders.

Five key domains were addressed in the consensus, namely: Indications, preparation, performance, interpretation of results, and knowledge gaps. Using an evidence-based approach, 28 statements were finalised and were voted on anonymously by a working group of specialists. Consensus was reached on 26 of the statements encompassing the five domains.
The first guidelines around the use of BT in clinical practice, there are some key statements regarding preparation of patients with regard to medication use such as antibiotics, laxatives or promotility drugs and proton pump inhibitors, as well as guidance on smoking, physical activity and consumption of fermentable foods. Importantly, the guidelines recommend BT indications to include for diagnosis of SIBO and carbohydrate maldigestion syndromes and for the assessment of conditions associated with bloating. It was noted that BT is not useful for the assessment of oro-cecal transit time. Consensus doses were established for lactulose, glucose, fructose and lactose allowing for guidelines on BT methodology. Furthermore, consensus statements were provided for test interpretations. A rise in hydrogen of ≥20p.p.m. by 90 minutes during glucose or lactulose BT for SIBO is to be considered positive. Methane levels ≥10p.p.m are considered methane-positive. For assessment of carbohydrate maldigestion, a rise in hydrogen ≥20p.p.m above baseline is considered positive. Further to these statements, a number of gaps in knowledge were identified and specified, providing a direction for future research.

As the popularity of breath testing increases in a clinical setting, it is important to ensure consistency and standardisation of indications, methodology, and interpretation of results. BT is a useful, inexpensive, simple and safe diagnostic tool and the consensus provides a guideline in which it can be best utilised. The first guidelines around the use of BT in gastrointestinal conditions establish standards for indications, use and interpretation, and importantly, recognise their role in the diagnosis of SIBO and carbohydrate maldigestion syndromes.

**Dietary inflammation and bone health in postmenopausal women**


Chronic inflammation is associated with increased risk of several age-related diseases, including osteoporosis and fragility fractures. Whilst dietary components have been shown to modify inflammation via both pro-inflammatory and anti-inflammatory mechanisms, it is suggested that a single food or nutrient may not be sufficient to reduce fracture risk in postmenopausal women. The Dietary Inflammatory Index (DII) was developed to assess the overall quality of a diet on a continuum from maximally anti-inflammatory to maximally pro-inflammatory based on dietary foods reported to positively or negatively affect levels of markers of inflammation.

The Women’s Health Initiative (WHI) is the largest study of postmenopausal women ever undertaken in the United States, involving over 160,000 women focusing on the prevention and control of common disease impacting older women. The current study aimed to evaluate the association of the DII with risk of hip, lower-arm, and total fracture using longitudinal data from the WHI. Secondary outcomes included evaluation of changes in bone mineral density (BMD) and DII scores. DII scores were calculated from food frequency questionnaires completed by WHI participants at baseline. Fracture data was reported at least annually in the WHI, with hip fractures confirmed by medical records. Women who had a history of hip fracture at baseline were excluded from the analysis. BMD data for the analysis were from a subset of women who had serial BMD measurements at baseline, year 3, and year 6.

In total, 47,974 incident fracture cases were identified from the WHI data. Women with the lower DII scores (i.e. the least inflammatory diet) lost significantly less BMD at the hip of 6 years compared to women with the highest DII scores (i.e. the most inflammatory diets). In women who were younger than 63 years and white, a higher DII score was associated with an increased risk of fracture. Conversely though, total fracture and lower-arm fracture risk was modestly lower in women with the higher DII scores.

Whilst authors hypothesised a more inflammatory dietary pattern would increase risk of fracture, the results only supported this in younger white women. Several possible reasons were considered that may contribute to this including that the inflammatory dietary pattern for bone health are more greatly influenced by fracture risk associated with aging.

This is an important study being the first to investigate the DII and fracture outcomes and changes in BMD. With an ageing population, better understanding of modifiable risk factors for age-related conditions is highly relevant. Consumption of a more inflammatory diet was associated with increased risk of hip fracture in younger white women. A less inflammatory dietary pattern was associated with less BMD loss in postmenopausal women. Further research to confirm these results and better understand the influence of dietary inflammation on bone health are warranted.

**Fennel in postmenopausal women on symptoms of anxiety and depression**


Anxiety, depression and mood disorders are highly prevalent conditions with significant personal, social and economic costs. Recent studies have identified an increased risk of depression during the menopausal transition. Hormone therapy has been demonstrated to be an effective treatment for managing symptoms of menopause; however, there are risks and limitations to these treatments. Herbal medicines remain a popular
intervention for women during menopause, with increasing interest in phytoestrogens. *Foeniculum vulgare* (fennel) has traditionally been used for digestive and gastrointestinal, although recognised as a phyto-oestrogen. Animal studies have demonstrated anti-depressive and anxiolytic effects of fennel; however, little is understood its effect on anxiety and depression in humans. Authors of the present study aimed to investigate the effect of *F. vulgare* on anxiety and depression symptoms in postmenopausal women.

The study was a randomised, double-blind, placebo-controlled trial with participants recruited from a medical hospital in Iran. Women were eligible for inclusion if they were postmenopausal, defined as >40 years with no vaginal bleeding, and had had a normal mammogram in the previous year. Exclusion criteria included a history of endometrial or breast cancer, allergy to fennel, and regular ingestion of phyto-oestrogen or soy products. Participants were allocated to fennel or placebo group and were required to take fennel capsules (100mg 30% fennel + sunflower oil) or placebo (mineral oil) three times daily. Levels of anxiety and depression were assessed in participants at baseline and at the three month follow-up using the Zung Self-Rating Depression Scale (SDS) and the Hospital and Anxiety Depression Scale (HADS).

In total, 60 women were randomised for treatment with end data analysed for 49 subjects (fennel n=25; placebo n=24). Differences in baseline characteristics existed. The mean age of patients in the fennel and placebo groups was 57.04 ± 4.67 and 54.79 ± 4.22 years, respectively. Additionally, mean menopausal age was 46.94 ± 6.35 and 48.54 ± 4.29 years for the fennel and placebo groups, respectively. At baseline, SDS scores and HADS scores were comparable between groups. After three months of intervention, there was no significant decrease in SDS or HADS scores in either group. When stratifying the data to identify patients with depression or anxiety at baseline based on the SDS or HADS scores, significant reductions in SDS score and HADS-anxiety domain were observed in the fennel group when compared to placebo. It should be noted that these findings are based on small numbers and the study did not appear to be designed or sufficiently powered to detect statistically significant differences at these numbers.

This study is interesting as it reports to be the first human trial reporting the effects of fennel on anxiety and depression. Understanding the potential therapeutic effects of herbal interventions is important as recognising the populations in which they may be suited. Whilst authors commented that fennel may be effective in alleviating depression and anxiety disorder in menopausal women, it was recognised that further studies with larger sample sizes are required to better understand any therapeutic effect of fennel in clinical settings.

**Vitamin and mineral supplemenation in schizophrenia — a meta-analysis**


Affecting around 1% of the population worldwide, schizophrenia is amongst the most disabling of health conditions. Current mainstays of treatment include antipsychotic medications which whilst can be beneficial in the short-term, are associated with poor outcomes over the longer term and high relapse rates. Previous research has reported some evidence that certain vitamins and minerals may be effective for improving symptomatic outcomes of schizophrenia when used as an adjunctive with antipsychotics. Proposed mechanisms include restoring nutritional deficits, reducing oxidative stress, or modulating neurological pathways. Authors of the current paper conducted a systematic review and meta-analysis to establish the efficacy of vitamin and mineral supplements for people with schizophrenia.

An electronic database search was conducted for studies published until July 2016. Randomised controlled trials (RCTs) reporting psychiatric outcomes of vitamin and/or mineral supplements for people with schizophrenia, with eligible samples required to have >90% of participants having a diagnosis of a non-affective psychotic disorder. Studies with less than 90% of the sample were only included if the data for the non-affective psychosis group was reported separately. Random-effect meta-analyses were used to calculate the standardised mean difference between nutrient and placebo treatments.

In total, the search identified 18 eligible RCTs providing outcome data for 832 patients. In the eligible samples, 99.5% had a diagnosis of schizophrenia/schizoaffective disorder, and 0.5% had bipolar disorder. The mean age of participants was 42.8 years, 70% were male, with a mean duration of illness was 17.2 years. Nutrient treatments ranged from 5 days to 1 year, lasting an average of 10.3 weeks. All nutrient treatments were administered as an adjunctive to pharmacological treatment.

Outcomes from 7 pooled vitamin B RCTs (n = 297) (including pharmaceuticals plus B6, B9 and B12) reduced psychiatric symptoms significantly more than pharmaceutical alone control treatments. Significant heterogeneity was identified in the trials which limits the strength of these findings. Three studies (n = 66) examined the effects of inositol supplementation on psychiatric symptoms in schizophrenia with the meta-analysis finding no overall effect on total symptom scores. Antioxidant vitamins including vitamin E alone, vitamin C alone, or vitamins E and C in combination were considered in six studies (n = 340) with no effect observed on symptom scores. Two studies (n=129) investigated the effect of mineral supplementation (zinc and chromium) on psychiatric symptoms; however, no overall effect was observed.
Author concluded that high-dose B vitamins may be useful for reducing residual symptoms in people with schizophrenia, whilst noting the limitations of the study and its findings. Limitations include small sample sizes of the studies included and the previously mentioned heterogeneity of studies, limiting interpretation of the findings. With the potential of nutritional supplements or dietary interventions to be an effective adjunct in the management of illness, further research is required to better understand optimal timing of treatment, mechanisms by which nutrients influence symptoms of schizophrenia, and the potential role of other nutrients including amino acids.

**Low FODMAPs diet influence on quality of life in IBS**


Irritable bowel syndrome (IBS) is a common gastrointestinal illness that can have a significant impact on the quality of life (QOL) of those affected. Furthermore, people with IBS are reported to consume greater health care resources, undergo more surgical procedures and have reduced work productivity compared to people without IBS. Accordingly, there is an interest in treatments that improve patient outcomes in IBS.

Fermentable oligo-, di-, and mono-saccharides and polyols (FODMAPs) are poorly absorbed, osmotically active short-chain carbohydrates that are rapidly digested by gut bacteria producing short-chain fatty acids and gases that can trigger symptoms in IBS patients. Previous studies have demonstrated improvement in the main symptoms of IBS after dietary restriction of FODMAPs; however, there is limited data addressing the impact of a low-FODMAP diet on other IBS parameters, including QOL. The current study investigated with the effects of a low FODMAP diet on health-related QOL, anxiety and depression, work productivity and sleep quality in patients with IBS, compared to traditional dietary recommendations.

The article is a post-hoc analysis of a prospective, single-centre study involving 92 patients with IBS-diarrhoea predominant (IBS-D), as assessed by a gastroenterologist to meet Rome III criteria. Dietary instruction was provided by specifically trained research dietitians with randomised patients receiving dietary counselling for low FODMAPs or standard dietary recommendations for IBS based on modified guidance from the National Institute for Health and Care Excellence (mNICE). The dietary intervention was scheduled for four weeks with IBS-associated QOL, psychosocial distress, work productivity, and sleep quality assessed before and after diet periods using validated scales. Investigators analysing the data were blinded to randomisation.

Of the patients who were randomised to a dietary intervention, 84 participants completed the study period, with QOL data available in 88 patients. There were more drop outs in the low-FODMAPS group (5 vs 2). The mean IBS-QOL score significantly improved at 4 weeks in both groups; however, the magnitude of improvement was significantly greater in the low-FODMAPS arm. Additionally, a greater proportion of participants in the low-FODMAPS arm had a clinically meaningful improvement as based on the IBS-QOL scores. Anxiety scores after 4 weeks significantly improved in the low-FODMAPS arm whereas there was no significant difference in scores for the mNICE group. There was greater improvement of activity impairment scores from baseline in the low-FODMAPs groups compared to mNICE; however, no significant improvements in absenteeism, presenteeism, or work productivity were observed. Sleep quality improved in both groups from baseline with no significant differences between groups observed.

Whilst the study demonstrates benefits in QOL measures in a reasonably limited time frame, the study was unable to demonstrate improvements in work productivity and no difference in sleep quality compared to mNICE recommendations. Limitations include that the study was not powered for the endpoints of this post-hoc analysis and the lack of control of the food intake with meals not prepared or provided to participants. Studies of longer duration that are sufficiently powered will provide greater understanding into the immediate and sustained effects of the low-FODMAPs dietary changes in patients with IBS over a greater period of time.

**References**


Around the colleges, institutes and universities

Name: David Casteleijn
Position: Partner, HerbsontheHill
Naturopath, HerbsontheHill
Director, NHAA

College, institute and/or university:
ECNH, Contract Academic
UTS, PhD Candidate

Areas of interest:
Public health and health reform
Naturopathic professional issues
Naturopathic professional development
Anxiety and depression
Digestive dysfunction
Immune irregularities
Infectious diseases

Words of wisdom:
Always look beyond the hype and consider — is this really naturopathic? Just because it involves a diet or nutrient does not necessarily mean it is naturopathic.

As a naturopath, you can often do your best work by supporting your client to remain on their medical treatments. HIV is a prime example, where current medical treatment has advanced to a point where the best work a naturopath can do is help their client stay on medical treatment. Many years as a registered nurse in an infectious disease unit taught me how valuable conventional/pharmaceutical medicine is in our modern context.

The client is the centre of your work, of course you need to keep good notes, but don’t let the paperwork lead the way, follow your client on their journey.

PhD research project:
A naturalistic observation study of Western herbal medicine in the treatment of anxiety and depression. Self-selecting clients visiting a naturopath for a regular consultation seeking treatment for anxiety or depression complete patient outcome measures over three consultations, so we can measure the effect. Currently there are about 15 practitioners recruiting participants mainly in the eastern states. The study design allows for very few exclusion criteria so there is no need to exclude participants if they are currently prescribed pharmaceutical medication allowing us to also demonstrate (hopefully) how well herbal medicine can sit beside and support pharmaceutical medicine. If you are interested in being a practitioner in the study head to http://herbsonthehill.com.au/anxiety-and-depression-study to know more.

Name: Ian Breakspear
Position:
Sessional Lecturer, Clinician
Naturopathy/Western Herbal Medicine Department

College, institute and/or university:
Australasian College of Natural Therapies
Endeavour College of Natural Health

Areas of interest:
Teaching: Herbal therapeutics, pharmacognosy and phytopharmacology.
Clinical: Helping patients with cardiovascular and chronic inflammatory conditions.

Words of wisdom:

Education in naturopathy and herbal medicine has had its ups and downs over the last 30 years. Courses have gone from a four-year full-time diploma when I started in 1989, to a low point of a two-year advanced diploma in 2010, now to four-year bachelor degrees at private institutions. Clinical undergraduate courses in herbal and naturopathic medicine in Australian universities have come and (unfortunately) gone over that time. I’ve been both witness to, and participated in, this change for over 20 years as both a lecturer and as an academic manager.

In my experience, however, educational outcomes are only ever significantly influenced by two groups of factors. The first is the enthusiasm, dedication and time investment of the student. The second is the enthusiasm, experience, and teaching ability of the lecturers.

My words of wisdom for students:

• Invest the time. True learning can’t be rushed. If you expect to hold down a part-time job, have a social and family life, and study full-time, then you’ll be making significant compromises along the way.
• Seek out peer support. A network of fellow students can really help you through those difficult patches — both academically and personally.
• Ask about the experience of your lecturers. The best lecturers use their experience to bring the curriculum alive.
• Be flexible. There are many career opportunities available now, but you need to identify your strengths, find ways of utilising them, and remain open to change.

My words of wisdom for educational institutions:

• Invest in the foundations. The best advertising comes from a satisfied student. And students are most satisfied when the foundations of their learning are solid. Fancy support programs, bright displays, and noisy events are never as impactful as a well thought out and properly scaffolded curriculum, the most experienced lecturing staff in the classroom, small to
medium class sizes, and consistency in the way the curriculum is delivered, assessed, and updated.

- Respect your teaching staff. A lot of time and effort goes into delivering an effective class. Overloading your teaching staff with paperwork and unnecessary policies just reduces the time and energy they have for students. Holistically review expectations to ensure that the skills of your teaching staff are used in the most effective way. Some administration is part of the job, but a teacher is a teacher, not an administrator.

- Involve sessional teaching staff in periodic reviews of curriculum. These people are both at the cutting edge as well as the coalface. They know what works, and what doesn’t. Inform them of bureaucratic/regulatory obstacles to change, but empower them to collaborate on taking your curriculum from good to awesome.

- Focus your communications. In today’s world of large multinational, multi-college, educational institutions, neither your students nor your lecturers have the time or interest in being bombarded by emails about what is happening in some design/computing/engineering/etc faculty in an institution on another continent. Tailor your communications to be relevant.

- Live the profession. Institutions need to identify with, uphold, and promote the values of the herbal and naturopathic profession into which they teach.

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* Cordyceps is used in traditional Chinese medicine (TCM) to tonify the lungs, while reishi is used in traditional Western medicine to help increase energy.