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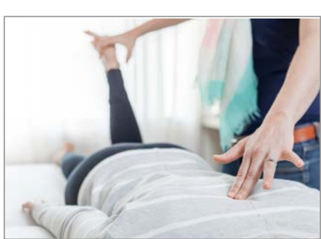

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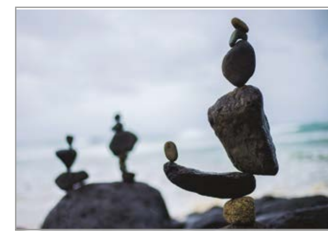

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ATMS strongly supports sustainable practices to preserve the health of our planet. Consequently, we encourage members to take up the online option for this journal.

President's *Report*

Peter Berryman | ATMS President

Let me tell you about the "wellbeing pandemic" that is currently happening. You may even wish to subjectively assess your "infection status" by measuring your own physical, mental, and spiritual wellbeing. Here's how. It's best done with support from the World Health Organisation's WHO-5 Index, which was designed in 1998 to measure people's subjective wellbeing according to five simple criteria: your cheerfulness, calmness, vigour, restfulness, and fulfilment. This Index is among the most widely used questionnaires assessing subjective psychological well-being.

Translated into more than 30 languages, the global influence of this WHO-5 Index should not be underestimated in this current "wellness pandemic". Governments and international corporations have embraced it and, based on it, have implemented their own in-house wellbeing policies for public and private health. In my opinion, the result is a simplistic and narrow interpretation of wellness implied by this Index, and an implicit marginalisation of any alternative perspectives regarding wellness, such as an indigenous one, and a rainbow spectrum of other approaches to physical and mental health.

Despite our intrinsic personal protective equipment (PPE), such as our own strategies for dealing with the narrowness of this document (which includes our wry smile), natural medicine practitioners and our clients are likely to be critically "infected" in this "wellbeing pandemic", as those "infected" often report the experience of being in tune with themselves and their environment - "being in the flow". This "flow" can be characterised as a deep sense of connection, a diminished self-consciousness, changes in attentional focus, and most notably, a change in the way that time is perceived. Colloquially, this is also known as "being in the zone". Do you sometimes sense this about yourself? Please assess yourself now against the WHO-5 Index criteria above, and be at ease knowing that you are highly likely to be "infected". Well, I certainly feel that I am. And is it in fact "infectious"? You may recognise that such a sense of "flow" has also been found rampant in a range of other contexts with other dextrous humans like us, such as in people who have also found themselves "infected" while enjoying more traditional athletic and adventure settings, like watching women's international soccer games, in comparison to communing in our private clinic spaces.

Like our clients, who may also welcome becoming "infected" when they venture into our workplaces (which more commonly now also includes the shared cyberspace of online consulting from our private home), we are all on our own healing journey, discovering "flow" with its unique meaning, purpose, connection, competence, pleasure, and wellbeing, wherever and however that may be for both them and you. Yes, we are potentially eagerly dispensing to young and old clients large doses of "flow" from our growing and eager national workforce of natural medicine practitioners. This could even result in relief of all manner of angst and pain by enjoying the numerous and humble benefits of "flow" as found in every good prescription, or perhaps a mature red wine for the over 18 age group, otherwise in ample dark chocolate for all.

Please consider booking in advance to attend online or in person, the ATMS Environmental Medicine Symposium that is a full day event to be held in Sydney on Sunday 22 October 2023 to reap the abundant benefits of the copious amounts of numinous "flow" that will abound on that day. We will have five of the best Australian presenters who are experts in environmental medicine discussing chemicals, toxins, mould, and mould related illnesses, as they present to an audience of practitioners their evidence-based solutions to enhance health, support detoxification pathways, and minimise exposure to such problems. See you there.

Meanwhile, keep well ...

Peter Berryman
President

CEO's *Report*

Charles Wurf | ATMS CEO

ATMS lifelong learning

ATMS has always maintained as a core pillar of membership a member commitment to lifelong learning. This foundation commitment is contained in the Objects of the ATMS Constitution.

Objects

3 (b) to encourage a high standard of knowledge, ethics and proficiency in the profession of Natural Medicine through life-long learning and accreditation initiatives;

The ATMS Constitution further embeds the commitment to lifelong learning through the practical policy of Continuing Professional Education (CPE).

6.16 Conditions of Accredited membership

Accredited members must:

(a) maintain at all times current First Aid certification

(b) maintain at all times the required and current professional indemnity insurance as determined by the Board from time to time; and

(c) complete continuing professional education as set out in the applicable By-Law.

The ATMS Board has commenced a review process of CPE policies. Through 2023-2034 we intend to reinforce the purpose of CPE compliance as the ongoing validation of our commitment to lifelong learning.

ATMS supports this commitment as a core component of professional standing for the practice of natural medicine.

The current ATMS member portal allows each member to self-load each CPE activity. Each member record can show an ongoing tally of CPE activities and total points (the one proviso here is that any CPE activity conducted by ATMS will be automatically loaded for you, so there is no need to enter ATMS CPE activities).

Over the coming years ATMS will take a proactive approach with all members to encourage you to plan and undertake your CPE activities for the year, and then to self-enter those CPE activities into the current member portal. The member portal is the place to securely store the details of your ongoing validation of lifelong learning. An enhancement of this feature of the current member portal is a key part of the current redevelopment of the ATMS website.

Underpinning this reinforcement of validation of lifelong learning for all members is a renewed approach to the annual ATMS CPE audit. We have reviewed the positive learnings from our experience of CPE during the COVID years, and we will now work over an extended time frame with the CPE sample group, starting in 2023 -2024.

The CPE sample group for 2023-2024 will be selected and notified in August and will be encouraged to plan and complete CPE during the year 1 July 2023 to 30 June 2024, and to validate that CPE on an ongoing basis throughout the year. ATMS will then use the validation details self-loaded in the member portal to assess compliance with the CPE policy and formalise the CPE audit for the sample group.

Health fund update

Members are reminded that Health Funds also conduct random audits. Health Funds can audit your clinical records, copies of invoices related to treatments and/or your CPE. The Health Funds specify times and dates for reply and ATMS encourages any member facing a Health Fund audit to acknowledge receiving their email and to respond to the audit in a timely manner. Failing to respond in time to a Health Fund audit will close your Health Fund recognition and will make it difficult for both yourself and ATMS to reinstate Health Fund recognition.

Keeping clinical records and CPE up-to- date helps you respond to audits without delay, resulting in a positive outcome for you.

The key protection for Health Fund provider numbers is to always maintain currency of the four key pillars for Health Fund recognition: professional indemnity insurance, first aid, annual CPE and financial ATMS membership.

As so much of the Health Fund system is now digital, all expiry dates are maintained and tracked by computer. Best practice for ensuring currency is early renewal before expiry. ATMS now recommends renewing Professional Indemnity insurance and First Aid 14 days before expiry and advising ATMS immediately.

Contact us for support

For any aspect of ATMS membership and Health Fund administration, the ATMS team is available to contact on 1800 456 855 or **info@atms.com.au.** Documents supporting membership and CPE may also be submitted online via the membership portal on **www.atms.com.au.**

The ATMS member portal has been upgraded to allow easy upload of the key membership documentation: annual Professional Indemnity renewals, renewed first aid certificates and clear and concise member entry for all CPE activities.
The CPE portal allows line-by-line user entry of all member CPE activities with a visual tally of total CPE points. For those members selected in the ATMS CPE audit, the online portal is also available to provide evidence of each CPE activity to substantiate audit compliance.

We look forward to working with and supporting members throughout the 2023-2024 membership year.

Charles Wurf
CEO

ATMS SPECIAL EVENT

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Chronic fatigue syndrome: *The potential of nutritional medicine*

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Abstract

Chronic fatigue syndrome (CFS) is a debilitating fatigue condition that is both physical and mental in nature. CFS affects various body systems, with numerous symptoms, including fatigue, exhaustion, muscle pain, joint pain, anxiety, depression, stress, cognitive dysfunction, and digestive symptoms, among others. Optimum nutrition is the foundation for optimum health. Vitamins, minerals, amino acids, probiotics, lactoferrin, and water have numerous benefits in improving health. This article discusses chronic fatigue syndrome and introduces the potential of Vitamins A, B1, B2, B3, B5, B6, folate, B12, C, D, E, K, coenzyme Q10, lipoic acid, omega-3, minerals (calcium, chromium, copper, iodine, iron, magnesium, manganese, molybdenum, selenium, silica, zinc), N-Acetylcysteine, carnitine, glutamine, probiotics, lactoferrin, and water in the management of chronic fatigue syndrome.

Introduction

Fatigue is one of the most common complaints in daily life.[1] Chronic fatigue syndrome (CFS) is a debilitating fatigue condition[2,3] that is both physical and mental in nature.[4] It is characterised by fatigue[2-7] and affects various body systems, such as the central nervous system,[6] nervous system,[5] immune system,[5,6] digestive system,[5,6] cardiovascular system,[6] musculoskeletal system,[4,6,7] endocrine system,[5] cognition,[3,4,6] and also affects cell energy metabolism.[6] Optimum nutrition is the foundation for optimum health.[8,9] Vitamins, minerals, amino acids, probiotics, lactoferrin, and water have numerous benefits in improving health via various mechanisms of action, such as energy metabolism,[10,11] modulation of inflammation,[12-14] antioxidant and free radical scavenging effects,[15] formation of haemoglobin,[15] immune cell function and immune responses,[16] metabolism of carbohydrates[17,18] and glucose,[19,20] metabolic regulation,[21-24] bone health,[25] muscle and nerve function,[26] neurotransmission,[26] heart rhythm,[26] detoxification,[27] digestive health,[28-30] and the normal functioning of the nervous, endocrine, cardiovascular, and immune systems,[31] among other functions.

There are many pieces to the puzzle of chronic fatigue syndrome. This article aims to shed light on the symptoms and various causes of chronic fatigue syndrome. It introduces the potential of nutritional medicine, including Vitamins A, B1, B2, B3, B5, B6, folate, B12, C, D, E and K, coenzyme Q10, lipoic acid, omega-3, minerals (calcium, chromium, copper, iodine, iron, magnesium, manganese, molybdenum, selenium, silica, zinc), N-acetylcysteine, carnitine,

glutamine, probiotics, lactoferrin, and water in the management of chronic fatigue syndrome.

Chronic fatigue syndrome

Chronic fatigue syndrome can affect any age group,[3] with the average age of onset mainly affecting adults from 20 to 40 years of age.[4] The symptoms of chronic fatigue syndrome also affect children, adolescents, and older adults.[4] It has a 2-3 times higher prevalence in women than men.[3,4] It is fundamentally characterised by intense fatigue of unknown origin or cause.[4] Chronic fatigue syndrome typically occurs acutely and sometimes suddenly, usually in a previously healthy person.[4] People report having been healthy before the onset of symptoms, being fully functional and with an active social life.[5] Initially, the symptom picture starts with fever, sore throat, cough, muscular pain, headache, and fatigue.[4] There is difficulty in concentrating[4,6] and either insomnia or hypersomnia.[4] The course of chronic fatigue fluctuates, with symptom severity changing drastically only in a few days.[5] The typical duration is of at least 6 months.[7] Chronic fatigue syndrome worsens with physical and emotional stress[4] and does not improve with rest.[1,4,6,7,32]

Chronic fatigue syndrome is a multi-systemic condition[5] that affects the central nervous system,[6] nervous system,[5] immune system,[5,6,33] digestive system,[5,6] cardiovascular system,[6] musculoskeletal system,[4,6,7] cognition,[3,4,6] endocrine system,[5] and affects cell energy metabolism.[6] There is ion transport dysfunction, impaired mitochondrial metabolism[6] and function,[5] inflammation,[5,6,33] increased reactive oxygen species,[6] oxidative stress,[5] decreased antioxidant capacity,[34] deregulation of glycolysis and urea cycle activity,[35] and altered adenosine triphosphate (ATP) homeostasis.[6]

A common feature of the fatigue is a "sense of energy depletion".[36] Mental and physical fatigue are experienced when a sufficient amount of energy does not meet the brain's and muscles' ongoing demands, respectively.[36] The fatigue can be seen as permanent and limits a person's functional capacity, producing various degrees of disability,[4] which limits activities, such as those with family,[1,4] work,[1,3,4] education,[3] and social activities.[1,3,4] There is a prolonged exacerbation of post-activity fatigue that is triggered by tasks previously achieved without difficulty.[37] If a person with chronic fatigue syndrome overexerts themselves, they have what is termed "payback" resulting in a worsening of symptoms or a relapse lasting for days,

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weeks, or even months.[35] In some cases, people may need help with their basic day-to-day activities.[4] There is an overlap between chronic fatigue syndrome and burnout.[38-40]

Figure 1. Symptoms associated with chronic fatigue syndrome

Fatigue[2-7,33,35]
Absentmindedness[3]
Alcohol intolerance[3]
Altered gut microbiome[5]
Anxiety[3,4]
"Brain fog"[33]
Burnout[38-40]
Cardiovascular problems[6]
Chronic sinusitis[3]
Cognitive dysfunction[3-6,33,37]
Constipation[5]
Depression[3,4]
Diarrhoea[5]
Difficulty concentrating[6,7]
Difficulty with standing still[3]
Exhaustion[3]
Fibromyalgia[3]
Gastrointestinal dysfunction[6]
Hay fever[3]
Headaches[3,4,6,7]
Hypothalamic-pituitary-adrenal (HPA) axis dysregulation[34]
Hypothyroidism[3]
Inability to multi-task[3]
Intestinal discomfort[5]
Intestinal dysbiosis[5,33]
Intolerance to light[5]
Intolerance to noise[3,5]
Intolerance to physical exertion[4]
Intolerance to simple conversations[5]
Intolerance to specific odours or chemicals[5]
Intolerance to stimulation[5]
Intolerance to temperature extremes[3,5]
Irritable bowel syndrome[3,5]
Issues with perception[5]
Joint pain[4,6,7]
Low cortisol[34]
Memory issues[5,6]
Migraines[3]
Multiple chemical sensitivities[3]
Muscle pain[4,6,7,33]
Musculo-skeletal pain[7]
Pain[3]
Postural orthos-tatic tachycardia syndrome (POTS)[3]
Seasonal affective disorder[3]
Sleep disorders[3,4]
Sleep disturbance[7]
Sore throat[6]
Stress[3,6]
Temporoman-dibular joint disorder[3]
Tender lymph nodes (lymphadenopathy)[6,7]
Un-refreshing sleep[3,6,32,33,41]

Chronic fatigue syndrome is associated with a broad spectrum of symptoms (Figure 1). There is un-refreshing sleep.[3,6,32,33,41] People with chronic fatigue syndrome spend longer time in bed.[41] They have been found to have longer sleep onset latency, longer awake time after sleep onset, reduced sleep efficiency, decreased stage 2 sleep, more stage 3, and longer rapid eye movement sleep latency.[41]

The cause, or causes, of chronic fatigue syndrome are unclear. There is no diagnostic test, validated biomarker, or clear pathophysiology of chronic fatigue syndrome at this stage.[37] A typical onset pattern of chronic fatigue syndrome is a distinct change in health, signalled by an infectious event then followed by a gradual progression to becoming consistently unwell.[3] Various infections have been associated with chronic fatigue syndrome, such as Epstein Barr virus,[3,4,6,7] Cytomegalovirus,[3,4,6] Candida albicans,[4] Ross River virus,[6] Enterovirus,[4,6] Borrelia burgdorferi,[4] Human Herpesvirus,[4,6] Retrovirus,[4] Borna virus,[4] Coxsackie B virus,[4] hepatitis C virus,[4] mycoplasma,[6] and Lyme disease,[6] plus other unknown viruses. The disturbances in the immune system associated with chronic fatigue syndrome may be the result of viral infection.[6] Additionally, it may lead to the reactivation of latent viruses.[6] Once reactivated, viruses may contribute to the morbidity of chronic fatigue syndrome via inflammation and immune dysregulation.[6] It is noted that people with chronic fatigue syndrome have a higher susceptibility to infections, especially of the upper respiratory tract.[33] Chronic fatigue syndrome has been identified among recovered Coronavirus 2019 (COVID-19) patients as the most common symptom of long COVID.[42] A systematic review and meta-analysis on chronic fatigue syndrome among long COVID patients found that post-COVID-19 chronic fatigue affects people's lives, individually, socially, and spiritually.[42]

The microbiome of the gastrointestinal system plays a role in the progression of chronic fatigue syndrome.[5] The intestinal barrier integrity is essential for the absorption of nutrients and health.[43] Dysfunction of the mucosal barrier of the intestinal tract is associated with increased gut permeability and the development of multiple gastrointestinal diseases.[43] Fatigue may result from dysfunction or imbalance in the oxygen supply to muscles and the brain.[36] Muscle and brain tissue are highly dependent on oxygen.[36] During anaemia, oxygen delivery is impaired (due to reduced haemoglobin), leading to reduced cognitive and physical performance, and perceived fatigue and tiredness.[36] People with chronic fatigue syndrome have been found to have lower total antioxidant capacity.[34] Oxidative stress and decreased antioxidant capacity are known to disrupt the hypothalamic-pituitary-adrenal (HPA) axis.[34] Among the broad range of symptoms, many patients report disturbances in emotional health, the most frequent of which is anxiety.[44] Stress and trauma play a role in the progression of chronic fatigue syndrome.[6] A history of childhood trauma increases the later risk of developing chronic fatigue syndrome.[7] Family and twin studies have shown a genetic component to chronic fatigue syndrome.[37]

Nutritional medicine management of chronic fatigue syndrome

Optimum nutrition is the foundation for optimum health.[8,9] There are many pieces to the puzzle of chronic fatigue syndrome. Therefore, the management of a person with chronic fatigue syndrome is holistic in nature. The focus is on treating the whole person (mind, body, spirit).[8] Identifying and treating the underlying causes, background activity, and triggers[8] are very important in the management of chronic fatigue syndrome. Here we introduce the potential of vitamins, minerals, amino acids, lactoferrin, probiotics, and water, via various mechanisms of action, in managing chronic fatigue syndrome.

Vitamin A

Vitamin A plays an essential role in both cell-mediated and humoral antibody responses.[16,45] Vitamin A is involved with the activation of retinoic acid receptors, leading to the proliferation of lymphocytes.[45] It supports a Th2-mediated anti-inflammatory cytokine profile.[16]

Vitamin B1

Vitamin B1 (Thiamine) is involved in energy metabolism,[10,11] the metabolism of glucose,[46] mitochondrial metabolism of glucose,[13] Kreb's cycle activity,[10] immune system activation,[11] cell signalling,[11] metabolism of the neurotransmitter acetylcholine,[13] nerve structure and function,[47] is essential for nerve conduction and excitability,[48] cell-membrane dynamics,[11] and modulates cognitive performance.[49] Vitamin B1 is beneficial for fatigue,[13] weakness,[13] peripheral neuropathy,[47] irritability,[13] and memory impairments.[10,13,47]

Vitamin B2

Vitamin B2 (Riboflavin) is essential for energy metabolism,[15] normal cell function and growth,[15] and the normal functioning of the nervous, endocrine, cardiovascular, and immune systems.[31] It is involved in the normal functioning of glutathione reductase.[31] Vitamin B2 is involved in the metabolism of carbohydrates, amino acids, and lipids and the metabolism of vitamins, such as the conversion of vitamin B6 and folic acid into their active coenzyme form.[15]

Vitamin B3

Vitamin B3 (Nicotinamide, Nicotinic acid, Nicotinamide riboside) plays a significant role in energy metabolism,[12,13] modulation of inflammation,[12-14] DNA metabolism,[12,13] gene expression[12] and differentiation,[12] and cell signalling,[12,13] reduces oxidative stress,[12,14] triglyceride levels,[50] lipid peroxidation,[14] and insulin secretion,[12] and improves liver health[14] and the metabolism and conversion of folate to tetrahydrofolate.[13] Vitamin B3 assists in controlling depression,[12,13] anxiety,[13] memory issues,[13] headache,[12] elevated cholesterol,[14] dermatitis,[12] and diarrhoea.[12] In a case-control study, nicotinamide adenine dinucleotide phosphate (NADPH) concentrations in the serum of participants with chronic fatigue syndrome averaged 8.0 ± 1.4 (SD) nmol/mL. In contrast, those in the healthy control group averaged 10.8 ± 0.8 (SD) nmol/mL. Serum NADPH was directly correlated with serum Coenzyme Q10 levels.[2]

Vitamin B5

Vitamin B5 (Pantothenic acid) is involved in energy metabolism,[13] triggers immune cells to produce cytokines,[51] and is a precursor of coenzyme A.[13,51,52] It is involved in the synthesis of cholesterol, phospholipids, fatty acids, and amino acids.[13] The uses of Vitamin B5 include reducing stress,[51] fatigue,[51,52] malaise,[52] depression,[51] headache,[51] and numbness and tingling in the extremities,[13] and improving wound healing.[51]

Vitamin B6

Vitamin B6 (Pyridoxine) is involved in the metabolism of one-carbon units,[15,53] trans-sulphuration,[53] metabolism of protein, carbohydrates and lipids, in gluconeogenesis, metabolism of homocysteine, neurological development, and formation of haemoglobin.[15] Pyridoxal-5-phosphate (PLP) plays an important role in the metabolism of neurotransmitters such as serotonin, dopamine, glutamate, and gamma-aminobutyric acid (GABA).[53] Vitamin B6 supports a Th1 cytokine-mediated immune response and modulates immune cell function.[16]

Folate

Folate (folic acid, folinic acid,[54] active forms methylfolate (calcium-l-methylfolate[55] and (6S)-5-methyltetrahydrofolic acid glucosamine[55])) is essential for normal healthy growth and development,[56] plays a critical role in cell growth and division,[57] the synthesis of DNA,[56,58-60] RNA, and proteins,[56] and the synthesis of purine and pyrimidine.[15,57] It is involved in amino acid metabolism[15] and is required for critical enzymatic reactions.[15] It is involved in one-carbon metabolism,[56-58,60-63] methylation,[57,61] DNA repair,[58] DNA methylation,[15,60] and re-methylation of homocysteine to methionine.[57,61,64]

Vitamin B12

Vitamin B12 (Cobalamin, Methylcobalamin) is essential for the synthesis and regulation of DNA,[15,65] cell metabolism,[15] normal synthesis of purines and pyrimidines,[15] blood cell formation,[66] fatty acid synthesis,[15] myelin synthesis,[66] normal functioning of the nervous system,[66] homocysteine metabolism,[66] and energy production.[15] It supports a Th1 cytokine-mediated immune response.[16]

Vitamin C

Vitamin C (ascorbate) modulates immune cell function and supports Th1 cytokine-mediated immune responses.[16] Vitamin C enhances neutrophil chemotaxis and T-lymphocyte proliferation in response to infection and increases cytokine production and synthesis of immunoglobulins.[45] Vitamin C is highly concentrated in leukocytes and is used rapidly during infection.[45] Vitamin C has anti-inflammatory,[45] antioxidant,[67] and free radical scavenging effects.[67] Vitamin C interacts with other antioxidants, including tocopherol, glutathione and thioredoxin, and stimulates the synthesis and activation of antioxidant enzymes, such as superoxide dismutase, glutathione peroxidase, and catalase.[67] It is also involved in the synthesis and metabolism of collagen, catecholamines, carnitine, and the metabolism of tyrosine.[15]

Vitamin D

Vitamin D3 (Colecalciferol) plays an essential role in both cell-mediated and humoral antibody responses.[16] It regulates immune system response,[45] increases the oxidative burst potential of macrophages,[45] and supports a Th2-mediated anti-inflammatory cytokine profile.[16] Vitamin D is involved with the absorption and metabolism of calcium,[68-71] calcium homeostasis,[68] metabolism of phosphate,[69-71] bone metabolism,[68,70] differentiation,[68] and overall metabolic function.[71]

Vitamin E

Vitamin E, as tocopherols and tocotrienols, are antioxidants and free radical scavengers.[15] Vitamin E optimises and enhances the immune system.[45] It increases lymphocyte proliferation in response to mitogens, and increases the production of IL-2 and natural killer cell cytotoxic activity, and phagocytic activity by alveolar macrophages.[45] It also supports a Th1 cytokine-mediated immune response and modulates immune cell function.[16] Vitamin E protects cell membranes from oxidative damage.[15]

Vitamin K

Vitamin K, particularly K2, is involved in calcium transport,[72] calcium homeostasis,[73] is essential for coagulation[74] and production of prothrombin and coagulation factors,[74,75] prevents calcium deposition in the lining of blood vessel walls,[72] synthesis of matrix Gla protein,[72,75,76] production of osteocalcin,[75] improves cardiometabolic health,[77] and is necessary for normal bone metabolism.[74]

Coenzyme Q10

Coenzyme Q10 is involved in mitochondrial energetics,[78,79] antioxidant action,[78-81] reducing inflammation.[81] improving vasodilation.[80] Coenzyme Q10 improves fatigue in people with fibromyalgia,[82] and improves exercise capacity.[83] It also reduces statin-related fatigue.[82] A 2019 systematic review of coenzyme Q10 supplementation on fatigue found that coenzyme Q10 had significant beneficial effects on fatigue status among healthy people and people suffering from fibromyalgia, statin-related fatigue, and multiple sclerosis.[82]

Lipoic acid

Lipoic acid is an antioxidant.[84-86] Additionally, it has been found to increase the effectiveness of other antioxidants such as glutathione.[86,87] Lipoic acid acts as an essential cofactor for mitochondrial enzymes.[84-86]

Omega-3

Omega-3 is involved in eicosanoid metabolism,[88,89] cell membrane phospholipid composition,[88,89] and in the improvement of cell membrane function.[89] Omega-3 has been found to reduce depression,[90,91] stress,[90] anxiety,[90] and inflammation.[89] The cardiovascular benefits of omega-3 include improving lipid profile,[88,89] reducing platelet aggregation[89,92] and coagulation,[93] along with lowering the risk of cardiovascular disease.[94,95]

Calcium

Calcium is involved in the mineralisation of bone,[96] structural components of bones and teeth,[97] essential for bone rigidity,[98] modulation of the differentiation, proliferation, and maturation of keratinocytes and fibroblasts,[99] regulation of muscle contraction,[97,100] enzyme regulation,[97] coagulation[99] and blood clotting,[97] wound healing,[99] signal transduction,[97] and cell signalling,[99,100] including extracellular signalling and intracellular second messenger for keratinocytes and fibroblasts.[99]

Chromium

Chromium is involved in the metabolism of carbohydrates,[17,18] glucose,[19,20] lipids,[17,18,20] protein,[17] and insulin.[20] Chromium increases the efficiency of insulin.[17] Chromium has been found to

decrease cholesterol levels[101] and decrease very low-density lipoprotein-cholesterol (VLDL).[101]

Copper

Copper in the synthesis of haemoglobin,[102] functioning of neurotransmitters, the oxidation and transport of iron, cellular respiration, metabolism of glucose and cholesterol, and the formation of pigments and connective tissue.[102] It is involved in the maturation of red and white blood cells,[102] and normal functioning of B cells, T helper cells, macrophages, natural killer cells, and cell-mediated immunity.[22] Copper is necessary for growth[102] and bone mineralisation,[102] stimulates the proliferation of dermal fibroblasts, is involved in the synthesis and stabilisation of extracellular matrix skin proteins, and angiogenesis.[103] As a cofactor of superoxide dismutase (SOD), copper is involved in reducing and preventing oxidative damage to cell membranes and lipid peroxidation.[103] Copper also promotes the function of free radical scavengers such as metallothionein and glutathione.[103]

Iodine

Iodine is involved in metabolism[104] and metabolic regulation,[21-24] production of thyroid hormones,[22,23,105-107] thyroid hormone regulation,[49] neural development[104] and differentiation,[21] motor function,[108] brain development and function,[104] mental development,[21] and cognitive function.[108] Iodine is an antioxidant and a scavenger of reactive oxygen species (ROS).[107]

Iron

Iron plays a significant role in the production of haemoglobin and red blood cells.[22] Iron is an electron donor and acceptor.[109] It is required for energy metabolism,[49] production of ATP,[104] synthesis of DNA,[104] neuron development, neuronal differentiation and proliferation,[36] and is involved in the synthesis of neurotransmitters,[49] synthesis of myelin,[49] and synaptic function.[36] Iron influences immune system function, including innate and adaptive immunity,[104] plays a role in the development, proliferation, activation, and function of natural killer (NK) cells[104] and plays an essential role in the functioning of neutrophils.[104]

Magnesium

Magnesium is involved in over 300 enzyme reactions.[15] Magnesium is involved in the synthesis of ATP, DNA, and RNA,[15] mitochondrial health,[26] metabolic functions,[110] energy metabolism,[110-112] metabolism of carbohydrates, protein and fats,[112,113] glycolysis,[112,114] oxidative phosphorylation,[112,114] nerve function,[26,111,114] neurotransmission,[26]

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neurotransmitters,[26] nitric oxide metabolism,[26] regulation of intracellular calcium levels,[113] and transmembrane electrolyte flux.[112] In the musculoskeletal system, magnesium is involved in the relaxation of smooth muscle,[115] normal muscle function,[26,111] muscle contraction,[110-112,114] muscle relaxation,[112] bone strength,[26] bone metabolism,[110] bone mineralisation,[112] bone mineral density,[110] and bone integrity.[111] Magnesium is involved in the maintenance of normal muscle and nerve function, heart rhythm, and the immune system.[26]

Manganese

Manganese is essential for numerous vital process, including nerve and brain development,[116] brain physiology,[117] and cognitive functioning.[116] Manganese has antioxidant activity[22,116,117] and is a component of manganese superoxide dismutase (MnSOD).[116-118] It participates in enzymatic mechanisms that protect against free radicals and toxic derivatives of oxygen.[49] Manganese is involved in development, reproduction, immune function, bone growth, regulation of blood glucose, blood coagulation and haemostasis, energy metabolism,[117] and in the metabolism of proteins, lipids, and carbohydrates.[116]

Molybdenum

Molybdenum has versatile redox chemistry that is used by enzymes to catalyse diverse redox reactions.[119] Molybdenum forms the catalytic centre of numerous enzymes, such as nitrogenase,[120] nitrate reductases,[120,121] sulphite oxidase,[120,121] xanthine oxidoreductases,[120] aldehyde oxidase,[121,122] and mitochondrial amidoxime reductase.[122] It is involved in detoxifying excess sulphites.[121]

Selenium

Selenium is an antioxidant[15,123,124] and is a cofactor for glutathione peroxidase[15,123,125] and thioredoxin reductases.[123,125] Selenium is involved in redox reactions that can impact cellular processes, such as DNA repair.[123,124] It is essential for the endocrine system, the central nervous system, the cardiovascular system, reproductive biology, and muscle function.[123]

Selenium is functionally essential for the immune system.[123,124] It plays a role in the metabolism of cartilage and bones,[124] chondrogenic differentiation,[124] functioning of the thyroid gland[15,123] and thyroid hormones.[124]

Silica

Silicon plays a vital role in bone formation,[25,126] bone matrix quality, facilitates bone mineralisation,[126] bone health,[25] connective tissue,[25,103] and skin structure.[103] It promotes the formation of collagen,[103] promotes the synthesis of elastin[103] and glycosaminoglycans,[103,126] and maintains blood vessel elasticity.[103]

Zinc

Zinc is a component of approximately 300 metalloenzymes that catalyse more than 50 different physiological reactions.[127] Zinc is an antioxidant and anti-inflammatory nutrient.[15] It is essential for growth and development[109,128] the metabolism of RNA and DNA,[15] signal transduction,[15] synaptic plasticity,[15] and gene expression.[15] It supports a Th1 cytokine-mediated immune response.[16] Low intracellular zinc has been found to be associated with oxidative stress.[129]

N-Acetylcysteine

N-acetylcysteine (NAC) is an amino acid that has the potential to manage chronic fatigue syndrome. N-acetylcysteine has numerous properties, including antioxidant,[27,130,131] decreases oxidative stress,[27] anti-inflammatory,[130] detoxifying,[27] and mucolytic actions,[27] and improves lipid profile.[27,132] N-acetylcysteine is one of the precursors of glutathione, which is an important antioxidant.[27,131]

Carnitine

Carnitine is an amino acid that plays an essential role in cellular energy metabolism[133] in the metabolism of fatty acids,[1] and is necessary to deliver long-chain fatty acids from the cytosol into the mitochondrial matrix.[134] Carnitine has antioxidant and anti-inflammatory actions, neuroprotective function, cardioprotective effects, and improved cardiac energy metabolism.[134] A study of carnitine (2 g twice daily for 30 days) found a reduction in physical and mental fatigue, along with a reduction in fat mass, total cholesterol, and an increase in muscle mass.[133] An 8-week study of acetylcarnitine (2 g daily for 8 weeks) significantly improved mental fatigue and attention concentration.[135] Carnitine supplementation showed an amelioration of muscle soreness and improved muscle damage biomarkers.[134]

Glutamine

Glutamine is the most abundant[136-138] and versatile amino acid in the body.[137] Glutamine is essential for lymphocyte proliferation,[137,139] cytokine production,[137] macrophage phagocytic plus secretory activities, and neutrophil bacterial killing.[137] Glutamine is important for intermediary metabolism,[137] energy metabolism,[140] glycogenesis,[140] interorgan nitrogen exchange via ammonia transport between tissues,[137] protein synthesis,[141] enhances intestinal and whole-body growth,[43] cell proliferation,[140] cell integrity,[138] signal transduction,[138,141] activating intracellular signalling pathways,[138,141] and pH homeostasis.[137] Along with N-acetylcysteine,[27,131] glutamine is an essential precursor for the antioxidant glutathione.[141] In the digestive system, glutamine enhances intestinal and whole-body growth,[43] promotes enterocyte proliferation,[43,136] regulates tight junction proteins,[136] regulates intestinal barrier function in injury and infection,[43] enhances ion transport by the gut,[43] suppresses pro-inflammatory signalling pathways,[136] and protects cells against apoptosis and cellular stresses during normal and pathologic conditions.[136] Glutamine stores are depleted during severe metabolic stress including trauma, sepsis, and inflammatory bowel diseases.[136]

Probiotics

Hippocrates suggested that 'all disease begins in the gut'.[142] There is a marked comorbidity between disorders of the gastrointestinal system and stress-related conditions, such as anxiety and depression.[142] Probiotics are involved in immune system development,[30] immunomodulation,[30,143,144] digestive health,[28-30] and intestinal wall integrity.[30,144] The uses of probiotics include fatigue,[145]

depression,[145,146] anxiety,[145,147] mood,[145] stress,[148] memory,[148] sleep,[145] anger,[145,147] digestive disorders,[28-30] skin conditions,[149] inflammation,[150] and oxidative stress.[150] In a pilot study, 39 patients with chronic fatigue syndrome were randomised to receive either 24 billion colony-forming units (CFU) of Lactobacillus casei strain Shirota or a placebo daily for two months. There was a significant decrease in anxiety symptoms among those taking the probiotic vs placebo ($p = 0.01$).[44] A 1910 study found that a gelatin-whey formula with live lactic acid bacteria improved symptoms of depression in adults with melancholia.[151]

Lactoferrin

Lactoferrin is an iron-binding glycoprotein[152-156] of the transferrin family.[152-155] It is a cell-secreted mediator that bridges innate and adaptive immune function.[156] Lactoferrin is considered a first-line defence protein involved in protecting against microbial infections and in the prevention of systemic inflammation.[156] Lactoferrin has immune-modulating activity,[156] bacteriostatic and bactericidal effects,[156] antiviral,[152,156] antimicrobial,[152-154] anti-parasitic,[152,156] anti-fungal,[152,156] anti-inflammatory,[152-154] antioxidant,[152,156] reducing oxidative stress,[156] and iron-binding[156] activities. As an antioxidant, lactoferrin reduces intracellular reactive oxygen species (ROS).[156] The antibacterial activity of lactoferrin has numerous mechanisms of action, including iron sequestering, altering bacteria virulence, altering bacterial growth, proteolytic activity, preventing biofilm formation, and interfering with cell adhesion.[152]

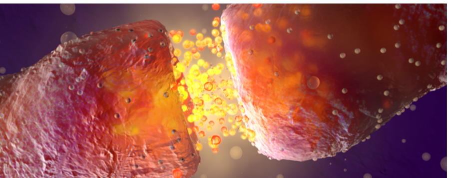
Water

This leads us to water and hydration. Hydration via regularly drinking water is essential for metabolism,[157] cellular homeostasis,[157] temperature regulation,[157,158] and circulatory function.[157] Water acts as a carrier for nutrients and waste products[158] for substrate transport across membranes.[157] NHMRC guidelines for adequate water intake is 2.1 L/day for females and 2.6 L/day for males.[159]

Conclusion

Chronic fatigue syndrome is a debilitating fatigue condition that affects many body systems and has a wide range of symptoms. Nutritional medicine plays a major role in the management of chronic fatigue syndrome via various mechanisms of action. Further research is suggested to determine the causes, biomarkers, and management of chronic fatigue syndrome.

For a full list of references, please email the Editor: ***sandra.grace@atms.com.au***



Understanding Chronic Pain Management

The benefits of saffron and PEA and their influence on the endocannabinoid system

Chronic pain is on the rise and sufferers are more likely to experience psychological concerns such as depression, anxiety and sleep disturbances. PEA and saffron have the unique ability to influence the endocannabinoid system and in turn, manage chronic pain and its associated symptoms.

Chronic pain is persistent pain lasting more than 3-6 months. **Over the past 10 years, general practitioners have seen a 67% rise in patients experiencing chronic pain.**[1] Chronic pain is complex and it is often reported that chronic pain sufferers concurrently experience psychological distress and symptoms such as poor mood and sleep.[1] The body is equipped with a variety of mechanisms and systems to alleviate and resolve pain, including the endocannabinoid system. **Compounds, such as palmitoylethanolamide (PEA) and *Crocus sativus* (saffron), have the unique ability to influence the endocannabinoid system** and in turn, manage chronic pain and its associated symptoms.

The endocannabinoid system is involved in the modulation of pain and inflammation. Cannabinoid 1 (CB1) receptors are located within the brain and central nervous system whilst cannabinoid 2 (CB2) receptors are found primarily in peripheral tissue and cells of the immune system.[5] Endocannabinoids are produced endogenously or can be supplied exogenously to manage pain. Whilst PEA is not a cannabinoid itself, it is a naturally occurring endogenous fatty acid that is produced in response to inflammation or injury. In conditions such as chronic pain, it has been noted levels have been altered, highlighting the benefit of PEA supplementation.[3]

PEA works through:

- Enhancing tissue levels of anandamide, a cannabinoid that acts upon CB1 and CB2 receptors, providing analgesic properties.[6]
- An affinity to PPAR-α receptors, which reduces inflammation and the secretion of pro-inflammatory signalling molecules.[6]
- An affinity to receptors GPR55 and acts to desensitise TRPV1 which is involved in the sensation of pain and heat.[7]
- Inhibition of mast cell degranulation and subsequent histamine release whilst controlling glial cell behaviours.[3]

Ultimately, **PEA provides analgesic, anti-inflammatory and neuroprotective benefits**. Due to its fatty nature, PEA has poor absorption. Levagen+ is considered a superior form of PEA which utilises LipiSperse® technology to increase bioavailability.[6]

Saffron is a notable adjunct therapy to PEA as **chronic pain sufferers are more likely to experience psychological concerns such as depression, anxiety and sleep disturbances.**[1] **Saffron has been shown to provide anti-inflammatory, antinociceptive, immunomodulatory, analgesic, antidepressant and anxiolytic effects.**[8]

Saffron works through the following mechanisms:

- Attenuates pro-inflammatory mediators such as TNF-α and IL-6.[8]
- Reduces eosinophils, neutrophils and lymphocytes, leading to a down-regulation of leukotrienes, prostaglandins, cytokines, ROS and NO.[8,9]
- Partial agonism and selective desensitisation of the TRPA1 channel.[10]
- Antioxidant activity reduces oxidative damage by attenuating endogenous ROS.[11]
- Reuptake inhibitor of dopamine, serotonin, and norepinephrine.[11]

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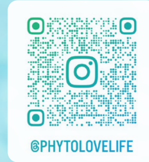

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An Update on Research in Homeopathy

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Homeopathy works. For those of us who use it regularly that's an incontestable fact. But for many potential clients our confidence that homeopathy works may not be enough for them to want to use it without some form of objective evidence – evidence of a positive clinical outcome from someone they know and trust, or objective evidence from some other trusted source. While there's debate about the validity of the standard clinical trial, it currently serves as a trusted source of evidence and is the generally accepted tool used to assess the effects of a clinical intervention. There is a large body of human, animal, plant and in vitro trials that attest to the effectiveness of homeopathy and homeopathically potentised substances. Following are summaries of some recent examples of that evidence taken from peer-reviewed journals.

Human Studies

1. Miglani A, Manchanda RK. Azadirachta indica in treatment of acne vulgaris–an open-label observational study. Indian J Res Homoeopathy, 2014, 8, 218-223. This prospective, non-randomised, open-label interventional study was conducted to assess the effect of the homeopathic medicine Azadirachta indica prescribed in increasing potencies from 6C up to 1M in the management of acne in 29 people diagnosed with the disease. The observational period was 6 months. Outcome measures were lesion counts, Global Acne Grading System (GAGS) score and Acne-specific Quality of Life questionnaire (Acne-QoL) scores. Data were analysed using paired t-test, Wilcoxon signed rank tests and Pearson's correlation tests. At the end of the study it was found that the use of the medicine was associated with a statistically significant improvement in lesion counts, GAGS and Acne QoL score ($P < 0.001$) but no effect was seen in inflammatory lesions.

2. Alizadeh Charabandabi SM, Biglu MH, Yousefi Rad K. Effect of Homeopathy on Pain Intensity and Quality Of Life of Students With Primary Dysmenorrhea: A Randomized Controlled Trial. Iran Red Crescent Med J, 2016, 18, 9, e30902. The objective here was to evaluate an association between homeopathy and pain relief and quality of life improvement in a double-blind placebo-controlled randomised trial with two parallel arms. Fifty-four students with primary dysmenorrhoea residing at the dormitories of the Tabriz University of Medical Sciences, Iran, who had moderate or severe menstrual pain, were randomised to receive either a homeopathic remedy or placebo. The homeopath and participants were blinded to treatment assignment. Primary outcomes were pain intensity and quality of life assessed using a 10-cm visual analogue scale and short-form 36 (SF-36), respectively, and the secondary outcome was number of analgesic pills used. Each group initially comprised 27 students, with 26 in the homeopathic group and 21 in the placebo group able to be followed up. Compared with the baseline scores, statistically significant improvements were observed in pain intensity ($P = 0.021$) and physical health ($P = 0.020$) scores only in the homeopathic group, and in the mental health score in both groups ($P = 0.014$ in the homeopathy group and $P = 0.010$ in the placebo group).

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4. Kumar M, et al. Use of homoeopathic remedies in the management of learning disabilities. Indian J Res Homoeopathy, 2014, 8, 87-94. The objective of this study was to assess the therapeutic usefulness of homeopathy in the management of learning disabilities (LD), viz., dyslexia and dysgraphia. A 3-year randomised double blind case control study was carried out in 3 Marathi-medium schools in Mumbai on 67 children between ages 8-12 years fulfilling the criteria of LD (ICD-10) for dyslexia and dysgraphia with a minimal observation period of one year. The children, all of whom fulfilled the criteria of LD (ICD-10) for dyslexia and dysgraphia, were studied for a minimal observation period of 1 year. All received remedial education as it is the standard mode of management. Thirty-two children constituted Group I and were

administered the indicated homeopathic medicine in the 200th potency in infrequent repetition while 35 children from Group II were given placebo. The children and the Remedial Educators who were the assessors were blinded for the study. The researchers found that the children under homeopathic treatment with remedial education, when compared to the control group, showed an earlier response to remedial inputs and a statistically significant change in the indicators of dyslexia and dysgraphia. There was also a significant change in the co-morbid behavioural condition notably Attention Deficit Hyperactivity Disorder (ADHD).

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All Things Inflammation: *Lisa Costa-Bir interviews Dr Tim Crowe*

This is an edited transcript of part of a podcast interview presented by FX Medicine. JATMS gratefully acknowledges the consent of FX Medicine to publish material from their series of broadcast interviews of leading practitioners of natural medicine. Dr. Tim Crowe is a research scientist, a dietician, co-author of *Understanding Nutrition*, now in its fifth edition, and he also hosts his own podcast, *Thinking Nutrition.*

KEY POINTS COVERED IN THIS EXTRACT

- Understanding that resolving inflammation, as opposed to reducing it, is important for long term patient care. The analogy given is a raging fire that when contained to a barrel reduces but continues to smoulder. However, pouring water over the fire extinguishes the flames, but putting the fire out resolves the issue.
- Novel metabolic pathways for resolving inflammation include metabolites of omega-3 and omega-6 where the metabolism continues on from EPA/DHA and AA respectively. We're all able to produce these metabolites endogenously while in a healthy state but certain risk factors and conditions detract from our ability to make adequate amounts.
- Pathology tests to help measure and assess inflammation include:
  - CRP - for measuring severe levels of acute inflammation.
  - hsCRP - useful for sub-clinical inflammation, the more sinister type, has a higher sensitivity so can be a useful analyte for patients presenting with signs and symptoms of chronic inflammation or "sickness behaviours" and tracking improvements.
- Connections between stress on the HPA axis, the gut-mind connection, and inputs to the vagus nerve cannot be discounted as this contributes to overall inflammation levels. Loneliness and isolation are also shown to increase inflammation.
- Sleep issues are well researched for their role in triggering inflammation. Lack of sleep also increases risk of poor dietary choices leading to metabolic issues and gut dysbiosis which further increases inflammatory processes.
- Physical activity – any physical activity – is better than being sedentary. Tim suggests doing what works, doing what you enjoy, and doing what you can do regularly. It all adds up.

Lisa: Low-grade chronic inflammation is at the heart of most of the conditions that we see in clinic, and it's estimated that one in three Australians has a chronic inflammatory disease. So Tim, can you start by telling us a little bit more about inflammation, which is such a complex area, and is inflammation necessarily a bad thing?

Tim: Yes, inflammation really underpins many of the chronic diseases we are faced with in Western countries like Australia. So, while it's widely thought of as a really bad thing, it's actually a good thing as well. We actually need inflammation. It's part of our body's immune system. If you cut your hand, if you fall over and graze your knee, that redness and pain that you see and feel is acute inflammation. That's part of the body's way it deals with the acute injury. And then, over time, that inflammation is suppressed and then the body regenerates and heals. So, inflammation's critically important. It's part of our body's natural defence system. It's when it's chronic that that's the problem. If you think about, if it's a fire that is not put out, that fire keeps doing a lot of damage. So, inflammation is great short-term because of the changes it causes, but long term it's very harmful for our health. Inflammation you can see and feel is generally going to be acute inflammation, but the bad sort is the chronic inflammation, which you're really unlikely to know that you've got. It underpins many of our diseases, and it's more systemic. So, it's not that inflammation is in itself bad, but too much of it for too long is the big problem.

Lisa: What happens internally when you've got chronic inflammation because, as you said, sometimes we can't actually see that in the same way as acute inflammation? So, say someone has an autoimmune condition, or atherosclerosis, what's actually happening internally with chronic inflammation?

Tim: What's happening is there's a whole lot of systems involved. One of them is one of the key immune cells, white blood cells, those macrophages. They will go to a site of infection or damage, and initiate cascades with other immune cells to release cytokines, which are signalling molecules that really mediate a lot of the inflammatory process. That can be systemic if there is some form of injury or infection all throughout the body, and you necessarily won't know that's happening directly. The presence of disease may indicate

it, but there are ways we can actually measure this by a blood test. And one of them is the blood test for CRP, C-reactive protein, which is a really nice marker for inflammation. And there are two different types. There's really severe acute inflammation, such as advanced cancer where the body is breaking down, when you could have CRP levels that are in the hundreds of milligrams per decilitre. Where it's very subclinical, we can use another test called hs-CRP, which is a high-sensitivity CRP test. That may not measure really high levels, but it's enough to show that the CRP levels are higher than normal. And CRP is a marker of the inflammatory response. So, there are ways we can measure it by a blood test, and it's a very robust marker of overall inflammation.

Lisa: So, do you think it would be correct to say that patients don't necessarily have to have elevated levels of CRP and ESR on their bloods for there to be inflammation present?

Tim: That's correct, but it also depends what test is done. Most of the time, it's just called CRP, which is more of a measure of inflammation; hence this other test, hs-CRP, which is really designed to pick up levels of inflammation still more in the reference range of 0.5 to 10 milligrams per litre. That's not as common a test, but it's a good predictor of things like cardiovascular disease. So, if those tests are available, it's useful. But for a very low subclinical condition, a standard CRP test might not show it (though there'd be signs and indications it could be present as well). So, clinical judgment is called for as well. When you're doing history, are there potential other things ticking off boxes related to lifestyle factors, for example, that could exacerbate that? And we'll examine later the big lifestyle factors that can affect inflammation.

Lisa: Yes, I understand that 'sickness behaviours', like fatigue, altered sleep, can also be manifestations of inflammation.

Tim: Absolutely. And you could add in there, physical inactivity. Are patients carrying a lot of weight around the middle? We know that with adiposity, particularly central adiposity, those fat cells are not at all inactive. There are actually more macrophages in fat around our middle, and these macrophages, as I've already mentioned, are part of the inflammatory cascade. So, metabolically, active fat around the middle is a risk factor for inflammation, as well as for metabolic syndrome, CVD, type 2 diabetes. But having a poor diet, poor sleep, as you've mentioned, that's a big issue. Pollution, infection and smoking can all worsen inflammation, which then can tip you over the edge for such conditions as Hashimoto's disease, rheumatoid arthritis, and so on

Lisa: Really interesting, because a lot of patients have multiples of those. They don't just have the chronic infection and the sedentary lifestyle, they've got issues with their diet, and dysbiosis, and so on.

Tim: Yes, all of those are related. And that's really just with clinical judgment. You don't just treat the condition, say, Hashimoto's disease or rheumatoid arthritis, you look at all these other factors which will impact upon inflammation that are underpinning those conditions in the first place.

Lisa: In your latest edition of the textbook, there's a lot more focus on intestinal dysbiosis. So, what are your thoughts on the microbiome and dysbiosis and how that affects inflammation?

Tim: Yes, the gut microbiota is the hottest of hot topics, just for the number of systems it affects. And there is unlikely to be one perfect healthy microbiome that is the same for everybody: it's highly individualised. We know that decreased diversity, that's the number of distinct species, is a big marker for dysbiosis. Now, the problem when you change your gut microbiota is that among the metabolic products they're involved in producing, one of them, of course, is going to be the short-chain fatty acids, which are key mediators of reducing inflammation in our body. A positive diet that's full of minimally processed plant-based foods, with lots of probiotics, is certainly linked with production of more of these short-chain fatty acids. And they're almost what I consider key signalling molecules in reducing inflammation. The opposite is true with poor diet and all the other lifestyle factors that go with it: then you see dysbiosis. That means you get less of these metabolic products, and that will loosen the handbrake on control of inflammation. That's probably one of the key mediators with our gut and inflammation. So, it's just the change in the metabolic by-products, and it's probably the short-chain fatty acids, I think, are the key metabolites involved in this.

Lisa: So, when it comes to dysbiosis, I know stress can very much harm our microbiome increase inflammation.

Tim: Absolutely, and I'm not talking about just small amounts of stress every now and then, but constant stress, that will affect the HPA axis as well, cortisol responses, and so the cascade goes on. So, that's probably an alternative pathway feeding into inflammation or a different effector coming just from emotional stress. But we know that our gut is not in isolation. There is direct crosstalk between our gut and our brain, and that also controls our stress responses, and the vagus nerve is certainly very important in that process. So, even though stress can be external, it affects the brain. It can affect the HPA axis. Also, again, our gut microbiome will actually register that stress, and be affected by it. It's all very closely interrelated, but I'm adding a bit more detail to the molecular mechanisms that are occurring for all of these environmental lifestyle factors that we know affect our health.

Lisa: And there's some really interesting research on loneliness, which is kind of a stressor in its own way. For some time we've known that perceived loneliness

is associated with poorer outcomes, increased risk of cardiovascular disease and so on. Research in 2020 that examined the role of perceived loneliness in inflammation found that individuals who perceived themselves to be lonelier actually had higher levels of the inflammatory cytokine IL-6. And so I just find that really, really interesting because when we have patients in clinic, we're often very focused on diet, and I think we look less at trauma, and stress, and things like that. But it's such an important factor to consider when trying to reduce inflammation, too.

Tim: Yes. Loneliness is really considered to be approaching epidemic proportions in Western society. The UK now has a Minister for Loneliness. They're treating it so seriously because of all of the health problems that go with it. Loneliness can be related directly to stress, but it can also mean your diet could be less than optimal because you are eating alone and you don't have as much motivation to make changes. Once depression kicks in, that will aggravate a whole lot of problems. So, yes, loneliness both aggravates other stress factors , but also of itself will contribute to inflammation.

Lisa: What about sleep? Because a lot of my clients really struggle with getting to sleep. They tend to stay up very late. Does that contribute to inflammation?

Tim: Absolutely. A lot of research has been done on sleep, particularly on shift workers, which provides a great model for understanding the effect of sleep deficit on inflammation: shift workers have a much heightened risk of obesity and metabolic disease, and insulin resistance, and all of that is underpinned by inflammation. Shift work and poor sleep habits could also be a marker for poor diet, which, of course, in turn will affect gut microbiome and inflammation. All of it's related.

Poor sleep habits affect all of our systems. They can affect mental health and play a part in depression as well - all related. So, yes, getting good sleep habits is really a cornerstone. Diet, sleep, exercise, probably the Holy Trinity of good health. Plus, of course, social connection.

Lisa: So, we've talked about some of the things that cause inflammation. A lot of conditions are characterised by unresolved chronic low-grade inflammation, right? Can you take us through some of those?

Tim: Okay. Let's go through a list. Cardiovascular disease, type 2 diabetes, metabolic syndrome, autoimmune diseases, so, rheumatoid arthritis, Hashimoto's disease, inflammatory bowel disease, that's going to be Crohn's and ulcerative colitis. And then there are neurological conditions, so potentially Alzheimer's disease, multiple sclerosis. Then cancer, particularly colorectal and breast cancers, have some inflammation as part of that as well. So, there we go. All the big ones.

Lisa: Yes. So, we've really got to be considering, I guess, resolving chronic inflammation in pretty much every client that comes in, don't we?

Tim: Yes, correct.

Lisa: Yes, and I think a lot of practitioners really focus on trying to reduce inflammation in clients who display obvious chronic inflammation. But is there a difference between just reducing inflammation and resolving it?

Tim: There certainly is. So, maybe a good analogy would be a raging fire burning in a closed space: if you reduce the oxygen to it, the fire will dampen down, but it will likely still be there. So, that's helping to *reduce* it. But if you want to *resolve* it, you throw a bucket of water on it and you get rid of the inflammation.

My own research program has been a lot of work in pressure ulcers. Pressure ulcers are a chronic inflammatory condition: that constant blocking of the blood supply, say, to the hip, or the leg, or the heel, results in a wound. But that wound doesn't heal because the inflammation just persists and persists. Helping to resolve the inflammation allows the body to heal itself, and to heal the wound. So it's one thing to help reduce inflammation - and there are lots of lifestyle interventions to contribute to that - but it's another thing to resolve it completely. And that's getting into, I guess, a lot of the chronic diseases. So, yes, there's a subtle difference: reducing is good, but resolving is just as important.

Lisa: I've read in some research that there are broken pathways, that some of the pathways that help to reduce our inflammation aren't doing that properly.

Tim: Yes.

Lisa: And it's typically in a lot of those clients you mentioned, the ones who are obese or have that chronic inflammation, metabolic syndrome, and so on.

Tim: Exactly. This is very much emerging research, but when looking at those metabolic pathways we're talking about our essential fatty acids of the omega-3s and omega-6s. They are metabolised in the longer chain forms. For the omega-3s, it's going to be EPA and DHA. For the omega-6s, it's arachidonic acid. But it doesn't end there. There's a whole cascade of further metabolites of those fatty acids, which are involved in helping to resolve inflammation. And it's pretty complex stuff. It's emerging research, but there's interest in these metabolites' potential to help nip inflammation in the bud. These are called specialised pro-resolving mediators, and it's something we'll be hearing more about. So, it's really the next step from our fish oil and arachidonic acid. It's really what they're metabolised into. And there's a whole very complex pathway that I still struggle to understand. It's fascinating stuff.

Lisa: Totally. Yes, my understanding from my reading is that we all produce them naturally in that acute inflammation.

Tim: Yes, correct.

Lisa: But where there is obesity, where there are autoimmune conditions, for example, sometimes we don't actually convert the omega-3s to the SPMs. [Specialised pro-resolving mediators (SPMs), also known as resolvins, protectins, and maresins, are enzymatically synthesized from the n-3 polyunsaturated fatty acids (PUFA) eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA).(1)]

Tim: That's right.

Lisa: Yes. I'm really interested in Hashimoto's disease, and I found this study showing that there were lower levels of these specialised pro-resolving mediators in individuals with Hashimoto's disease, and their antibodies went up as the SPMs went down, which I thought was really interesting. As yet there are no studies specifying SPMs, but those that I've read propose that chronic unresolved inflammation is probably a driver for those autoantibodies going up.

Tim: It's a perfect way of explaining it: that fish oil may help reduce inflammation, but to really resolve it, you need the further metabolism of the EPA, DHA, and so on. And if there are things happening internally to cause blocks, that could be an issue. Hence, the idea in the future of taking the actual SPMs, which are the downstream metabolites of EPA, DHA, and arachidonic acid to help resolve the inflammation, rather than just dampening it down.

Lisa: So, we've talked about the underlying drivers and some of the conditions associated with inflammation. I'd love to talk to you about lifestyle. What are your favourite lifestyle strategies for treating clients with this chronic unresolving inflammation?

Tim: Okay. There are a lot, but I'll talk about two that are really important. First, it's going to be diet, focusing on prebiotic fibre. There are so many different types of prebiotic fibre we're actually learning more and more about - there's a wide range of different chemicals and plants that can influence that gut microbiome. Even polyphenols, we now know, can be metabolised by the gut microbiome. In fact, they play an important part this process.

So, a simple thing I'd say to so many people is that when it comes to diet, don't try and heroise one particular food as *the* anti-inflammatory food. It's a diversity of foods that provides benefit, and colour is a fantastic guide to a diversity of prebiotic fibre in all plant foods. Certainly, turmeric, for example, or fish oil, all the well-known prebiotic foods, are important. But colour is the best guide.

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The Problem *with Copper*

Part 1

Jon Gamble | BA ND ADHom

Abstract

Copper excess is the most common toxic picture seen in practice due to environmental, iatrogenic and genetic reasons. This article discusses the clinical consequences of copper excess. Part 2 will present cases of copper excess manifesting in mental health conditions.

A benign and essential trace element, copper in excess is also the most common toxic element that I see in practice. Why do I call it both a benign and toxic element in the same sentence? This question contains a key to understanding the complexity of many chronic diseases.

First, we will look at the benefits of adequate dietary copper. Second, we will look at what happens if copper absorption, retention and excretion are dysfunctional: this leads to copper excess and can be a precursor to chronic disease.

Copper as a nutrient

Essential functions of copper include:

- Cardiovascular health
- Vital for ATP (cellular energy) production, especially Cytochrome c oxidase functions
- With zinc and manganese, copper combines to form zinc-superoxide dismutase, an important anti-oxidant
- Adequate iron uptake into the cells
- Connective tissue and myelin formation
- Enzyme pathways of serotonin, histamine and dopamine, as well as synthesis of epinephrine and norepinephrine
- Melanin formation
- Immune function - T cell function - low copper can be seen in neutropaenia.

Copper as a toxin

I am devoting a lot of space to discussion of copper toxicity because, in my experience, true copper deficiency is uncommon, whereas copper-toxic symptoms are common.

In my opinion, copper toxicity is becoming a primary underlying, sustaining cause of chronic disease in the modern age. This is a bold statement but please read on. Children may be affected by high levels of copper which they acquire from their parents, and their parents before them. Each new generation can inherit the copper burden and, when combined with zinc deficiency, they can accumulate a level of copper greater than that of the previous generation. This means that disease symptoms can appear earlier in the lives of children and, unless that high copper is recognised and removed, it promotes passing the copper burden on to the next generation. Think of it as a 'toxic miasm', in homeopathic terminology. Writing in the 1970s, Carl Pfeiffer described copper as the 'fourth heavy metal intoxicant'.[1] This is a prescient description.

Why high copper levels?

Copper is used in pesticides, wood preservatives and other industrial applications. But one probable cause of the growing prevalence of copper toxicity is water fluoridation. We know that fluoride may draw out the copper found in water pipes.[2] We also know fluoride is a highly reactive electron scavenger, attacking living tissue, interfering with calcium and phosphorus deposition.[3]

My reason for considering fluoride as the most likely issue in copper accumulation is the increasing levels of copper I have found in patient test results over the last three generations since the 1970s, when fluoride was introduced into the

municipal water supply across Australia. Over those three generations, the levels of copper evident in Hair Tissue Mineral Analysis in my inter-family patient selection have mushroomed. Fluoridation of the water supply may thus be my best guess. Many countries add fluoride to their municipal water. However, continental Europe, very sensibly in my opinion, does not.

All about genes

Apart from environmental considerations, many of which can only remain theories pending population studies, genes have a role in copper toxicity. This is particularly the case with patients who have kryptopyrroluria (KPU), an inherited enzyme defect which prevents the absorption, and accumulation, of zinc, manganese, magnesium and vitamin B6. If these nutrients are not bio-available, copper is unable to be adequately excreted. Copper accumulates, particularly in the liver, resulting in biliary tree blockage. Biliary tree blockage causes a variant of Irritable Bowel Syndrome (IBS) where there is nausea, flatulence and constipation alternating with diarrhoea. This type of IBS is common in females. In my opinion, high levels of copper also affect mood, and are neurotoxic, resulting in tics, fasciculations and spasms of the muscles.

Depression and anxiety can also result, particularly in females. In boys, I have observed high copper as a major cause of Attention Deficit Hyperactivity Syndrome, Obsessive Compulsive Disorders, and other lower-level Spectrum Disorders.

Since I have been in practice for over 30 years, I have seen three generations of families, and have consequently arranged three generations of mineral testing. I have observed that trans-generational copper toxicity is a definite phenomenon. Inherited copper excess can pass from grandparent to grandchild and miss the intermediate generation. It can be found in cousins of the patient. One sibling may inherit high copper, the other may not. Often it is the first-born child who inherits the copper. Occasionally it is the second or third child.

Some patients do not show high copper when I first test, either with Hair Tissue Mineral Analysis or with Oligoscan (which uses spectrophotometry to assess levels of minerals and heavy metals). But after a couple of months of taking zinc supplements, the true copper picture becomes evident on subsequent test results. The zinc, being a copper antagonist, 'flushes out' the true picture of underlying copper burden.

Wilson's Disease

A serious genetic disease in which copper causes structural damage to the liver is Wilson's Disease, affecting 1 in 30,000 people.[4] Large amounts of copper are deposited in the liver and other tissues. However, the copper toxicity referred to in this chapter is not a discussion of Wilson's Disease. I am confining myself to the discussion of functional disease as a result of copper excess. No structural damage occurs in non-Wilson's copper toxicity, and the cases discussed in this chapter do not have Wilson's Disease. Although no structural damage occurs in copper toxicity, if this toxic accumulation continues without intervention, fatty liver and eventually liver cirrhosis may occur.

Why does copper become toxic if it's a micronutrient for humans?

Traces of copper are a normal and essential finding in human tissue. Excess amounts are toxic. One method the body uses to keep copper at correct levels is to chelate it with zinc, which is copper's natural antagonist. Without zinc, copper accumulates. zinc also stops the bio-accumulation of other toxic elements, especially cadmium and mercury, which are the two elements which you definitely do not want accumulating in your cells.

Up to 30 percent of Australians are low in zinc. This is because the Australian soil is notoriously low in this essential mineral.[5]

Copper and oestrogen

Now add oestrogen to the high copper picture and the problem is more complex. The symptoms may start, as in Susan's case (below), when the girl commences her menstruation, but more commonly when she is given the oral contraceptive pill (OCP) . The OCP may be prescribed for period pain management, acne or contraception. In my opinion, this will be the next phase of the underlying toxicity caused by the meeting of copper with exogenous (externally derived) oestrogens. I have observed many women describing the onset of their Irritable Bowel Syndrome as shortly after they started taking the OCP (despite their doctor's assurance that it has no link to the gut).

Xenoestrogens

It would be simple if the OCP were the only cause of exogenous oestrogen. Unfortunately it is not. We also have the xenoestrogens, some of which are found in the substances below. 'Xenoestrogen' refers to chemicals, whether synthetic or naturally occurring, which exert an oestrogenic influence upon human tissue, both males and females.

- Pesticide residues found in fruit and vegetables
- Personal care products (e.g., those containing parabens)
- Food-grade plastics containing Bisphenol-A (BPA) because this leaches from the plastic into the food.

Let us have a brief look at the research on just one of these xenoestrogens. Many food-grade plastic containers contain BPA, now acknowledged as a human carcinogen in men as well as women.[6] It is also one of the causes of precocious puberty, with girls developing breast tissue and pubic hair much earlier. One woman phoned my clinic to say her baby was growing pubic hair, which stopped once she ceased using her plastic baby bottle and changed to a non-BPA version. Fortunately, in late 2010, the baby bottle manufacturers in Australia all signed up to a government-fostered industry initiative to stop using BPA in

the manufacture of baby bottles.[7] Years earlier it had been banned in Canada and many states in the USA.

One might ask the question: Are not tiny doses acceptable? In my opinion, the answer is no, because chemicals like BPA exert biological influence in nano-doses. One study demonstrated that applying BPA to prostate cells at 25,000 times less that the assumed active dose still stimulated growth of those prostate cells.[8] This suggests that prostatic hyperplasia is triggered by micro amounts of BPA.

So now we have:

- Congenital accumulation of toxic levels of copper, which worsens with age
- Accumulation of exogenous oestrogens (xenoestrogens) either through the OCP or other sources
- An excess of endogenous (natural or internally generated) oestrogen, called oestrogen dominance.

The concept of oestrogen dominance was pioneered in the 1980s by Dr John Lee,[9] but is not generally recognised in conventional medical circles. Natural (endogenous) oestrogen dominance, plus accumulation of xenoestrogens, (which are exogenous or externally derived), while an alarming health care issue, is a phenomenon which largely falls outside the radar of conventional medical diagnostics.

The human body will use all its resources to keep the blood, and the vital organs through which it passes, as healthy as possible. This is called homeostasis. The excess oestrogens end up in the liver. It is there that they meet up with the toxic load of copper and combine in a toxic sludge, resulting in biliary tree congestion (not gallstones). If this toxic congestion continues it can progress to non-alcoholic fatty liver disease.

This is the common picture when there is a high hepatic load of copper and xenoestrogens. The patient will complain of nausea, fatigue and IBS symptoms.

If there is mood disturbance it is more commonly anxiety alternating with depression. Often the depression will be worse at menstruation and the anxiety worse at ovulation. Depression may be severe immediately after childbirth and, as in Susan's case (Case Study 1 below), receive a diagnosis of post-natal depression.

A myriad of symptom patterns can occur in patients with copper excess. Many of these patients will have high pyrroles when tested for kryptopyroluria (mauve factor). These patients are unable to store their dietary intake of zinc and vitamin B6; they may require a daily supplement of these for life.

Case Study 1: Irritable Bowel Syndrome

Susan: Anxious, hopeless, depressed

It was during both pregnancies that Susan started to have real trouble with her digestion. She had always had a "niggly tummy" as a child. If there were a tummy bug going around then she would always catch it. Vomiting and diarrhoea occurred daily.

She knew about morning sickness but had no idea that she would experience severe vomiting and nausea for most of the pregnancies. For her second pregnancy she was even hospitalised for dehydration and given the drug Maxalon® to stop her vomiting.

In both deliveries her contractions stopped so she was given a hormone drip. Her abdominal symptoms worsened after these drugs. But this was no surprise to her since she had never reacted well to the oral contraceptive pill either. When she first tried the OCP as a teenager, it gave her severe migraines and nausea, so she decided to never use it again. When the hormonal drips were used to keep her labour going during both deliveries, the symptoms reminded her of the earlier time when she had used the OCP.

After childbirth, her abdominal symptoms became much worse. Every day she experienced nausea, flatulence and diarrhoea. There were some trigger foods that she knew to avoid, such as chocolate, avocado and mushroom, but the confusing thing was that her food sensitivities seemed to change. One day she was okay to eat a salad, but next time it gave her excruciating wind. Eventually she stopped eating all fruit and vegetables, and confined herself to bread and chicken, no fats or oils, nothing spicy and minimal red meat. She was not cured on this restrictive diet. She still had her symptoms every day but the intensity of the symptoms was reduced. She took probiotic supplements, which helped a little, but still she had an ongoing problem.

Her doctor ordered a series of pathology tests: endoscopy to check the stomach and oesophagus; colonoscopy to check the bowel; ultrasound to look for gallstones or abdominal masses. All these tests came to nothing, so she was diagnosed IBS. Eventually, as various IBS treatments failed to achieve improvement, her doctor told her she had post-natal depression and recommended antidepressants.

Susan had some anxiety and depression. But if you had ongoing abdominal pain and nausea for years without any sign of anyone being able to help you, let alone give you a concrete diagnosis, wouldn't you feel anxious, hopeless, depressed?

Not long after her second child was born she started to develop breast lumps. With each monthly cycle the lumps became more painful. It was at this point in the evolution of her illness that Susan decided to try homeopathic treatment.

Copper

The above case study illustrates how excess copper accumulation can congest the gallbladder, not with calculi, but sludge. Bile sludge cannot be seen on ultrasound. A young woman, like Susan, will begin to experience a variety of gut symptoms, diagnosed by exclusion as IBS. At this point of the patient's life, treatment is relatively straightforward, as in Susan's case. If the gallbladder and liver are not cleared, and copper continues to accumulate, she is likely to develop endocrine disturbance and oestrogen-driven neoplastic tissue: endometriosis, fibrocystic breast disease and possibly malignancy later in life.

Treatment

Susan's digestive symptoms, which were diagnosed as IBS, are just the beginning. The toxic mixture of oestrogenic chemicals, copper accumulation, low zinc, and maybe natural oestrogen dominance, creates a complex symptom picture.

First fix the liver

It is vital to open the biliary channel of excretion, as, in my opinion, this is where all the symptoms lie. Ninety-five per cent of copper is excreted through the liver, congesting the biliary tree and producing the picture of nausea, flatulence and diarrhoea, diagnosed as IBS. This is almost always corrected by Greater Celandine, Chelidonium maj, given in herbal liquid extract, 5 to 15 drops per dose, before food (= three doses daily). If the patient has chronic constipation, they may need the stronger dose of six doses per day taken before and after food. Those with nausea, like Susan, or with diarrhoea, will require less: three doses per day, and lower drop doses.

The patient is likely to experience symptom improvement from the first few days and that will continue until the end of treatment. I mostly use the herbal extract because it seems to work for everyone, although in rare cases a very sensitive patient would do better with an attenuated dose, prepared in the homeopathic method of succussion and dilution, Chelidonium 3x or 6x. The medicine often requires continuation for several months. Encapsulated versions of this herb do not work as well as liquid doses.

Also attend to the oestrogen excess

At the same time, it is important to neutralise and excrete the excess oestrogens. I use the homeopathic remedies described here. When those oestrogens are exogenous, that is they come from sources outside that patient, most commonly from the OCP, *Folliculinum 30c*, one dose every second day for 6 weeks, works well. Sometimes I need to go up to the 200c potency if symptoms persist. In other cases, a new symptom picture may emerge, indicating the need for a new medicine, often *Sepia,* sometimes *Cimicifuga*. In all cases, I expect to see rapid improvement in the IBS.

To standardise this treatment, we have our own formula, known as *Protocol 3 (Xenoestrogens)* (available from the Melbourne (Australia) Homeopathic Pharmacy: Martin and Pleasance) which contains homeopathic potencies of parabens, food grade plastics, the homeopathic remedy *Folliculinum,* and other xenoestrogenic substances. Given once every second day over several weeks, this formula provides an adequate detoxification of accumulated xenoestrogens. Patients who take this detox may report 'hormonal' symptoms, such as hot flushes, or breast tenderness, all of which are transitory, indicating that the medicine has initiated detoxification.

Other supplements to facilitate detoxification of xenoestrogens:

- Indole-3-Carbinol or Diindolylmethane (DIM), an active ingredient from cruciferous vegetables.

If the pre-existing load of copper is very high, and this is demonstrable on a Hair Tissue Mineral Analysis or Oligoscan test result, it may take many months to bring down that high load. At all times, the anxiety and depression cycle should be improving each month, otherwise the diagnosis, or the treatment, is incorrect.

At this stage of the treatment, I give copper chelate (sold in Australia by BioResearch: called CU Met; or available in homeopathic stock from Martin and Pleasance), a specially formulated potency chord of *Cuprum Metallicum,* combined with a zinc supplement, which will reduce the high copper in male and female patients. I give this medicine once every second day, sometimes in conjunction with the patient's indicated medicine based on totality of symptoms.

Zinc

Most of these patients will be zinc-deficient and it is important to give this supplement because it will aid in the chelation of copper (and xenoestrogens) as well as help to re-establish balance between the patient's oestrogen and progesterone cycle.

Advice to the patient

Susan will need no recommendation to stay away from the OCP. She already knows how it affects her body. Many women are not aware because they experience no clear side effects from the OCP; they do not associate their IBS symptoms with their use of the OCP. Women particularly sensitive to oestrogen excess may develop:

- Breast lumps
- Abdominal fat accumulation or overall weight gain which no amount of exercise can shift
- Other oestrogen-driven neoplastic cell growth
- Vaginal thrush
- Mood swings, particularly swinging from depression to anxiety depending on where they are in their menstrual cycle.

I encourage these women to seek alternative forms of contraception. For those who do not wish to go off the OCP for fear of pregnancy, or any other issue, it is vital they keep their zinc levels up, since the OCP will deplete zinc reserves over time, and they may need an annual prescription of *Folliculinum,* which can offset the side effects of the OCP without negating its contraceptive value.

What about patients with more serious side effects from xenoestrogens?

Some patients with cancer, undergoing conventional treatment, will want advice on ways to optimise their health and minimise the likelihood of their illness recurring.

Aside from cancer, patients with endocrine disturbance will want advice. Some of these patients might be:

- mothers whose daughters are going though precocious puberty (e.g., early puberty at age 8 or 9 years, and are showing signs of heavy periods and weight gain
- men with benign prostatic hypertrophy
- hypothyroid patients with a clear history of xenoestrogen accumulation.

For these patients we also use *Protocol 3,* a mixture of xenoestrogenic chemicals mentioned above (Protocol 3: Xenoestrogens 16c, 30c and 200c) made into a homeopathic potency. This mix has *Folliculinum*, mixed food grade plastics (containing BPA), phthalates, polychlorinated biphenol, parabens, etc. We give this in ascending potencies in what the patient understands is a 'detox protocol'. It generally produces symptom responses of a hormonal nature, which the patient understands as a 'detox'. The rationale is to use what is essentially tautopathy to remove these toxic substances. The works of practitioners such as the late Dr Tinus Smits[10] and Manfred Müller[11] provide further comment on the use of tautopathy to remove toxic substances from human tissue.

Patients should regularly check their zinc status as many will be deficient.

Common symptom expressions of copper toxicity:

- Anxiety and depression
- Fatigue
- Insomnia and night terrors
- Tics and restless limbs
- Seizures
- Brain fog
- Benign hypothyroidism
- Headaches worse at hormonal times of the month
- Exaggerated PMS
- Propensity to fungal, yeast infections
- Susceptibility to viral infections
- ADHD, Obsessive Compulsive Disorder and Asperger's Syndrome
- Migraines, especially hormonal
- IBS: nausea, flatulence, alternating constipation and diarrhea, as illustrated in Susan's case study.

Hypothyroidism

I have seen cases of hypothyroidism driven solely by copper excess. In the Oligoscan result panel shown here (Figure 1), one can easily see the copper excess and the zinc blockade. My only treatment was to prescribe a zinc supplement and giving copper chelate (sold in Australia under the brand BioResearch as 'Cu Met' drops), homeopathic drops for reducing the intracellular copper burden.

Other elements to consider in hypothyroidism:

- Iodine deficiency
- Selenium deficiency
- Sequelae from an acute viral infection

Beware the zinc blockade

The Hair Tissue Mineral Analyses (HTMA) in the case studies below demonstrate a typical high copper excretion via hair in cases clinically affected by high copper. In patients who are 'poor excreters', an initial HTMA can understate the true amount of toxic copper excess. After a course of treatment, which includes detoxification, the true burden of high copper is then excreted and seen on a subsequent HTMA.

Mineral Test Report

		Result	Normal	
Calcium	(Ca)	513.6	279.0	598.0
Magnesium	(Mg)	29.5	30.5	75.7
Phosphorus	(P)	183.1	144.0	199.0
Silicon	(Si)	11.4	15.0	31.0
Sodium	(Na)	78.7	21.0	89.0
Potassium	(K)	39.8	9.0	39.0
Copper	(Cu)	36.8	11.0	28.0
Zinc	(Zn)	210.0	125.0	155.0
Iron	(Fe)	11.7	5.0	15.0
Manganese	(Mn)	0.60	0.31	0.75
Chromium	(Cr)	1.20	0.82	1.25
Vanadium	(V)	0.032	0.009	0.083
Boron	(B)	1.87	0.84	2.87
Cobalt	(Co)	0.038	0.025	0.045
Molybdenum	(Mo)	0.050	0.035	0.085
Iodine	(I)	0.42	0.32	0.59
Lithium	(Li)	0.048	0.052	0.120
Germanium	(Ge)	0.017	0.003	0.028
Selenium	(Se)	1.69	0.95	1.77
Sulphur	(S)	51.2	48.1	52.0

Low- Low Normal OK Normal+ High High+

Figure 1. Oligoscan showing a zinc blockade

Zinc and copper must be in balance. If the tissue accumulation of copper is greater than that of zinc, copper prevents the absorption and utilisation of zinc, resulting in what is seen on Oligoscan spectrophotometry as a 'zinc blockade' (Figure 1). The measurement used by Oligoscan is taken through the skin on the palm of the hand. A zinc blockade looks like excess zinc (and copper) on first inspection. However, the correct interpretation is that copper is displacing zinc out of organ tissue into the peripheral tissues. Zinc becomes concentrated in these peripheral tissues. This explains why zinc appears excessively high. This phenomenon is worse than plain zinc deficiency. These patients require daily zinc supplementation even though their zinc appears high. A daily supplement of zinc will force the peripheral zinc concentrations back into organ tissue, thereby displacing the dominant copper. Looking at the test result above, I gave this patient elemental zinc 50 mg/day, which resulted in the zinc line moving left, towards the normal zone, while the copper levels decreased.

It is useful to think of zinc and copper ratio as a seesaw. Zinc should always be the heavier, or dominant, element on the see-saw, with a ratio of approximately 2:1.[12]

Trans-generational copper toxicity

It is common for a copper burden to be seen across the genetic line. Figure 2 shows three generations of a family whose members exhibited high copper when tested. Two male cousins, both on the autism spectrum, inherited their copper burden from their mothers, who in turn inherited theirs from their own mothers. Each of these five family members, over three generations, had respective copper toxicity symptoms, requiring copper chelate, zinc and other remedies.

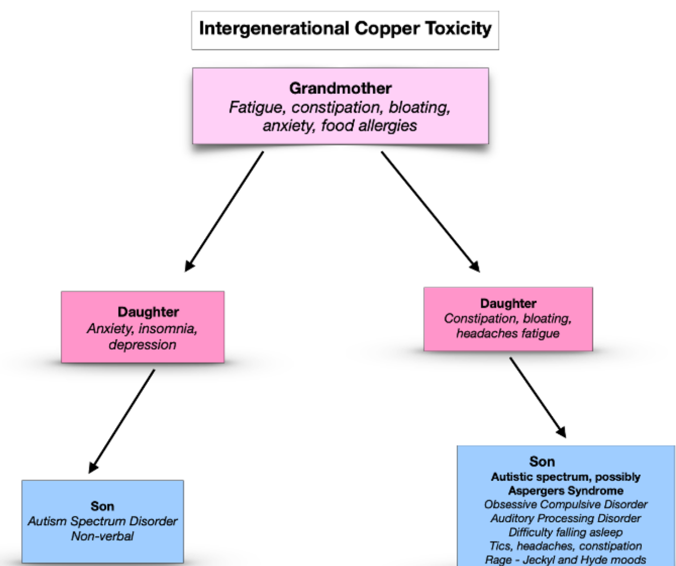

Figure 2. Example of intergenerational copper toxicity

Case Study 2: Epilepsy

Please note that in Australia one must be a medical practitioner to offer treatment for epilepsy, so I make no claims in relation to treatment of this disease.

Freddy: male, age 2

This child had daily multiple focal seizures. Although he had been prescribed *Phenobarbitone*, *Phenytoin*, and *Keppra,* the medications were only partly effective. Freddy was in a critical condition. His Oligoscan showed a copper overload (Figure 3). This is one of the cases of genetically acquired copper excess: copper symptoms can be seen on the father's side of the family, although there is no family history of epilepsy.

I gave this little boy homeopathic *Cuprum met 6c*. Metallic copper is a homeopathic remedy used in India, among other countries, to treat epilepsy. The remedy has the added effect of reducing the copper burden. All seizures stopped on this remedy. Over the ensuing 2 years all the prescribed medications were slowly withdrawn. Freddy's mother wanted to keep her son on this homeopathic remedy indefinitely as a preventative treatment; her big fear was that the seizures would return if we withdrew the remedy. To this day, 5 years at the time of writing, each day she gives her son a dose of the remedy, and each day there are no seizures.

An important comment about the homeopathic dose

Many practitioners are cautious about prescribing a long-term homeopathic remedy indefinitely, because of the idea that the patient will start to 'prove' the remedy, that is, start to manifest iatrogenic symptoms (i.e., caused by a medicine) from continually using the remedy. I can confidently state that when you have a malignant pathology, such as potential status epilepticus, you must give the homeopathic remedy frequently and not withdraw it at all while the patient remains stable. We do not fully know the malignant causes which might underpin this disease, but we can see that the homeopathic remedy is holding it at bay. The danger to the patient is not continued use of the remedy, but withdrawing or changing the dose while the patient is stable. I make this point very clearly in relation to malignant pathologies of any kind. We can never use the 'cure' word in relation to these pathologies, because we do not know if the pathology will return upon withdrawal of the remedy. If the patient needs to take the remedy every day for the rest of their life, and I have many patients in this situation, that is the best outcome.

For non-malignant disease, with functional disturbance but no pathology, it is appropriate to slowly change or

withdraw the homeopathic remedy once the patient has achieved a significant level of improvement

Jill: 39-year-old woman with epilepsy

Seizures occurred each month at the close of menstruation. Symptoms:

- loss of control of head, arms, with weakness
- falling
- inability to speak
- tremor.

At other times she felt dizzy, unable to properly balance, with tingles in the head, feeling as though her eyes are moving on their own.

Jill experienced headaches, obsessive thoughts and anxiety, which were worse at ovulation and menses. There was ovarian pain at ovulation, and the above symptoms continued until she had finished her menstruation cycle; therefore, two weeks out of four she felt unwell.

Her Oligoscan showed a relative copper excess in relation to zinc deficiency (Figure 4). This means her zinc was too low in relation to her copper level: if her zinc level was where it should be, her copper would clearly be in excess on the test page. This was confirmed by the fact that Jill's serum copper was also elevated.

There is a specific homeopathic remedy which covers seizures which occur at menstruation, called Bufo. In addition, because of Jill's high copper, and because homeopathic copper is an anti-seizure remedy, I prescribed:

- *Bufo 200c* - 1 dose every 4 days
- *Cuprum met 6c* - 1 dose daily
- Zinc 50mg/day
- *Greater Celandine*, 5 drops 3 x daily.

The addition of herbal extract Greater Celandine cleared the biliary tree, allowing detoxification. These remedies were successful. No more seizures were noted. Jill reported improvement in anxiety and obsessive thinking, no headaches or nausea, and improvement in her hormonal symptoms.

After 6 months there was a small relapse of cluster seizures, occurring twice over a month, with no seizure activity in between. At this time I reviewed the prescription, changing Bufo to a new remedy, *Absinthium 6c*. Since that time there has been no further seizure activity.

Mineral Test Report

Mineral		Result	Normal		Low-	Low	Normal	OK	Normal+	High	High+
Calcium	Ca	420.7	279.0	598.0							
Magnesium	Mg	30.7	30.5	75.7							
Phosphorus	P	175.6	144.0	199.0							
Silicon	Si	10.1	15.0	31.0							
Sodium	Na	66.8	21.0	89.0							
Potassium	K	33.5	9.0	39.0							
Copper	Cu	29.4	11.0	28.0							
Zinc	Zn	149.1	125.0	155.0							
Iron	Fe	13.3	5.0	15.0							
Manganese	Mn	0.43	0.31	0.75							
Chromium	Cr	0.95	0.82	1.25							
Vanadium	V	0.031	0.009	0.083							
Boron	B	1.96	0.84	2.87							
Cobalt	Co	0.038	0.025	0.045							
Molybdenum	Mo	0.052	0.035	0.085							
Iodine	I	0.33	0.32	0.59							
Lithium	Li	0.049	0.052	0.120							
Germanium	Ge	0.018	0.003	0.028							
Selenium	Se	1.53	0.95	1.77							
Sulphur	S	51.2	48.1	52.0							

Figure 3. Freddy's Oligoscan results showing copper overload

Mineral Test Report

Mineral		Result	Normal		Low-	Low	Normal	OK	Normal+	High	High+
Calcium	Ca	470.2	279.0	598.0							
Magnesium	Mg	36.5	30.5	75.7							
Phosphorus	P	161.3	144.0	199.0							
Silicon	Si	11.4	15.0	31.0							
Sodium	Na	65.4	21.0	89.0							
Potassium	K	17.6	9.0	39.0							
Copper	Cu	10.3	11.0	28.0							
Zinc	Zn	105.2	125.0	155.0							
Iron	Fe	8.4	5.0	15.0							
Manganese	Mn	0.39	0.31	0.75							
Chromium	Cr	0.76	0.82	1.25							
Vanadium	V	0.022	0.009	0.083							
Boron	B	2.02	0.84	2.87							
Cobalt	Co	0.027	0.025	0.045							
Molybdenum	Mo	0.034	0.035	0.085							
Iodine	I	0.49	0.32	0.59							
Lithium	Li	0.068	0.052	0.120							
Germanium	Ge	0.021	0.003	0.028							
Selenium	Se	1.88	0.95	1.77							
Sulphur	S	48.3	48.1	52.0							

Figure 4. Jill's Oligoscan result showing low zinc in relation to copper

Summary of the effects of copper toxicity

- Neurological
- Cognitive
- Hormonal
- Mood
- Gastrointestinal
- Immunological

Jon Gamble, a naturopath and homeopath, has been in full time practice since 1987. He is an educator and author of numerous books. This article is extracted from Mastering Chronic Disease: Toxicity, Deficiency and Infection, Karuna Publishing, 2021: ***www.karunapublishing.com.au***

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Kinesiology and transgenerational emotional traumas, *and epigenetic influences on emotional well-being*

Angela Scriberras

Abstract

This study delves into transgenerational emotional trauma, employing kinesiology to dissect the interplay between epigenetic influences and emotional well-being. The investigation is anchored in a case study that centres on a 9-month-old infant displaying pronounced aversion to food, with a plausible correlation traced back to the mother's traumatic experiences during mealtimes as a child. The study integrates muscle testing and emotional release techniques to target and alleviate negative emotional imprints originating from ancestral issues related to food. By elucidating the intricate tapestry of transgenerational trauma and epigenetic transformations, this case study not only lays the groundwork for future exploration at the nexus of kinesiology and emotional well-being shaped by hereditary experiences but also demonstrates the potential of surrogate muscle testing to yield efficacious outcomes.

Kinesiology, a modality steeped in the realm of energy equilibrium and muscle testing, has emerged as a prospective therapeutic avenue across diverse health spectrums. This study explores transgenerational emotional trauma, probing the credibility of inherited emotional impressions fostering a subject's emotional response to specific triggers. The central focus is a case of a 9-month-old infant with an acute aversion to food, a disposition that I postulate could be anchored in her mother's traumatic mealtime experiences during her own formative years. In this article I have synthesised kinesiology techniques and epigenetic influences to illuminate the potential influence of inherited emotional experiences on emotional well-being across generations.

Supporting Literature

Psychology, psychiatry, and epigenetics have witnessed a confluence of investigations into the vicissitudes of transgenerational trauma and its cascading impacts on gene expression. For example, Yehuda et al. (2016) investigated methylation patterns in Holocaust survivors and their progeny, and found altered methylation patterns within the offspring, that could be seen as a testament to the lingering effects of parental trauma on the progeny's stress-response systems.(1) Franklin et al. (2010) found distinct DNA methylation patterns triggered by early-life traumatic stress in rats, which cascaded to influence subsequent

generations' behaviour, even in the absence of direct stress exposure.(2) Similarly, Radke et al. (2011) found the epigenetic implications of intimate partner violence during pregnancy on their adolescent children via DNA methylation in the glucocorticoid receptor gene promoter.(3) Additional studies cast light upon the transgenerational propagation of stress and emotional experiences. Bohacek and Mansuy (2015) examined the transgenerational inheritance of acquired behavioural traits in mice, revealing behavioural shifts persisting over generations without direct exposure to stressors.(4)

Methodology

In this case study, the infant's mother acted as a surrogate for muscle testing, due to the infant's inability to undergo direct testing. Though the infant remained untested, the outcomes following treatment invite reflection on the session's efficacy. An array of muscle tests were conducted to traverse historical data and maternal experiences until an indicator was found. The mother's emotional experiences with food in her childhood were exhaustively explored to find triggers that potentially contributed to the infant's food aversion.

In this case study, muscle testing set out to identify and mitigate negative emotional charges stemming from ancestral inheritance, which might potentially catalyse the release of emotional anchors linked to past traumas. The paramount aim was to foster emotional healing and attenuate the infant's aversion to food.

Results

The application of muscle testing revealed an emotional connection denoted as 'Emotional in the Context of Generational,' coupled with a link to 'Father.' Further exploration revealed intricate ties between 'food' and 'father.' It is important to note that these revelations were associated with the mother's experiences, and not the infant's.

The mother's narrative revealed an emotionally-charged background - a history of traumatic mealtimes during her childhood. Her father imposed unreasonably large portions, with violent reactions if they were not eaten. To prevent these episodes and protect her children, their mother would stealthily hide food. These experiences, etched into the subject's memory from early childhood until her mother's departure when she was nine year's old, sowed the seeds of emotional turmoil - 'Forced,' 'Stress,' 'Fear,' 'Trauma.'

Transitioning to her teen years, deeper testing found the mother's steadfast opposition to being 'forced to eat.' This defiance, forged by traumatic encounters with her father, persisted, prompting her to reject meals even when hungry. This entrenched opposition crystallised into convictions of 'I will not be forced' and 'I will never force anyone else to eat.' This narrative remained resolute, infusing her identity with resilience against imposition.

Further exploration of the mother's final weeks of pregnancy revealed a pivotal episode: placental insufficiency precipitated an emergency induction due to inadequate nutrient and oxygen transfer. This incident may have strengthened her deeply emotional resolve against both using and being subjected to force. From the moment the infant was born she displayed an absence of hunger or interest in food, and the very notion of coaxing her into eating roused indignation in the mother, an expression of her own profound resistance to coercion.

Muscle testing illuminated inherited influences—the father's lineage was marred by severe poverty, fostering notions of 'scarcity' necessitating excessive consumption for survival. In parallel, was the maternal grandmother's depression stemming from the loss of a child, ingrained an aversion to 'forcing' anything.

A revelation surfaced—her own mother, scarred by the loss of a child, harboured guilt, and adverse feelings toward imposing anything. This intricate emotional legacy combined food, trauma, and abusive relationships. Amplifying this, her mother's history of abuse forged a relationship with food characterised by secrecy and hoarding.

Transitioning to the period following the infant's birth, the mother recounted the absence of breast milk, necessitating bottle and formula feeding—a scenario possibly reinforcing her resistance against 'forcing' anything.

Collectively, these revelations sketched a vivid tableau of the mother's traumas and emotional imprints that potentially permeated the infant's relationship with food. This intricate tapestry of inherited emotional experiences from both parents set the stage for subsequent analysis and intervention.

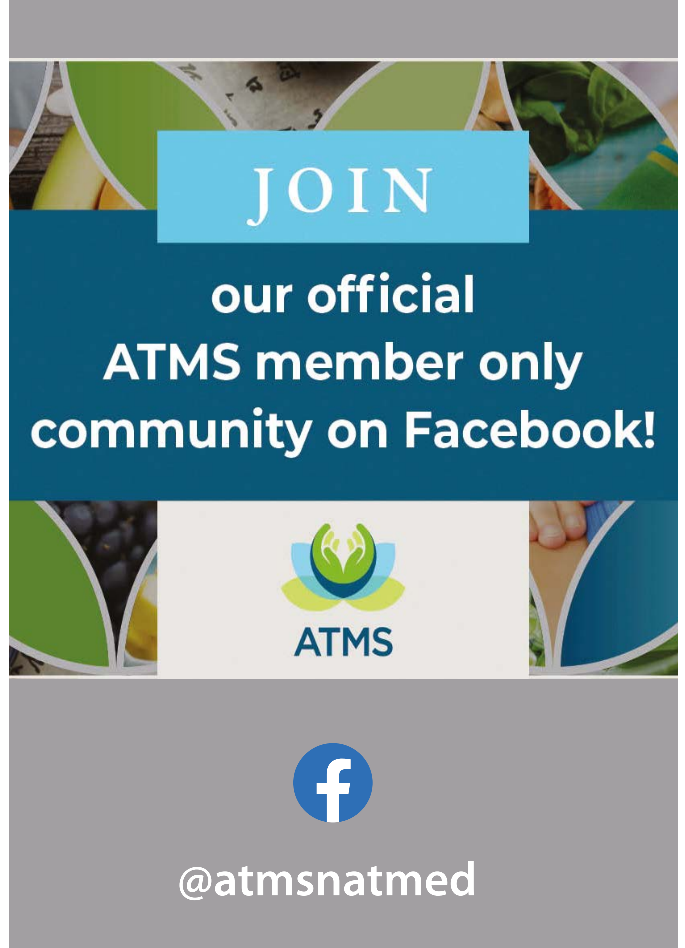
After a 2-week period, feedback was received from the mother saying, “You are honestly a miracle worker. The baby has been completely different towards food since the session! It is amazing! I honestly cannot thank you enough!” This outcome seems to suggest the intriguing terrain of transgenerational emotional trauma, perhaps shedding light on the potential influence of inherited emotional imprints on emotional well-being, in this case explored through the lens of kinesiology techniques. Research in epigenetics and transgenerational trauma underscores the proposition that emotional experiences have the potential to cascade across generations. With such positive results in just a single 1-hour session, further research is needed to understand kinesiology and its potential as a safe, non-invasive tool for both adults and children.

The case study's significance is its potential insights into the multifaceted interplay of inherited emotional imprints and their ramifications for an individual's emotional response to

specific triggers. Based on maternal feedback, the case study offers support for kinesiology's role in emotional well-being shaped by transgenerational experiences.

Furthermore, it is important to acknowledge that over the course of my 19 years of practice, such results are not isolated anomalies but consistently replicated. However, it's also important to acknowledge the challenges of research into natural therapies like kinesiology, where the process, information, triggers, and treatment methodologies are inherently unique, tailored to individual histories and experiences.

This case study, though a preliminary exploration, suggest a role for kinesiology in ameliorating food aversion and indifference in infants through the prism of emotional generational feedback and inherited imprints. This study suggests kinesiology's role in accounting for emotional factors within therapeutic interventions. Further research including randomised controlled trials with broader sample sizes and control groups are needed to establish conclusions.



COLLECTIVELY, THESE REVELATIONS SKETCHED A VIVID TABLEAU OF THE MOTHER'S TRAUMAS AND EMOTIONAL IMPRINTS THAT POTENTIALLY PERMEATED THE INFANT'S RELATIONSHIP WITH FOOD. THIS INTRICATE TAPESTRY OF INHERITED EMOTIONAL EXPERIENCES FROM BOTH PARENTS SET THE STAGE FOR SUBSEQUENT ANALYSIS AND INTERVENTION.

Summary

The interplay between scientific inquiry and the metaphysical realm, often labelled as 'woo,' is an intricate landscape. Kinesiology is part of this ongoing discourse between alternative therapies and evidence-based medicine. Demystifying kinesiology and unravelling its potential benefits requires future exploration.

Acknowledgments

I am sincerely gratitude to the participants who contributed to this case study, enhancing our comprehension of the connection between kinesiology and emotional well-being.

The author, Angela Sciberras, a certified kinesiologist, conducted the research detailed in this paper. *The viewpoints articulated herein are exclusively those of the author and do not necessarily align with the perspectives of the ATMS journal or its affiliates. The research presented is intended for academic and educational contexts and does not constitute medical advice or recommendations.*

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Shiatsu is an immersive, all-encompassing experience that can instil a sense of grounding and presence and take us deep into the essence of our physical beings. Accepting this invitation

The Journal of the Australian Traditional-Medicine Society (JATMS) welcomes submissions to a special-themed issue on natural medicine approaches to mental health.

Mental health is essential for our overall health and wellbeing.[1] The term 'mental illness' covers a range of conditions including anxiety disorders, affective disorders, psychotic disorders and substance use disorders. It is estimated that 1 in 5 (21%) of Australians aged between 16 and 85 years experienced a mental health disorder in the past year.[2] A survey of people who had used natural medicine over the past year found that 21.3% met diagnostic criteria for one or more mental disorders.[3]

The Journal welcomes submissions describing natural medicine approaches to mental health. These can include articles based on clinical experience, case studies, literature reviews, and articles of original research.

Submissions due: 15 October, 2023

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Unleashing Wellness: *Shiatsu and the Healing Power of Therapeutic Touch*

Jason Chong | BHSc (Chinese Medicine), Diplomate of Canonical Chinese Medicine, Diploma of Shiatsu and Oriental Therapies, Diploma of Traditional Chinese Medicine Remedial Massage (An Mo Tui Na)

Abstract

This article explores the healing power of Shiatsu massage and therapeutic touch. It argues that in our modern, isolated world, practices like Shiatsu help dismantle barriers and foster meaningful human connections. Shiatsu derives from traditional Japanese massage and incorporates principles of Traditional East Asian Medicine. It focuses on the flow of vital energy or Ki in the body. Gentle pressure and movement in Shiatsu aim to restore this energy balance. The article examines the multidimensional benefits of touch. On a neuroscientific level, touch activates brain regions that regulate physiological processes and the nervous system. Psychologically, touch enhances wellbeing, childhood development, and relationships by triggering positive emotions and hormone release. The context of touch affects individual perceptions and outcomes. The article emphasizes touch as an antidote to disconnection, making it vital for practitioners to provide in the post-pandemic era. Shiatsu promotes holistic wellness by reconnecting us to our physical, emotional, and spiritual essence through therapeutic touch. It reminds us that we are part of a larger whole. Shiatsu's blend of Eastern medicine and therapeutic touch enhances its healing abilities. It can ease conditions like chronic pain and boost immunity while reducing stress and anxiety. The simplicity of touch underscores empathy and human connection in healing. Incorporating Shiatsu in our lives can involve receiving professional treatment and practising self-Shiatsu. Mindfulness of touch in daily activities is encouraged. Shiatsu therapy promotes overall wellness beyond symptom treatment.

Introduction

Today, we live in a world where rules of engagement have shifted. During COVID-19 restrictions physical distance became our shield, with a distance of 6-feet mandated between each other. Clear plastic barriers separated us, masks hid our emotions, and throat clearing made us nervous. Now we observe that the effects of these responses continue to linger as we move onwards from the height of pandemic anxiety.

It is within this climate of separation that the true importance of therapeutic touch and practices like Shiatsu come to light. This deeply intimate, almost spiritual, practice aims to dismantle those artificially imposed barriers.

Amid the isolation that we experience in the modern world, this is a way for us to create a deeper and more meaningful human connection. By doing so, we can cultivate intimacy and forge a pathway that counters the prevailing isolation. This pathway can lead to the fulfilling and profound human connection that we have been longing for.

But why is touch so therapeutic? It's simple. Touch is our first language. Long before we can see, speak or understand, we communicate and connect through touch. It is a primal, essential part of our existence. And when used therapeutically, it can work wonders to reconnect us with

our somatic sensations and the rhythms of nature that surround us.

In the bustling, fast-paced, post–pandemic world, balance is askew, connection has become less of a priority and wellness often takes a backseat. Yet it is more important than ever that we understand the fundamental necessity of therapeutic touch and bring it into our daily lives.

The multidimensional impact of touch: A neuroscientific perspective

Touch affects our bodies and nervous systems, especially the vagus nerve. Touch can regulate physiological processes, including blood pressure, heart rate, and cortisol levels.

The nervous system plays a big role in the benefits of touch. Touch stimulates sensory neurons in the skin and signals the spinal cord. This interaction can activate brain regions like the insula, orbitofrontal cortex, and anterior cingulate cortex. The act of touch can trigger memory formation and positive hormone release.[1]

Touch has a calming effect on the nervous system by reducing brain waves and heart rate.[1] It triggers the vagus nerve, activating the parasympathetic state, leading to a slower heart rate and lower blood pressure. This induces a calming, relaxation response in the body, reducing stress and anxiety.

However, the perception and impact of touch can vary depending on the context and the individual's sensitivity to it. In situations perceived as threatening, touch may elicit the fight-or-flight response. [3] In the same way, children who are sensitive to sensory stimuli may perceive touch as painful, leading to a threat response in their nervous system. Because context and individual sensitivities can significantly mediate diverse outcomes, as bodywork therapists we must consider our approach to touch and the context in which we provide it to ensure a positive response.

Photo by Anna Schvets

The pervasive influence of touch: Psychological wellbeing, childhood development and relationship building

Psychological wellbeing, childhood development, and relationships are all affected by touch. It can shape individual emotions, behaviours, growth, and perceptions of interpersonal interactions. Touch can make people feel secure, calm, and connected. We have said that touch eases stress and anxiety [2] and it also diminishes perceptions of loneliness. [4]

In the realm of childhood development, touch is a vital lifeline. Infants deprived of touch can fail to thrive and even experience weight loss.[5] Holding your baby skin-to-skin after birth helps regulate their temperature, heart rate, breathing, and reduces crying.[6]

Touch is also integral to brain development, and it is understood to accelerate a child's development. Physical contact aids children in comprehending themselves and the world around them. Notably, physical connection serves as a primary method of communicating with infants. Touch can not only affect development during childhood but also has long-term effects.

Touching, such as hugging, releases oxytocin, also known as the "love hormone", which strengthens relationships. Touching deepens emotional bonds and leads to happier relationships. Touch can build trust and cooperation. Even a brief touch with a stranger can have a positive effect.

The holistic impact of Shiatsu: Traditional techniques, modern wellness

In the heart of Japan, centuries ago, a unique form of bodywork was born. It was called Shiatsu, a practice that would eventually traverse oceans and continents, bringing its healing touch to the world. Shiatsu, as we know it today, is a product of both traditional Japanese massage techniques and modern Western therapies. It is a beautiful blend of the old and the new, the East and the West. But at its core, Shiatsu is deeply rooted in the principles of Traditional East Asian Medicine (TEAM) and the concept of Ki or Qi.

Ki, in the simplest terms, is life energy. It is the force that animates us, the vital energy that flows through our bodies. In a state of health, Ki flows freely, maintaining balance and harmony. A disruption in the flow of Ki can cause physical, emotional, and mental health issues. Shiatsu, with its gentle pressure and rhythmic movements, works to restore this balance, to get the Ki flowing again.

Shiatsu is an immersive, all-encompassing experience that can instil a sense of grounding and presence and take us deep into the essence of our physical beings. Accepting this invitation can help us connect with our bodies, listen to its cues. It also encourages us to establish a deeper connection not only with ourselves but with our surroundings. This connection can help us recognise we are integral parts of a larger whole, individual notes in a universal symphony, inextricable threads in an intricate tapestry.

Shiatsu and therapeutic touch: A powerful combination

The beauty of Shiatsu is its seamless blend of Eastern medicine and therapeutic touch. The synergy of both practices enhances their healing abilities for holistic wellness. The practice of Shiatsu is about re-establishing, strengthening, and nurturing the connection with our body, our mind, and our spirit. It is about understanding the delicate interplay between these elements, and working to restore balance when one of them is out of sync. In Shiatsu the practitioner's hands become an extension of their intuition and wisdom, guided by the subtle cues of the body. Each press, each hold, each stretch is a step towards restoring balance and harmony.

The benefits of this combination are manifold. On a physical level, Shiatsu is thought to help ease a range of conditions, from chronic pain to digestive issues to sleep disorders. It is thought to boost the immune system, improve circulation, and promote relaxation. Practitioners use the wisdom of East Asian Medicine to help clients with fertility and digestion issues.

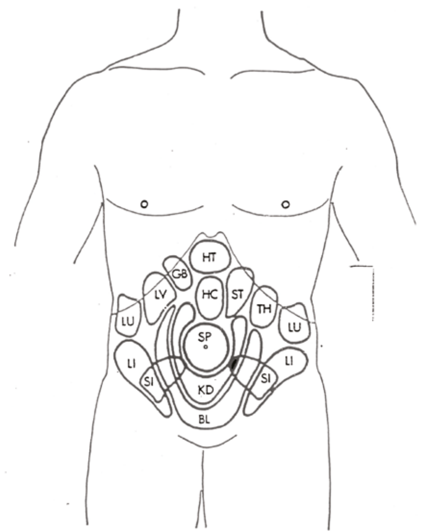
On a psychological level, by addressing the flow of Ki, Shiatsu may also help ease emotional and mental health issues. It may help reduce stress, alleviate anxiety, and promote a sense of wellbeing. It is a holistic approach that treats the person, not just a collection of symptoms.

There's something beautiful in the simplicity and accessibility of Shiatsu massage. This therapy provides human-to-human interaction that is scarce in our modern world. With Shiatsu, you can experience the power of touch and genuine connection with another person. It is a powerful reminder that even in this age of technology, we still crave meaningful interactions with others. Therapeutic touch is the antidote to the distancing forces that keep us feeling disconnected and isolated.

In our stressful world, Shiatsu can provide a moment of peace. It encourages you to slow down, to find your own tempo, to dance to your own rhythms, and to find balance and harmony with your modern existence. In a clinical setting Shiatsu can be used to focus on a wide range of human experiences.

How to incorporate Shiatsu and therapeutic touch into your clients' lives

The journey towards wellness is personal, unique to each individual. But regardless of where an individual is on this journey, Shiatsu and therapeutic touch can be valuable companions. Here's how your clients can incorporate these healing practices into their lives. Shiatsu need not be confined to the practitioner's office. With some basic knowledge and techniques, your clients can practice self-Shiatsu at home.



Self Ampuku (Hara / abdomen) Shiatsu therapy is a simple self-Shiatsu practice that we can guide our clients in. Clockwise abdominal palpation can diagnose organ imbalances in Shiatsu. To engage in this, have your clients begin with light palpation at the upper part of the abdomen (12 o'clock), associated with the Heart. They should associate each touch with a deep in-breath upon contact and out-breath upon release. Then, moving clockwise around the outside of the abdomen, they palpate the areas associated with the Triple Warmer, Stomach, Lungs, Large and Small Intestine and Bladder to reach 6 o'clock. Continuing onwards, they pass through the Intestines and Lungs again into the area of the Liver and Gallbladder before returning to the Heart once more. They can then palpate down through the midline to pass through the Pericardium, Spleen and ultimately Kidney (the root of our energy).

By focusing on any discomforts uncovered in these procedures, we can learn more about our bodies. By bringing therapeutic self-touch to these areas, we

can resolve imbalances in our bodies. We can then engage in a second and third circuit, each time palpating a little deeper. This routine daily not only helps us self-diagnose but also self-treat the complex network that makes our inner being.

We can incorporate therapeutic touch in various ways besides Shiatsu treatments. It could be as simple as giving a loved one a comforting hug or a gentle massage. We can practise mindfulness in touch by noticing textures and sensations in everyday activities.

Remember, the goal is not just to treat symptoms, but to promote overall wellness. It is about listening to your body, understanding its signals, and responding with care and compassion. It is about nurturing, not just your physical health, but your emotional and mental wellbeing as well.

Closing at the Hara

Our exploration of Shiatsu reveals that it provides more than just physical relief. It can offer a path to holistic wellness, a journey that encompasses the body, mind, and spirit. Shiatsu, with its roots in ancient Eastern philosophy and its focus on the flow of Ki, offers a unique perspective on health and healing. It reminds us we are more than just physical beings, that our emotions, our thoughts, and our energy all play a crucial role in our wellbeing.

Therapeutic touch, in its simplicity and universality, underscores the power of human connection. It reminds us that healing is not just about treating symptoms, but about nurturing the whole person. It is about empathy, care, and connection. Its simplicity makes it stand out, and it speaks to the very core of our humanity. You can do it without a difficult supply chain, extensive corporate structure, or high-tech tools. Shiatsu and therapeutic touch only need the hands of a skilled and caring practitioner. This is a craft that no Artificial Intelligence or Robot can replace.

As bodywork therapists, we all have an amazing gift to provide to our clients in the post-pandemic space. We can provide connection, healing and support while dissolving the barriers that can keep us isolated. By leading our clients back to reconnection through touch, we can truly be the imperial fire that guides our communities to restoring wholeness. This is more important now than ever before.

Dantian Health's East Asian Medicine physician, Jason Chong, also serves as the Director at the Australian Shiatsu College. His areas of expertise include acupuncture, Chinese herbal medicine, Tuina, and Shiatsu. His life's work revolves around guiding individuals to rediscover their health by both treating and educating them in the principles of East Asian medicine.

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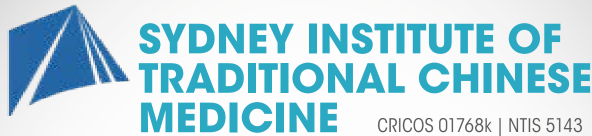

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Contract law: *Do you know what makes a contract?*

Ingrid Pagura | BA, LLB

A new financial year is often a time to review existing contracts and enter into new ones. It has been a while since I reviewed the elements of a contract, so before making a change, read this article to refresh your memory. Contracts underpin most things in our business but many of us don't really take the time to think about what a contract is and how it binds us.

So, first, what is a contract? It is defined as a bargain which parties intend to be legally binding, or which they would have meant to be so, had they stopped to think about it.

Contracts are part of everyday life. In a health setting, there are many contracts such as consultations with clients, contracts to rent space, employment contracts and insurance, to name a few. For example, clients enter into a contract with the Massage Therapy Clinic when they book in for a massage. By definition, they are considered to be consumers and so consumer law applies to them. This is the same for all health care practitioners.

To prove a contract exists we must prove three things: agreement, consideration, and intention to enter legal relations.

Agreement

An agreement will only exist if there is a definite offer by one person to undertake a commitment and an unconditional acceptance of that offer. The contract is formed at the moment the offer is accepted and then both parties are bound. There are some rules relating to agreements.

First, to enter into a contract a person must be an adult and of sound mind. There are special rules relating to minors (under 18 years) and people with intellectual disabilities.

Second, there must be identifiable parties to the agreement, that is, one party must make the offer and the other must accept it. Either party need not be named as long as they can be pointed to.

Finally, terms must be sufficiently certain for an agreement to be formed. Terms are promises made by the agreement and the details included. For example, if you are buying a car, you would need to have finalised the price, the car, date of delivery etc. If you are seeing a herbalist you would need to have sorted out the price of the consultation and its length. There may still be a few things to iron out, but the bulk of the agreement must be certain.

Consideration

The next to be proven is consideration. This is a legal term and has nothing to do with considering the other person's feelings. It means that each party must be able to point to the obligations undertaken by the other. There must be give and take on both sides. There must be an exchange. Consideration means that each party should be able to identify what they need to do and what the other party needs to do to fulfil the terms of the agreement. For example, if goods are supplied they must be paid for, and the same applies to a service, like a massage: if it has been provided you are required to pay for it. The price does not legally need to be in proportion to the service provided, but real value has to be given.

Consideration also includes barter agreements, where people swap services or goods. If an acupuncturist gives a person a session in return for their bookkeeping, then this would be a consideration, as each person can point to fulfilment of their obligations.

Gifts or free items do not have consideration as there is no exchange. This means that gifts and free items are not contracts and so not subject to consumer law. For naturopaths, for example, consideration exists when a person pays for the consultation they have received. Rather than give away free sessions, consider discounting as a way of giving the client a benefit but still being covered by consumer law.

Intention

Intending the contract to be binding is the third element though is not usually stated, but rather is implied. It is often inferred from the circumstances surrounding the agreement. Some things that may go towards proving this point are:

- That the agreement is in writing: although there is no requirement, it is advisable to put all contracts in writing, so as to help clarify what promises were made and that it was meant to be binding. In contract law there are only a few contracts that must be in a particular form, such as those for selling property, otherwise there is no requirement as to form. A contract can be as simple as outlining who are the parties, what is the consideration and what is the penalty for not complying.

- That there is a signature: a signature on a contract can also be used to show that the parties intended it to be binding. Once a person signs a document, they state that they accept all the terms and that they are bound by them. If they have not read what they have signed, or understood it, they are still bound by it as it was their responsibility to do so. This is probably one of the most important points. YOU ARE BOUND BY THE CONTRACT. Many people think that if they simply change their mind they can get out of an agreement. Legally it does not work that way.

One of the best pieces of advice I can give you is to never sign any document without reading it first. Even if you think it is unimportant, you will still be bound by what you have signed. Remember, claiming that you didn't know what the contract was about or that you didn't read it, won't be a valid excuse for trying to get out of it.

Once a contract has been made, the terms cannot be changed unless both parties agree. Unless both parties are happy to vary the terms, they must continue as agreed and they have an obligation to carry out their part of the bargain. It is a good idea to think about how a contract will work for you before agreeing to it.

Most terms of the contract will set out information relating to what the contract is about, but there are other terms that are more complicated.

- Termination clauses: these cover how the contract can be brought to an end by each party. There is often a notice period given, and in some circumstances a penalty may be incurred.

- Breach clauses: to breach a contract means that one of the parties has not carried out their part of the bargain. They have failed to fulfil their obligations (e.g., they bought a car, but they did not pay the remainder of the purchase price after the deposit). Most contracts include in their terms what happens if someone is in breach, and provide some sort of penalty.

- Exclusion clauses, waivers and disclaimers: many contracts have clauses which seek to limit liability in some way. They are often written in legal jargon and are difficult to understand, but usually state that a person won't be liable for certain things. These clauses are valid protection, provided that the person has not done something negligent. A person cannot sign away their rights at common law if there has been negligence.

Make sure that your client screening form includes an exclusion clause/waiver. It outlines to a client that they have a responsibility too, to be honest while you are screening them. It may also protect you from claims that have no basis in negligence. These clauses often make a person think twice before launching into frivolous legal action, but remember no clause is 100% effective. No exclusion clause will protect you if you've been negligent. We'll look more at this topic in upcoming articles.

Unfair Contract Terms

The Australian Consumer Law (ACL) includes provisions that address the use of unfair contract terms in standard form consumer contracts. This is done by removing unfair terms from standard consumer contracts. It does not apply to business-to-business contracts or insurance contracts.

A consumer contract is a contract for the supply of goods or services to an individual for personal, domestic or household use. A standard form contract is one that is prepared by the business, contains a set of generic terms and conditions, is negotiated between parties and is presented on a 'take it or leave it' basis.

A term is deemed unfair when the following three conditions are met:

- If the contract terms are one-sided and greatly favour the business over the consumer;
- There is no satisfactory commercial reason why the business needs such a term; and
- The consumer will suffer financial loss, inconvenience or other disadvantage if the term is enforced.

The ACL contains a list of some of the terms that might be considered unfair. You can still include these terms, but when used in certain circumstances they could be deemed unfair. Some examples are:

- Terms that allow the business to make unilateral changes to important aspects of the contract, such as increasing charges or varying the type of product to be supplied.
- Terms that avoid, limit or restrict liability of a supplier for a breach of the contract.
- Terms that require consumers who breach the contract or end it early to pay an excessive amount in compensation or cancellation fees.

So, take some time to review any new contract you are thinking about signing. It is also a good time to look over the contracts you currently use to see if they are valid and provide enough protection. If you don't have any, maybe now is the time to think about formalising your various agreements. Remember prevention is always better than cure!

PRACTITIONER PROFILE

Which modalities do you practise?
I am a practising naturopath, homeopath and remedial massage therapist.

How long have you been in practice?
I have been practising for over 25yrs on the Central Coast, NSW.

What have been the major influences on your career?
Major influences on my career have included moving away from naturopathy to more remedial massage since redoing my Remedial Massage Diploma in 2017 at SIBT and then working at Lakespa at Charmhaven with Maggie Sands and alongside other very skilled practitioners. This experience gave me confidence to start up my own Remedial Massage clinic.

What do you like about being a natural medicine practitioner?
The thing I love about being a natural medicine practitioner is being able to create a space for my clients to reconnect with themselves and align with their body to achieve their own natural healing. Being able to align and activate peoples vital force is such a rewarding gift and the best thing I love about being a natural medicine practitioner.

What advice would you give to a new practitioner starting out?
A lot of people would advise new practitioners starting out that the best way to achieve success is to specialise in what you do best and become known for treating a certain way or certain conditions. However I have found for me the greatest personal rewards have come from being a diverse practitioner, which has given me the privilege of meeting and treating a diverse range of people. I also would advise to always try to treat the whole of the patient. To quote Aristotle, "the whole is greater than the sum of its parts".

What are your future ambitions?
My future wishes are to be able to see natural medicine practitioners working collaboratively alongside other mainstream health practitioners. I hope to see natural therapy being more accessible and affordable to everyone , especially in rehabilitation clinics, mental health and cancer clinics through government programs and funding.

NOMINATIONS FOR THE ATMS NATURAL MEDICINE AWARDS ARE OPEN!

The Natural Medicine Awards are back in 2023, championing the natural medicine industry and acknowledging outstanding contributions made by clinics, practitioners and students.

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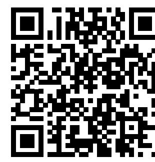

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OR, if you're a practitioner or clinic owner wanting to apply directly for your chance to be an ATMS Award Finalist or winner apply now!

Regulatory Update

Chantel Ryan

ATMS Board approves new Code of Conduct for Members

ATMS regularly reviews (and where applicable, updates) its policies, procedures and guidelines to ensure they reflect current industry standards and best practice for members. ATMS's Regulatory Committee recently reviewed and updated the Members' Code of Conduct to reflect changes in terminology and clarify certain practitioner requirements. The updated Code has been approved by the ATMS Board and will be available for Members soon. ATMS encourages Members to familiarise themselves with the new Code once available.

Some product manufacturers cease supply to new graduates of Advanced Diplomas

In August, several distributors including Bioconcepts, Metagenic and Integria announced they would require natural medicine practitioners to have a minimum qualification of a Bachelor degree in order to open a new account. While these rules don't affect those Advanced Diploma holders who already have accounts with these companies, new graduates of the current Advanced Diplomas in Naturopathy, Nutrition and Herbal Medicine will no longer be eligible. ATMS is disappointed by the stance taken by these companies, particularly considering that they plan to continue to supply to professionals in other modalities who have never studied nutrition or western herbal medicine.

While ATMS accepts these companies' decisions to amend their selling standards as they see fit, ATMS will continue to support the current Advanced Diplomas in Naturopathy, Nutrition and Herbal Medicine, provided they meet ATMS's education standards. ATMS conducts thorough internal reviews of both the colleges teaching these diplomas and their course material, via its Academic Review Committee, Board, and independent expert reviewers.

ATMS's decision to continue to accredit these courses was prompted by the increasing decline in the number of education providers of natural medicine in Australia – with only two education providers at this time teaching naturopathy, nutrition and herbal medicine. ATMS took this step to protect these modalities from complete removal from the education sector, as we have seen with other modalities, such as homeopathy. Graduates of ATMS accredited courses can also articulate into a higher education program with recognised prior learning.

ATMS has spoken with a number of product suppliers and encouraged them to conduct their own research into these courses, many of whom have agreed that these new Advanced Diplomas are of an adequate education standard. ATMS is pleased that many suppliers have announced they will continue to supply to graduates of these courses, provided the courses are accredited by natural medicine associations, such as ATMS. Discussions with suppliers are continuing and ATMS is hopeful that more suppliers will confirm their continued supply to all graduates of ATMS accredited natural medicine courses.

Natural Therapies Review Expert Advisory Panel (NTREAP) timetable for conclusion confirmed

In June, ATMS participated in a Health Department feedback session that confirmed that the Natural Therapies Review schedule was back under way with a process in place and a timetable for conclusion. The review is to consider further evidence for natural therapies to report to Government as to which therapies should have private health subsidies restored. The review was announced back in 2019 but suffered severe timetable disruption due to COVID. ATMS is pleased the review is again under way and will continue to support the completion of the review. It is expected that the report will be provided to government early 2024.

Vale Kevin Watkins

Kevin Watkins passed away on April 26, 2023, at the age of 70.
Kevin, a Remedial and Bowen Massage Practitioner, had a distinguished career in the practice and education of natural medicine. In 1992 he established a leading college of natural medicine, the South Australian Health Education Centre, and was its Managing Director until in 2008 Endeavour College purchased it. Kevin then became the manager of Endeavour's South Australian operation.

He was a long-serving, hard-working and highly valued director of ATMS, and a deeply committed and articulate advocate for the profession. After his term as a director he continued to serve ATMS through his participation in committee work.

Kevin also distinguished himself in other spheres of his very productive life. At various times he was a photographer for the National Geographic Society in several African countries and carried out project management for climate change in Uganda. He was the president of the Australian Surf Rowers' League and of Surf Life Saving South Australia, where his legacy is keenly felt.

ATMS extends its sincere condolences to Kevin's wife Sofie, and their children Oskar and Ella.

Acupuncture and TCM

Li Z, Feng J, Yin S, Chen X, Yang Q, Gao X, Che D, Zhou L, Yan H, Zhong Y, Zhu F. **Effects of acupuncture on mental health of migraine patients: a systematic review and meta-analysis.** BMC Complementary Medicine and Therapies. 2023; 23, Article number: 278.

Background: Migraine is a neurological disease characterized by moderate to severe headache and various neurological symptoms. It is often cause mood and anxiety disorders that can seriously affect quality of life. Acupuncture has been claimed to have a role in treating neuropsychiatric disorders and is becoming increasingly popular. However, it remains unclear whether current evidence is sufficient to support acupuncture in improving mental health in migraine patients.

Objectives: This systematic review and meta-analysis aimed to investigate the effect of acupuncture on the management of pain and mood disorders in patients with migraine.

Methods: We searched PubMed, Cochrane Library, Embase, Web of Science, Chinese National Knowledge Infrastructure (CNKI) and Wan Fang Data Knowledge Service Platform for reports, conferences and academic papers published before January 1, 2022. Randomized controlled trials (RCTs) including acupuncture, sham acupuncture and medication for migraine were included. Stata 16.0 software and Cochrane RoB2.0 were used for data processing and migration risk analysis.

Result: Thirteen randomized controlled trials containing 1766 migraine patients were included in the present study, the results showed that compared with sham acupuncture and medication, acupuncture seemed to have advantage in improving SAS (WMD: -5.64;95% CI: -10.89, -0.39; p = 0.035) and SDS (WMD: -4.65; 95% CI: -9.25, -0.05; p = 0.048) in migraine patients. And it seems to be more effective in improving MH (SMD: 0.77; 95% CI: 0.19, 1.35; p = 0.009), VAS (SMD: -1.06; 95% CI: -1.73, -0.4; p = 0.002;) and MSQ (WMD: 4.76; 95% CI: 2.36, 7.15; p < 0.001) than sham acupuncture and medication.

Conclusion: The present results suggest that, compared with Western medicine and sham acupuncture, acupuncture seems to be able to effectively improve anxiety and depression in migraine patients. And it may be more effective in improving SF36-mental health, VAS and MSQ than shame acupuncture or Western medicine. The results of this study need to be verified by higher quality RCTs.

Li Y, Yu G, Shi L, Zhao L, Wen Z, Kan B, Jian X. **Multiorgan failure caused by Chinese herbal medicine Xanthii Fructus poisoning: A case report.** BMC Complementary Medicine and Therapies. 2023; 23, Article number: 273

Background: Xanthii Fructus was used in the treatment of rhinitis and related nasal disease. It is the most commonly used chemically active component in compounds formulated for the treatment of rhinitis. However, poisoning, resulting in serious consequences, can easily occur owing to cocklebur overdose, improper processing, or usage without processing.

Case presentation: We reported on a 55-year-old man who experienced allergic rhinitis for 2.5 years. He ingested unprocessed Xanthii Fructus for 2 months as treatment. However, he developed anorexia; nausea; abdominal pain; general weakness; hiccups; oliguria and anuria; significantly elevated serum alanine aminotransferase, aspartate aminotransferase, and creatinine levels; and abnormalities in blood coagulation series. Nutritional support; daily drugs for liver protection, gastric protection, inflammation reduction; fresh plasma; and cryoprecipitate infusion were administered. Continuous venovenous hemodialysis (Prismaflex ST100) was also administered. However, the patient's multiple organ failure gradually worsened, ultimately leading to death.

Conclusion: Xanthii Fructus poisoning affects multiple systems, and its clinical manifestations are complex. Therefore, it is easily misdiagnosed and missed. Along with careful inquiry of medical and medication history, early diagnosis and intervention are vital for a successful treatment. It is also important to educate people and create awareness about this poisoning. Therefore, this intractable case has great clinical significance.

Aromatherapy

Eid AM, Jaradat N, Shraim N, Hawash M, Issa L, Shakhsher M, Nawahda N, Hanbali A, Barahmeh N, Taha B, Mousa A. **Assessment of anticancer, antimicrobial, antidiabetic, anti-obesity and antioxidant activity of Ocimum Basilicum seeds essential oil from Palestine.** BMC Complementary Medicine and Therapies. 2023; 23, Article number: 221.

Background: Many modern pharmaceutical researchers continue to focus on the discovery and evaluation of natural compounds for possible therapies for obesity, diabetes, infections, cancer, and oxidative stress. Extraction of Ocimum basilicum seed essential oil and evaluation of its antioxidant, anti-obesity, antidiabetic, antibacterial, and cytotoxic activities were the goals of the current study.

Method: O. basilicum seed essential oil was extracted and evaluated for its anticancer, antimicrobial, antioxidant, anti-obesity, and anti-diabetic properties utilizing standard biomedical assays.

Results: O. basilicum seed essential oil showed good anticancer activity against Hep3B (IC50 56.23 ± 1.32 µg/ml) and MCF-7 (80.35 ± 1.17 µg/ml) when compared with the positive control, Doxorubicin. In addition, the essential oil showed potent antibacterial (against Klebsiella pneumoniae, Escherichia coli, Staphylococcus aureus, Proteus mirabilis, and Pseudomonas aeruginosa) and antifungal (against Candida albicans) activities. Moreover, as for the anti-amylase test, IC50 was 74.13 ± 1.1 µg/ml, a potent effect compared with the IC50 of acarbose, which was 28.10 ± 0.7 µg/ml. On the other hand, for the anti-lipase test, the IC50 was 112.20 ± 0.7 µg/ml a moderate effect compared with the IC50

of orlistat, which was 12.30 ± 0.8 μg/ml. Finally, the oil had a potent antioxidant effect with an IC50 of 23.44 ± 0.9 μg/ml compared with trolox (IC50 was 2.7 ± 0.5 μg/ml).

Conclusion: This study has provided initial data that supports the importance of O. basilcum essential oil in traditional medicine. The extracted oil not only exhibited significant anticancer, antimicrobial, and antioxidant properties but also antidiabetic and anti-obesity effects, which provided a foundation for future research.

Rambod M, Pasyar N, Karimian Z, Farbood A. **The effect of lemon inhalation aromatherapy on pain, nausea, as well as vomiting and neurovascular assessment in patients for lower extremity fracture surgery: a randomized trial.** BMC Complementary Medicine and Therapies. 2023; 23, Article number: 208.

Background: Complementary and integrative medicine may be effective for postoperative outcomes. This study aimed to determine the effect of lemon inhalation aromatherapy on pain, nausea, and vomiting and neurovascular assessment in patients for lower extremity fracture surgery.

Methods: This is a randomized clinical trial study. Ninety patients who had undergone lower extremity fracture surgery were randomly assigned to the intervention (lemon aromatherapy) and control groups. Lemon aromatherapy was started in the morning of the surgery and extended at two-hour intervals until the end of the surgery, in the recovery room, and 16 h after surgery. Numerical pain and nausea and vomiting scales, the Rhodes Index of Nausea, Vomiting, and Retching, and the WACHS Neurovascular Observation Chart were used to assess the outcomes before and after the intervention (in the recovery room and 4, 8, 12, and 16 h post-surgery). The data were analyzed using the Wilcoxon test, ANCOVA, and Repeated Measure ANCOVA.

Results: A significant difference was observed between the groups in terms of the intensity of pain ($P < 0.001$) and nausea and vomiting ($P = 0.001$) during the study period. Moreover, a significant difference was found between groups as to the frequency and severity of nausea, vomiting, and retching. The amount and duration of postoperative vomiting and nausea were significantly lower in the intervention group compared to the control group. In addition, lemon inhalation aromatherapy decreased the frequency of anti-emetic drug administration in the recovery room ($P = 0.04$) and 16 h post-surgery ($P = 0.03$).

Conclusions: This study indicated that aromatherapy reduced pain intensity, postoperative nausea, vomiting, and retching, as well as the incidence of anti-emetic drug administration. Therefore, using lemon inhalation aromatherapy to relieve pain and reduce nausea and vomiting is suggested for lower extremity fracture patients who have undergone surgery.

Trial registration: This study was registered in the Iranian Registry of Clinical Trail (Number = 57,331, IRCT20130616013690N10, approved 24/07/2021) (https://**www.irct.ir/trial/57331**).

Complementary and alternative medicine

Pyykkönen M, Aarva P, Ahola S, Pasanen M, Helin K. **Use of complementary and integrative health in Finland: a cross-sectional survey.** BMC Complementary Medicine and Therapies. 2023: 23, Article number: 279.

Background: Population based studies have shown large differences in the estimated prevalence of complementary and integrative health (CIH) usage between studies. This is in part due to there being no golden standard definition for CIH. In Finland, an updated and internationally comparable study on the prevalence of CIH usage is needed. In the present study, a modified Finnish version of the International Questionnaire to Measure Use of Complementary and Alternative Medicine (I-CAM-QFI) was utilised to examine prevalence of use of different CIH modalities and their experienced helpfulness in the general Finnish population.

Methods: Respondents aged 16 and above were invited to take part in this descriptive cross-sectional study through an online panel in December 2022. The usage of CIH and the experienced helpfulness were calculated with SPSS (v28) as the proportion of users per each modality. The data were weighted based on gender, age and place of residence.

Results: A total of 3244 respondents completed the survey. CIH was used by 51.1% (95%CI: 49.4–52.8) of the respondents in the 12 months prior to the survey. Self-help practices were the most used category of CIH (28.8%; 95%CI: 27.3–30.4). The prevalence of usage of CIH natural remedies excluding vitamins and minerals was 27.0% (95%CI: 25.5–28.6). CIH providers were visited by 20.4% of the respondents (95%CI: 19.0–21.8). Getting help for a long-term illness or improvement of well-being were often mentioned as the most important reason for the use of different CIH modalities. CIH was generally used more by women compared to men. The large majority found the modalities they used helpful.

Conclusions: The results increase current understanding on CIH usage in Finland. As the majority of users experience CIH as helpful, there is a need to study CIH in the context of public health policies. The estimates of CIH usage are highly dependent on what is considered as CIH, and this should be paid attention to in future studies.

Shah AQ, Noronha N, Chin-See R, Hanna C, Kadri Z, Marwaha A, Rambharack N, Ng JY. **The use and effects of telemedicine on complementary, alternative, and integrative medicine practices: a scoping review.** BMC Complementary Medicine and Therapies. 2023; 23, Article number: 275.

Background: Telemedicine includes the delivery of health-care services and sharing of health information across

distances. Past research has found that telemedicine can play a role in enhancing complementary, alternative, and integrative medicine (CAIM) while allowing the maintenance of cultural values and ancestral knowledge. This scoping review synthesized evidence regarding the use of telemedicine in the context of CAIM.

Methods: Following Arksey and O'Malley's scoping review framework, CINAHL, PsycINFO, MEDLINE, EMBASE and AMED databases were searched systematically. The CADTH website was also searched for grey literature. Eligible articles included a CAIM practice or therapy offered through telemedicine, with no restrictions placed on the type of telemedicine technology used. Inductive thematic analysis was conducted to synthesise common themes among the included studies.

Results: Sixty-two articles were included in this synthesis. The following themes emerged: 1) the practitioner view of CAIM delivered through telemedicine, 2) the patient view of CAIM delivered through telemedicine, and 3) the technological impacts of telemedicine delivery of CAIM.

Conclusions: Studies have shown that telemedicine delivery of CAIM is feasible, acceptable, and results in positive health outcomes. Some barriers remain such as the presence of chronic illness and morbidity, inability to form strong patient-provider relationships relative to face-to-face approaches, and technological difficulties. Future intervention research should focus on reducing such barriers, as well as explore which patient population would realize the greatest benefit from CAIM delivered via telemedicine, and the impact of interventions on providers and caregivers.

Herbal medicine

Yu W, Gao Y, Zhao Z, Long X, Yi Y, Ai S. **Fumigaclavine C ameliorates liver steatosis by attenuating hepatic de novo lipogenesis via modulation of the RhoA/ROCK signaling pathway.** BMC Complementary Medicine and Therapies. 2023; 23, Article number: 288.

Background: Non-alcoholic fatty liver disease (NAFLD) has been well defined as a common chronic liver metabolism disorder. Statins as a first-line therapeutic treatment had some side effects. Here, we found that Fumigaclavine C (FC) was collected from endophytic Aspergillus terreus via the root of Rhizophora stylosa (Rhizophoraceae), had potential anti-adipogenic and hepatoprotective effects both in vitro and in vivo without obvious adverse side effects. However, the mechanisms of the prevention and management of FC for hepatic steatosis are incompletely delineated.

Methods: The pharmacodynamic effects of FC were measured in high-fat diet (HFD)-induced obese mice. Liver index and blood biochemical were examined. Histopathological examination in the liver was performed by hematoxylin & eosin or oil red O. The levels of serum TG, TC, LDL-c, HDL-c, FFA, T-bili, ALT, AST, creatinine, and creatine kinase were estimated via diagnostic assay kits. The levels of hepatic lipid metabolism-related genes were detected via qRT-PCR. The expression levels of hepatic de novo lipogenesis were quantitated with Western blot analysis.

Results: FC-treatment markedly reduced hepatic lipid accumulation in HFD-induced obese mice. FC significantly attenuated the hepatic lipid metabolism and ameliorated liver injury without obvious adverse side effects. Moreover, FC also could dose-dependently modulate the expressions of lipid metabolism-related transcription genes. Mechanically, FC notably suppressed sterol response element binding protein-1c mediated de novo lipogenesis via interfering with the RhoA/ROCK signaling pathway by decreasing the levels of geranylgeranyl diphosphate and farnesyl diphosphate.

Conclusions: These findings suggested that FC could improve hepatic steatosis through inhibiting de novo lipogenesis via modulating the RhoA/ROCK signaling pathway.

Li Y, Wang L, Zhang J, Xu B, Zhan H. **Integrated multi-omics and bioinformatic methods to reveal the mechanisms of sinomenine against diabetic nephropathy.** BMC Complementary Medicine and Therapies. 2023; 23, Article number: 287.

Objectives: Diabetic Nephropathy (DN) is a serious complication of diabetes, the diagnosis and treatment of DN is still limited. Sinomenine (SIN) is an active extract of herbal medicine and has been applied into the therapy of DN.

Methods: In the part of bioinformatic analyses, network pharmacology and molecular docking analyses were conducted to predict the important pathway of SIN treatment for DN. In-vivo study, DN rats were randomized to be treated with vehicle or SIN (20 mg/kg or 40 mg/kg) daily by gavage for 8 weeks. Then, the pharmacological effect of SIN on DN and the potential mechanisms were also evaluated by 24 h albuminuria, histopathological examination, transcriptomics, and metabolomics.

Results: Firstly, network pharmacology and molecular docking were performed to show that SIN might improve DN via AGEs/RAGE, IL-17, JAK, TNF pathways. Urine biochemical parameters showed that SIN treatment could significantly reduce 24 h albuminuria of DN rats. Transcriptomics analysis found SIN could affect DN progression via inflammation and EMT pathways. Metabolic pathway analysis found SIN would mainly involve in arginine biosynthesis, linoleic acid metabolism, arachidonic acid metabolism, and glycerophospholipid metabolism to affect DN development.

Conclusions: We confirmed that SIN could inhibit the progression of DN via affecting multiple genes and metabolites related pathways.

Delam H, Keshtkaran Z, Shokrpour N, Eidi A, Bazrafshan M-R. **The effect of Crocus sativus L.** (saffron) herbal tea on happiness in postmenopausal women: a randomized controlled trial. BMC Complementary Medicine and Therapies. 2023: 23, Article number: 176.

Background: Evidence suggests that menopause can be associated with a variety of negative psychological changes such as depression and anxiety, and improving the mental health status of women during menopause is one of the important priorities and challenges of the health system. The aim of this study was to determine the effect of saffron (Crocus sativus L., Iridaceae) herbal tea on happiness in postmenopausal women.

Methods: In this randomized clinical trial which was conducted in 2021, 72 postmenopausal women were enrolled and divided into intervention and control groups. The randomization blocks method was used for random allocation, and the Oxford Happiness Questionnaire was utilized to measure the scores. The intervention included the use of 30 mg of dried stigmas of the saffron plant, which was boiled once (in the morning, in 300 ml of boiling water for 10–15 min) and consumed with white rock candy as one cup of saffron tea daily. To compare the trend of changes and after removing the effect of other variables, generalized estimating equation (GEE) was used.

Results: There was no significant difference between the intervention and control groups in any of the quantitative and qualitative characteristics ($p > 0.05$). The results of paired samples t-test showed that the happiness mean score in the intervention group increased significantly ($p < 0.001$) from 42.93 ± 8.54 to 61.58 ± 8.24, while in the control group, there was no significant difference between the happiness mean score at the beginning and end of the study ($p = 0.861$). Also, after applying the treatment program in the intervention group, there was a significant difference between the two groups in terms of the happiness mean scores ($p < 0.001$).

Conclusion: Saffron herbal tea had a positive effect on reducing depression and increasing the happiness score; thus, it is recommended that it should be used as a complementary treatment in consultation with the treating physician.

Trial registration: The present study was registered with the code of IRCT20210403050818N1 (Registration date: 09/04/2021) in the Iranian Registry of Clinical Trials. It was also approved by the Ethics Committee of Larestan University of Medical Sciences (Approval ID: IR.LARUMS.REC.1399.017).

Lifestyle medicine

Balata M, Gbreel MI, Elrashedy AA, Westenfeld R, Pfister R, Zimmer S, Nickenig G, Becher MU, Sugiura A. **Clinical effects of cognitive behavioral therapy in heart failure patients: A meta-analysis of randomized controlled trials.** BMC Complementary Medicine and Therapies. 2023; 23, Article number: 280.

Background: About 20–40% of people with Heart failure (HF) suffer from some depression, which is 4–5% greater than the overall population. This depression can lead to undesirable outcomes, including elevated mortality rate and frequent hospitalization.

Purpose: The current study aims to evaluate the impact of cognitive behavioural therapy (CBT) on self-care and the symptoms of depression and anxiety in HF patients.

Methods: We searched PubMed, Web of Science (WOS), Scopus, and Cochrane Library till 15 October 2022. All relevant randomized controlled trials (RCTs) were included. The data were extracted and pooled using Review Manager software (RevMan 5.4). Continuous data were pooled as mean difference and 95% confidence interval (CI).

Results: Our search retrieved 1146 records, and 7 studies (611 patients) were finally included. We assessed the Beck Depression Inventory-II (BDI-II) as the primary outcome of the study. Hamilton Rating Scale for Depression (HRSD-17), Change in Beck Anxiety Inventory, Kansas City Cardiomyopathy Questionnaire (KCCQ), and Self-Care of Heart Failure Index (SCHFI) were also assessed as secondary outcomes. With CBT, BDI-II showed a significant reduction after 4 to 6 months follow-up (MD = -4.87, 95% CI: [-8.06; -1.69], $P = 0.003$) as well as 8 to 9 months follow-up (MD = -5.71, 95% CI: [-8.95; -2.46], $P = 0.0006$). But no significant difference was shown with 3 months follow-up (M.D=-4.34; 95%CI: [-10.70; 2.03], $P = 0.18$).

Conclusions: CBT has long-term (4–9 months) significant favorable outcomes decreasing anxiety and depression compared to non-CBT groups. No significant short-term (less than 3 months) impact on HF patients' self-care, depression, or anxiety were shown.

Reangsing C, Trakooltorwong P, Maneekunwong K, Thepsaw J, Oerther S. **Effects of online mindfulness-based interventions (MBIs) on anxiety symptoms in adults: a systematic review and meta-analysis.** BMC Complementary Medicine and Therapies. 2023; 23, Article number: 269.

Background: An increasing number of studies have documented the effectiveness on various types of face-to-face and online mindfulness-based interventions (MBIs) in reducing anxiety among general population, but there is a scarcity of systematic reviews evaluating evidence of online MBIs on anxiety in adults. Therefore, we examined the effects of online mindfulness-based interventions (MBIs) on anxiety symptoms in adults and explored the moderating effects of participant, methods, and intervention characteristics.

Methods: We systematically searched nine databases through May 2022 without date restrictions. Inclusion criteria were primary studies evaluating online mindfulness-based interventions with adults with anxiety measured as an outcome, a comparison group, and written in English. We used random-effects model to compute effect sizes (ESs) using Hedges' g, a forest plot, and Q and I2 statistics as measures of heterogeneity; we also examined moderator analyses.

Results: Twenty-six primary studies included 3,246 participants (39.9 ± 12.9 years old). Overall, online mindfulness-

based interventions showed significantly improved anxiety (g = 0.35, 95%CI 0.09, 0.62, I2 = 92%) compared to controls. With regards to moderators, researchers reported higher attrition, they reported less beneficial effects on anxiety symptoms (β=-0.001, Qmodel=4.59, p = .032). No other quality indicators moderated the effects of online mindfulness-based interventions on anxiety.

Conclusion: Online mindfulness-based interventions improved anxiety symptoms in adult population. Thus, it might be used as adjunctive or alternative complementary treatment for adults. However, our findings must be interpreted with caution due to the low and unclear power of the sample in primary studies; hence, high-quality studies are needed to confirm our findings.

Laplaud N, Perrochon A, Gallou-Guyot M, Moens M, Goudman L, David R, Rigoard P, Billot M. **Management of post-traumatic stress disorder symptoms by yoga: An overview.** BMC Complementary Medicine and Therapies. 2023; 23, Article number: 258.

Background: Posttraumatic stress disorder (PTSD) can occur after trauma. While PTSD management strategies include first-line pharmacotherapy and psychotherapy, mind–body therapies, such as yoga, are applied in the PTSD population. This overview aimed to summarize the effectiveness of yoga interventions on PTSD symptoms in adults in a systematic review (SR) including randomized controlled trials (RCTs).

Method: We searched for SR with or without meta-analysis of RCTs involving adults with PTSD diagnosis or trauma history. The search was conducted until April 2022, through six databases (Cochrane Database, MEDLINE (Pubmed), Scopus, Embase, CINHAL and PEDro). The primary outcome was the evolution of PTSD symptoms throughout the intervention. Secondary outcomes included follow-up, safety, adherence, and cost of the intervention. Two authors independently performed the selection, data extraction and risk of bias assessment with the AMSTAR 2 tool and overlap calculation. This overview is a qualitative summary of the results obtained in the selected studies.

Results: Eleven SRs were analyzed, of which 8 included meta-analyses. The overlap between studies was considered very high (corrected covered area of 21%). Fifty-nine RCTs involving 4434 participants were included. Yoga had a significant small-to-moderate effect-size on PTSD symptom decrease in 7 SRs and non-significant effects in 1 SR with meta-analysis. All SR without meta-analysis found beneficial effects of yoga on PTSD. Secondary outcomes were not sufficiently assessed to provide clear evidence. Results should be interpreted with caution as 1 SR was rated as at moderate risk of bias, 3 as low and 7 as critically low.

Conclusions: While yoga therapy seems promising for decreasing PTSD symptoms, future research should standardize yoga therapy duration/frequency/type and consider long-term efficacy to better delineate yoga therapy efficacy in PTSD patients.

Sedaghati P, Derakhshan KF, Ahmadabadi S, Moghaddam SRR. **Effects of corrective and breathing exercises on respiratory function of older adults with a history of COVID-19 infection: a randomized controlled trial.** BMC Complementary Medicine and Therapies. 2023; 23, Article number: 199.

Background: Patients with a history of COVID-19 infection may suffer from different physical problems. This study aimed to investigate the effect of corrective and breathing exercises on improving respiratory function among patients with a history of COVID-19 infection.

Methods: In this clinical trial study, thirty elderlies with a history of COVID-19 disease were divided into two groups (mean age 63.60 ± 3.56 experimental, 59.87 ± 2.99 control groups) based on the study inclusion criteria. Exercise interventions included two sections- breathing exercises and corrective exercises in the cervical and thoracic spine. The spirometry test, craniovertebral angle, and thoracic kyphosis test were used. To evaluate differences between variables, paired-samples t-test and ANCOVA were used (p-value < 0.01). Also, Eta-squared was measured to assess the effect size.

Results: Results showed a significant difference between the two groups in craniovertebral angle (P = 0.001), thoracic kyphosis (P = 0.007), and respiratory capacity including Forced expiratory volume in one second (FEV1) (P = 0.002), FEV1/FVC (P = 0.003), Peripheral oxygen saturation (SPO2) (P = 0.001), while no significant differences were observed between two groups in terms of chest anthropometric indices (P > 0.01). The Eta-squared value of 0.51 for the Craniovertebral angle and the SPO2 indicates a large effect size.

Conclusions: The results showed the combination of corrective and breathing exercises could improve pulmonary function and correct cervical and thoracic posture in patients with a history of COVID-19 infection. Therefore, corrective and breathing exercises can be helpful as a complementary treatment along with pharmaceutical therapy to reduce chronic pulmonary complications in patients infected with COVID-19.

Trial registration: This research was registered in the Iranian Registry of Clinical Trials (IRCT registration number: IRCT20160815029373N7, First trial registration: 23/08/2021, Registration date: 01/09/2021).

Namazinia M, Mazlum SR, Mohajer S, Lopez V. **Effects of laughter yoga on health-related quality of life in cancer patients undergoing chemotherapy: a randomized clinical trial.** BMC Complementary Medicine and Therapies. 2023; 23, Article number: 192.

Background: Chemotherapy is associated with a wide range of physical and psychological side effects, so complementary and alternative therapies may be practiced as an independent

treatment or combined with the standard ones to improve health-related quality of life of cancer patients. Laughter yoga has predominantly been used as a complementary therapy to enhance health and wellbeing of ordinary people and patients with chronic diseases. However, to date, few studies have evaluated the effects of this modern exercise on cancer patients undergoing chemotherapy in clinical settings, to the best of the authors' knowledge. the present study aimed to investigate the effects of Laughter Yoga on the health-related quality of life of cancer patients undergoing chemotherapy.

Methods: This study was a two-group randomized clinical trial on 69 cancer patients undergoing chemotherapy at Reza Radiotherapy and Oncology Center, Iran in 2018. Patients were randomly divided into intervention and control groups. The intervention group received laughter yoga for four sessions at one-week intervals. Each session consists of one part and lasts for 20–30 min. Patients' health-related quality of life was assessed before and after the laughter yoga sessions using Quality of Life Questionnaire European Organization for Research and Treatment of Cancer (EORTC QLQ-C30) version 3.0. SPSS Statistics (v.20 software was used to conduct Chi-square, independent t-test, Mann-Whitney, Wilcoxon and paired t-tests analyses of the data.

Results: The number of participants in intervention and control groups were 34 and 35, there was no significant difference of demographic and disease related characteristics and pre-intervention HRQOL between two groups. In the intervention group, there is significant difference between pre- and post-intervention scores (Mean ± Standard Deviation) of emotional functioning (12.99 ± 10.49), physical functioning (0.78 ± 6.08), role functioning (3.43 ± 7.97), fatigue (-8.82 ± 22.01), pain (-8.33 ± 11.78), sleep disturbance (-15.68 ± 18.77), and global health and quality of life (6.37 ± 5.04) ($p < 0.05$). There was no significant change in the control group. Participants reported no adverse events.

Conclusions: A structured laughter yoga intervention in a hospital setting effectively improved health-related quality of life for cancer patients undergoing chemotherapy. Benefits to many patients could be expected if this would become a part of routine care.

Trial Registration: This study was registered in the Iranian Registry of Clinical Trials (no. IRCT20180429039463N1) on 21/08/2018.

Massage, myotherapy and other bodywork

***da Silva FC, Vieira LS, Santos LV, Gaudreault N, Cruvinel-Júnior RH, Santos GM.* Effectiveness of visceral fascial therapy targeting visceral dysfunctions outcome: Systematic review of randomized controlled trials.** BMC Complementary Medicine and Therapies. 2023; 23, Article number: 274.

Background: Fascial Therapy is an ancient and widespread practice throughout the world. These approaches are very common in osteopathic practice and taught in workshops for professionals from different areas of health care, including Physiotherapy. This type of treatment is quite specialized and centered on the therapist. However, there is a lack of high-quality and low-risk bias studies that justify the use of this practice. Despite this, there is little scientific evidence about the effectiveness of Fascial Therapy to treat some visceral disorders. The purpose of this study was to critically appraise the scientific literature concerning the clinical efficacy of techniques used in Fascial Therapy targeting the visceral system.

Methods: This systematic review included randomized controlled trials in any language or date of publication. All primary outcomes reported were included. The methodological quality and statistical reporting of each eligible trial were evaluated using the version 2 of the Cochrane risk-of-bias tool for randomized trials (RoB 2). This systematic review provided a synthesis of current evidence on the effects of Fascial Therapy in patients with visceral disorders and/or pain. A total of 11 studies were included, with five of them covering gastrointestinal dysfunction, two covering cardiorespiratory dysfunction, two covering musculoskeletal dysfunction, and two covering urogenital dysfunction.

Results: Fascial Therapy targeting the visceral system has been shown to be effective in reducing pain over the long term in people with low back pain when combined with standard physical therapy and effective in reducing gastroesophageal reflux symptoms over the short term. Considering the overall bias, six studies were at high risk of bias, two studies had some concerns and only three studies were at low risk of bias. Of the three studies with a low risk of bias, only two showed positive results and were effective in improving the studied outcome.

Conclusion: This systematic review shows that currently, there is poor evidence for the efficacy of the techniques used in Fascial Therapy targeting the visceral system, and this information can help healthcare professionals in decision-making related to the use of Fascial Therapy targeting the visceral system in patients with visceral disorders and/or pain.

***Pryde K; Brusco N; O'Callaghan C; Baird A; Moore R; White J; Bull C; Lee AL; Michael N.* Caregiver delivered massage therapy options in inpatient palliative care: A mixed methods exploratory study.** Complement Ther Clin Pract. 2022; 49.

Background and purpose: Massage therapy can benefit palliative care inpatients and this intervention could be provided by trained caregivers in this setting. This study aimed to determine the feasibility and acceptance of caregiver massage therapy, to explore patients' and caregivers' experience of massage therapy, and examine staff perspectives about caregiver massage therapy in palliative care.

Materials and methods: This was a mixed methods, convergent, study

design. Inpatient palliative care patients were offered massage provided by a caregiver, following training. Caregiver massage therapy was provided up to five days post training. Patients and caregivers completed self-report measures of satisfaction for the five-day intervention, while caregivers rated massage-related burden and confidence. Healthcare professionals working in inpatient palliative care participated in a focus group, during which enablers and barriers to caregiver massage therapy were explored.

Results: Over the three-month recruitment period, 62 participants were available for recruitment. Of these, 23 (37%) consented to caregiver massage. Caregiver burden was highest on day 2 (mean 2.9/5) while confidence was highest on day 4 (mean 4.1/5). Caregivers and patients were satisfied with the massage training sessions, and patients reported perceptions of comfort during subsequent sessions. Staff-identified enablers to caregiver massage therapy included patient symptom improvement and caregiver empowerment but considered caregiver massage potentially burdensome for caregivers.

Conclusion: Caregiver massage training is feasible, with a modest acceptance within an inpatient palliative care unit. Enablers of massage therapy in inpatient palliative care were caregiver empowerment, but this model was perceived as potentially burdensome for caregivers by healthcare professionals. Highlights: Caregiver massage training is feasible with a modest acceptance within an inpatient palliative care unit. Caregivers reported increased confidence with massage provision during consecutive sessions. Patients reported the training to be effective and considerate of their needs. Healthcare staff identified caregiver massage therapy was enabled by symptom improvement.

Naturopathy

Steel A, Brand S, Leach M, Lloyd I, Ward V. **Patient-shared knowledge and information in clinical decision-making: an international survey of the perspectives and experiences of naturopathic practitioners.** BMC Complementary Medicine and Therapies. 2023; 23, Article number: 247.

Introduction: Most knowledge translation models pay relatively little attention to patient-held knowledge and are largely based on the premise that researchers and clinicians hold all valuable knowledge, and patients are passive recipients of such knowledge. Counter to this clinician- and researcher-centred lens is a growing interest and awareness of patients as experts in their health. While naturopathic medicine is described and experienced as a patient-centred system of traditional medicine, the position of patient-held knowledge is unclear particularly when considered alongside their use of other more objective forms of knowledge such as research evidence.

Methods: This international online cross-sectional survey aimed to explore naturopathic practitioners' perceptions of the value and contribution of patient-shared knowledge and information within the context of naturopathic clinical consultations.

Results: The survey was completed by 453 naturopathic practitioners (response rate: 74.3%). Approximately two-thirds (68.2%) of respondents reported using information shared by the patient. Most rated 'information provided by the patient' as either 'extremely important' (60.7%) or 'very important' (31.4%) to patients. Highest levels of trust were reported for information provided by the patient ('completely': 9.9%; 'a lot': 53.6%). Most practitioners indicated they trusted knowledge and information derived from the patient's personal health history 'completely' (n = 79; 21.8%) or 'a lot' (n = 226; 62.4%) from the patient's perspective of living with a health condition ('completely' [n = 63, 17.4%]; 'a lot' [n = 224, 61.9%]). Patients were the highest ranked stakeholder group (mean: 1.5) perceived to influence NP use of patient experience of living with a health condition to inform clinical decision-making.

Conclusion: Researchers and policy makers are increasingly focused on the value of the 'expert patient' in clinical decision-making, yet health professionals' report challenges and, in some cases, resistance to meaningfully engaging with patient-shared knowledge in practice. However, our study has found patient-shared knowledge – inclusive of patient experience of their health condition – is among the knowledge used and trusted by naturopathic practitioners to inform their clinical decision-making. This study both offers insights into the knowledge translation behaviours of an under-researched health profession and provides a novel contribution to the wider aim of adopting patient-shared knowledge into clinical care more generally.

Nutrition

Fu Z, Lv J, Gao X, Zheng H, Shi S, Xu X, Zhang B, Wu H, Song Q. **Effects of garlic supplementation on components of metabolic syndrome: a systematic review, meta-analysis, and meta-regression of randomized controlled trials/ BMC Complementary Medicine and Therapies.** 2023: 23, Article number: 260.

Background: Garlic (Allium sativum), the underground bulb of the Allium genus, has been consumed on Earth for thousands of years. Many clinical trials of garlic supplementation on components of metabolic syndrome (MetS) have emerged in recent years, but there is no consensus on the effect. This meta-analysis aimed at systematically evaluating the effect of garlic supplementation on components of MetS.

Methods: In this meta-analysis, we searched Pubmed, Embase, Cochrane, Medline, Web of Science databases, and clinical trials online sites from inception to November 1, 2022, with language restrictions to English. We engaged participants > 18 years and eligible for the clinical diagnosis of MetS or those with metabolic disorders and garlic was the only intervention. Outcomes included waist circumference, and body mass index, triglycerides, total cholesterol, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, blood pressure, and fasting blood glucose.

Meta-regression and subgroup analyses were conducted based on six covariates (total sample size, the mean age, the mean dose, the duration of intervention, the oral form of garlic, and the dietary intervention).

Results: Results from 19 RCTs were included engaging 999 participants. Compared to placebo, garlic significantly reduced TG [SMD (95%CI) = -0.66 (-1.23, -0.09)], TC [SMD (95%CI) = -0.43 (-0.86, -0.01)], LDL [SMD (95%CI) = -0.44(-0.88, -0.01)], DBP [SMD (95%CI) = -1.33 (-2.14, -0.53)], BMI [SMD (95%CI) = -1.10(-1.90, -0.20)], and WC [SMD (95%CI) = -0.78(-1.09, -0.47)]. Meta-regression showed age and sample size are potential effect modifiers.

Conclusion: According to the results of meta-analysis, the modulatory effect of garlic on some MetS components is evident. More high-quality, large-scale RCTs are needed to confirm iat based on the high heterogeneity and potential publication bias of the current data.

Trial registration: https://**www.crd.york.ac.uk/prospero/display_**record.php?RecordID=373228, ID: CRD42022373228.

***Saber A, Abedimanesh N, Somi M-H, Khosroushahi AY, Moradi S.* Anticancer properties of red beetroot hydro-alcoholic extract and its main constituent; betanin on colorectal cancer cell lines.** BMC Complementary Medicine and Therapies. 2023; 23, Article number: 246.

Colorectal cancer (CRC) is the third most common type of cancer worldwide. Red beetroot (Beta vulgaris) contains Betanin as its major betacyanin, possessing wide proapoptotic effects. This study aimed to investigate the anticancer and pro-papoptotic effects of beetroot hydro-alcoholic extract (BHE) and betanin, on colorectal cancer cell lines. BHE and betanin were used to treat Caco-2 and HT-29 colorectal cancer cells. MTT assay, DAPI staining, and FACS-flow cytometry tests were used to determine the half-maximal inhibitory concentration (IC50) and apoptosis-inducing evaluations. Intended genes were assessed by real-time polymerase chain reaction (RT-PCR). The IC50 for HT-29 and Caco-2 cell lines were 92 µg/mL, 107 µg/mL for BHE, and 64 µg/mL, 90 µg/mL for betanin at 48 h, respectively. BHE and betanin significantly inhibited the growth of both cancer cell lines time and dose-dependently. DAPI staining and flow cytometry results revealed significant apoptosis symptoms in treated cancerous cell lines. The expression level of proapoptotic genes (BAD, Caspase-3, Caspase-8, Caspase-9, and Fas-R) in treated HT-29 and Caco-2 cells was higher than in untreated and normal cells. In contrast, the anti-apoptotic gene (Bcl-2) was significantly downregulated. BHE and betanin effectively inhibited cancer cell proliferation and induced apoptosis via the modification of effective genes.

***Lange KW, Lange KM, Nakamura Y, Reissmann A.* Nutrition in the Management of ADHD: A Review of Recent Research.** Curr Nutr Rep. 2023. doi: 10.1007/s13668-023-00487-8.

Purpose of review: Various nutrients and diet quality have been suggested to be involved in the pathophysiology of ADHD. The purpose of this review was to examine data from recent cohort studies and dietary interventions to determine whether nutrition may play a role in the management of ADHD.

Recent findings: Preliminary evidence suggests that minerals might have beneficial effects on ADHD symptomatology. Probiotics might offer novel strategies to prevent or treat ADHD. Inverse associations between adherence to "healthy" diets and ADHD symptoms have been observed. Children with ADHD responding to the few-foods diet (or oligoantigenic diet) with an elimination of individually identified food items show substantially improved behavior and cognitive functioning. Evidence from recent research does not allow any recommendations regarding the use of micronutrients or probiotics in the management of ADHD. The few-foods diet may become an additional therapeutic option for children with ADHD.

***Paoli A, Bianco A, Moro T, Mota JF, Coelho-Ravagnani CF.* The Effects of Ketogenic Diet on Insulin Sensitivity and Weight Loss, Which Came First: The Chicken or the Egg? Nutrients.** 2023 Jul 12;15(14):3120. doi: 10.3390/nu15143120. PMID: 37513538; PMCID: PMC10385501.

The ketogenic diet (KD) is, nowadays, considered an interesting nutritional approach for weight loss and improvement in insulin resistance. Nevertheless, most of the studies available in the literature do not allow a clear distinction between its effects on insulin sensitivity per se, and the effects of weight loss induced by KDs on insulin sensitivity. In this review, we discuss the scientific evidence on the direct and weight loss mediated effects of KDs on glycemic status in humans, describing the KD's biochemical background and the underlying mechanisms.

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HEALTH FUND UPDATE

Health Fund	Acupuncture	Chinese Herbal Medicine	Counselling	Hypnotherapy	Nutrition	Remedial Massage *(Certificate IV)*	Remedial Massage *(HLT Diploma qualification)*	Remedial Therapies *(No longer ATMS Accredited)*	Traditional Chinese Remedial Massage *(Certificate IV)*	Traditional Chinese Remedial Massage *(HLT Diploma or higher level qualfication)*
Australian Health Management	✓	✓			✓		✓			
Australian Regional Health Group										
ACA Health Benefits Fund	✓	✓				✓	✓	◆		
CUA Health *(Credicare)*	✓	✓			✓	✓	✓	◆		
Defence Health	✓						✓	◆		
GMHBA *(Geelong Medical)*	✓	✓					✓	◆		
Frank Health Fund & Health.com.au	✓	✓					✓	◆		
Health Care Insurance Limited	✓	✓				✓	✓	◆		
HBF	✓	✓		✓	✓		✓	◆		
Health.com.au	✓	✓			✓		✓	◆		
Health Partners		✓				✓	✓			
HIF *(Health Insurance Fund of WA)*	✓	✓				✓	✓	◆		
Hunter Health *(previously known as Cessnolck DHBF)*	✓	✓				✓	✓	◆		
Latrobe Health Services	✓					✓	✓	◆		
MDHF (Mildura District Hospital Fund)	✓				✓	✓	✓			
AIA Health *(previously known as MyOwn Health)*	✓						✓	◆		
Navy Health Fund	✓	✓				✓	✓	◆		
Nurses & Midwives Health	✓	✓				✓	✓			
Onemedifund	✓	✓				✓	✓	◆		
Peoplecare Health Insurance	✓	✓				✓	✓	◆		
Phoenix Health Fund	✓				✓	✓	✓	◆		
Police Health Fund (including Emergency Services)	✓	✓				✓	✓	◆		
Queensland Country Health	✓	✓			✓	✓	✓			
Reserve Bank Health Society	✓	✓				✓	✓	◆		
St Lukes	✓	✓				✓	✓	◆		
Teachers Health	✓	✓				✓	✓	◆		
Teachers Union Health	✓					✓	✓	◆		
Transport Health	✓	✓				✓	✓	◆		
Westfund	✓	✓			✓	✓	✓	◆		
Australian Unity	✓	✓		✓	✓		✓			
BUPA	✓	✓					✓			✓
CBHS Health Fund	✓	✓				✓	✓		✓	✓
Doctors Health Fund							✓			
HCF (inc Railway and Transport)	✓	✓					✓			
Medibank Private	✓	✓	✓	✓	✓		✓			✓
NIB (inc AAMI QANTAS, GU HEALTH, & APIA)	✓	✓			✓		✓			

✓ *Therapy covered by Fund*

Please note that this table is only a guide to show what funds cover ATMS accredited modalities. If the modality that you are accredited for is not listed, this means that no health fund covers the modality. The only exceptions are Chiropractic and Osteopathy. ATMS accreditation in a modality does not guarantee provider status as all funds have their individual set of strict eligibility requirements. Please see our website www.atms.com.au or contact our office for current requirements. Rebates do not usually cover medicines, only face to face consultations. For further rebate terms and conditions, patients should contact their health fund. Policies may change without prior notice.

◆ ARHG are only recognising Remedial Therapists who are accredited for this modality and were approved for ARHG Provider status under their old criteria.

NOTE: Chinese Remedial Massage. ARHG are recognising Chinese Remedial Massage as Remedial Massage. The eligibility requirements are a Govt Accredited HLT Dip Chinese Remedial Massage and the provider number is exactly the same as Remedial Massage. See ARHG Health Fund Information for further information.

Terms and conditions of provider status are located on the ATMS website under the health funds tab.

The Four Pillars to remain current with Health Fund Registration

1. Maintain ATMS Membership

2. Maintain current First Aid

3. Maintain current Professional Indemnity Insurance (Chinese Medicine practitioners require a minimum of $5 million and Remedial Massage practitioners require a minimum of $2 million)

4. CPE (continuing professional education) (ATMS accepts completed CPE that enhances clinical practice however Health Funds require CPE to be modality specific)

Acupuncture and Chinese Herbal Medicine practitioners must hold current AHPRA registration

Working With Children

Practitioners working with under 18's MUST hold a current WWC (Working With Children Check) in their practising state. Please send ATMS a copy to **info@atms.com.au**

Additionally to holding a current WWC, ATMS require that the parent of the child or guardian MUST be present during the consultation.

Current renewal certification is essential

Please forward all renewals ASAP to prevent disruption of your health fund provider registration: renewals of your insurance, first aid, AHPRA registration and WWC to **info@atms.com.au** as ATMS must hold a current copy at all times for health fund compliance.

*Lapsed membership, insurance or first aid, or non-compliance with CPE, will result in a member being removed from the health funds list. As health funds change their provider eligibility requirements at any given time, upgrading qualifications may be necessary to be re-instated with some health funds.

Clinical Records

Please note that whilst there is no law or regulation requiring patient clinical notes to be taken in English, many of the major health funds do require patient clinical notes to be taken in English. **Failure to do this will be a breach of the Health Funds Terms and Conditions and may result in the practitioner being removed as a provider for that health fund.**

Receipting Information

- Medibank/AHM do not accept handwritten receipts (As of April 2021), they must be electronic.

- Sample receipt can be found on our website in the Health Fund tab

- Receipts must be numbered.

- Only one modality per day can be claimed by a client.

Treating Family, Partners and Business Partners of the Clinic

Health Funds do not permit the payment of benefits if the treated member is a partner, dependent, parent, sibling, or business partner of the servicing provider.

By definition, a provider can only perform one initial consultation with a member. Initial consultations attract a higher benefit than a subsequent consult. Only one 'initial consult' is allowed for any patient per condition.

Health Fund Clinic address requirements

It is **MANDATORY** that you provide the full clinic address with the street number, street name, suburb, state, and post code, phone number and email address. No PO Boxes acceptable. All updates are forwarded to the health funds by ATMS.

***Note Medibank have a limit of 3 clinic addresses for Remedial Massage practitioners and Bupa have a limit of 4 clinic addresses regardless of the modality.**

Sharing provider numbers is fraud and against the law

An Accredited member must never allow anyone to use their provider details, as this constitutes health fund fraud. Health fund fraud is a criminal offence which may involve a police investigation and expulsion from the ATMS Register of Members.

No health funds rebate on mobile services

Mobile Services are services at Hotels, Markets, Retreats or Corporate.

Home visits

Health Funds that do not home visit services for rebates are: Aust Unity, CBHS, GU Health and NIB. Home Visit must be Stamped or pre-printed on the receipt.

Gift vouchers

Most Health Funds do not accept Gift Vouchers as the person receiving the treatment did not pay for the service.
It is up to the Health Fund should they recognise it.

Being a provider implies acceptance of the terms and conditions for the health funds

It is of note that the health funds require practitioners to be in private practice. Some health funds will not recognise claims where accommodation, facilities or services are provided or subsidised by another party such as a public hospital or publicly funded facility. Rebates are only claimable for the face-to-face consultation (not the medicines or remedies); however, this does not extend to mobile work including markets, corporate or hotels.

Online or phone consultations are not recognised for health fund rebates

Please be aware that whilst a health fund may indicate that they provide a rebate for specific modalities, this rebate may only be claimable if the client has the appropriate level of health cover with that fund and has not exceeded any limits on how much they are eligible to claim back over a certain period of time.

Acupuncture & Chinese Herbal Medicine overseas qualification (health funds do not accept any other modality completed overseas)

Health Funds do accept overseas Acupuncture and Chinese Herbal Medicine qualifications. The below documents are required:

- VETASSES letter stating the qualification is equivalent/comparable to the Australian BA Health Science TCM/Acupuncture
- Genuine Letter this states that the qualification is a genuine qualification
- IELTS Overall Band Level 7 in English Competency (Bupa only)

Specific requirements for individual health funds

Australian Health Management (AHM)

Names and details of eligible ATMS members will be sent to AHM. Provider numbers will be populated in the ATMS member portal.

HBF, Nurses & Midwives, Railway and Transport, Teachers Health – Hypnotherapy

Names and details of eligible ATMS members will be sent for this modality each month.

Australian Unity

Names and details of eligible ATMS members will be sent to Australian Unity. ATMS members will need to contact Australian Unity initially on 1800 035 360 to register as a provider, after filling out the Australian Unity Application Form located on the ATMS website to activate their provider status.

BUPA

Names and details of eligible ATMS members will be sent to BUPA. Provider numbers will be populated in the ATMS member portal.

CBHS Health Fund Limited

Names and details of eligible ATMS members will be sent to CBHS. Use your ATMS member number as your provider number e.g., ATMS23345.

Doctors Health Fund

Names and details of eligible ATMS members will be sent to Doctors Health Fund. Use your ATMS member number as your provider number for e.g., ATMS23345. Please note that Doctors Health Fund only covers Remedial Massage.

HCF

Names and details of eligible ATMS members will be sent to HCF. Use your ATMS member number as your provider number e.g., ATMS23345.

Medibank Private

Names and details of eligible ATMS members will be sent to Medibank Private. Provider numbers will be populated in the member portal as well as emailed directly to the practitioner as an attached letter. This letter is required for HICAPS Registration.

NIB including APIA, AAMI Health Insurance, Qantas Health Insurance & GU Health

Names and details of eligible ATMS members will be sent to NIB. Use your ATMS member number as your provider number e.g., ATMS23345.

Australian Regional Health Group (ARHG) Refer to Health Funds Table for the individual funds listed under ARHG.

Details of eligible members are sent to ARHG.

The ARHG provider number is based on your ATMS number with additional lettering. To work out your ARHG provider number please follow these steps:

1. Add the letters AT to the front of your ATMS member number
2. If your ATMS number has five digits go to step 3. If it has two, three or four digits, you need to add enough zeros to the front to make it a five-digit number (e.g., 123 becomes 00123).
3. Add the letter that corresponds to your accredited modality at the end of the provider number;

A Acupuncture
C Chinese Herbal Medicine
U Nutrition
Y Myotherapy
R Remedial Massage
M Massage Therapy

For e.g., If your ATMS member number is 123 and accredited for Acupuncture, the ARHG provider number will be AT00123A.

▼ Special condition applies for Remedial Massage for the below funds under ARHG:

- Defence Health▼
- GMHBA ▼ (Including Frank Health Fund)
- HBF (Including GMF Health) ▼
- AIA Health ▼

ARHG -Chinese Massage

ARHG do not recognise Chinese Massage. They categorise it as Remedial Massage. For members that hold a Govt Accredited HLT Diploma of Chinese Remedial Massage HLT50102, HLT50107 or HLT50112 are required to use the 'R' status.

Most Funds recognise the 'R' status however there is a couple that prefer the M status, refer to the health funds table.

HICAPS

ATMS members who wish to activate these facilities need to register directly with HICAPS. HICAPS do not cover all health funds and modalities. Please go to **www.hicaps.com.au** or call 1800 805 780 for further information.

Continuing Professional Education

Continuing Professional Education (CPE) is a structured program of further education for practitioners in their professional occupations.

The ATMS CPE policy is designed to ensure its practitioners regularly update their clinical skills and professional knowledge. One of the main aims of CPE is to keep members abreast of current research and new developments which inform contemporary clinical practice.

The ATMS CPE policy is based on the following principles:

- Easily accessible to all members, regardless of geographic location
- Members should not be given broad latitude in the selection and design of their individual learning programs
- Applicable to not only the disciplines in which a member has ATMS accreditation, but also to other practices that are relevant to clinical practice which ATMS does not accredit (e.g. Ayurveda, yoga)
- Applicable to not only clinical practice, but also to all activities associated with managing a small business (e.g. book-keeping, advertising)
- Seminars, workshops and conferences that qualify for CPE points must be of a high standard and encompass both broad based topics as well as discipline-specific topics
- Financially viable, so that costs will not inhibit participation by members, especially those in remote areas
- Relevant to the learning needs of practitioners, taking into account different learning styles and needs
- Collaborative processes between professional complementary medicine associations, teaching institutions, suppliers of therapeutic goods and devices and government agencies to offer members the widest possible choice in CPE activities
- Emphasis on consultation and co-operation with ATMS members in the development and implementation of the CPE program

ATMS members can gain CPE points through a wide range of professional activities in accordance with the ATMS CPE policy. CPE activities are described in the CPE policy document as well as the CPE Record. These documents can be obtained from the ATMS office (telephone 1800 456 855, fax (02) 9809 7570, or email **info@atms.com.au**) or downloaded from the ATMS website at **www.atms.com.au.**

It is a mandatory requirement of ATMS membership that members accumulate 20 CPE points per financial year. CPE points can be gained by selecting any of the following articles, reading them carefully and critically reflecting on how the information in the article may influence your own practice and/or understanding of complementary medicine practice. You can gain one (1) CPE point per article to a maximum of three (3) CPE points per journal from this activity:

- **McEwen B, Martin T. Chronic fatigue syndrome: The potential of nutritional medicine**
- **Mackenzie T, Brinkworth C. Refined Buglossoides Arvensis seed oil: A regeneratively grown novel omega source**
- **Medhurst R. An Update on Research in Homeopathy**
- **All things inflammation: Lisa Costa-Bir interviews Dr Tim Crowe**
- **Gamble J. The problem with Copper: Part 1**
- **Scriberras A. Kinesiology and transgenerational emotional traumas, and epigenetic influences on emotional well-being**

As part of your critical reflection and analysis, answer in approximately 100 words the following questions for each of the three articles:

1. What new information did I learn from this article?
2. In what ways will this information affect my clinical prescribing/ techniques and/or my understanding of complementary medicine practice?
3. In what ways has my attitude to this topic changed?

Record your answers clearly on paper for each article. Date and sign the sheets and attach to your ATMS CPE Record. As a condition of membership, the CPE Record must be kept in a safe place, and be produced on request from ATMS.

Herbal farming and manufacturing update

by Warren Morey | Herbalist and Manager of the Pharmaceutical Plant Company

Manufacturing of Liquid Herbal extracts remains busy based on strong customer demand.

The new batch of aged garlic extract was processed recently, making the entire factory smell like a pizza shop. Garlic extract is a popular remedy in animal health on Organic Dairy farms.

PPC has an extensive range of Herbal Extracts and Fresh Plant Tinctures but the 80/20 rule still applies to this business like all others. 80% of sales come from 20% of the herbs. The high-volume herbs are adaptogens like Withania/Ashwagandha and Siberian Ginseng, Liver tonics like St Marys Thistle, anti-inflammatory herbs like Turmeric and Immune herbs like Echinacea and Reishi.

Farming by Ronald van de Winckel

This season the weather for growing medicinal plants in Tasmania has been quite good. Enough rain so at least the perennials and younger medicinal trees and shrubs (ginkgo, birches, raspberry, hawthorns can go without any additional water. Most of the annual herbs still needed some additional water to support them as young seedlings in the field. In general, we need only about 20% of the water what is normally used in cropping vegetables.

Some years ago, we changed from keeping cattle to sheep because sheep are very useful as farmhands (200 of them!) to clean out weeds in herb fields while also putting some manure in at the same time. Of course, not in the middle of summer but soon after harvest until well into spring. It seems they prefer the weeds growing under the herbs instead of green grass headlands around them. The photo shows sheep enjoying a few days in the lavender.

Covid is still playing havoc with our yearly planning of what medicinal plants to grow and process. It seems demand for adaptogenic herbs, Astragalus, Withania/Ashwagandha, which increased a lot in the past 2-3 years will still be strong, as is the need for relaxing herbs like passionflower. In the past 40 years of growing herbs there have always been “winners and losers” in the 100+ assortment of medicinal plants we grow. But never as unexpected and quick. Adapting to changing market demands is especially important when growing organic certified and perennial herbs.

A lot more labour goes into an organic crop than in a conventionally grown crop before harvest so knowing that there will be a demand is crucial. Luckily if herbalist demand changes we can find another use for most medicinal plants by drying the harvest for tea instead of producing TGA licensed liquid tinctures.

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*If you have further questions, please email me at **warren.morey@ppcherbs.com.au***

Disclaimer: The views and opinions expressed in these advertorials are those of the authors and do not necessarily reflect the opinions of ATMS or its Directors.

Adaptogens and post-viral syndromes

by Laura Dwyer | BHSc (Naturopathy)

Post-viral syndromes

Considerable research suggests acute pathogens can survive in their latent forms driving chronic, persisting, and debilitating symptoms.[1] The pathogenesis and progression of viral infections is a multistep process and therefore requires treatments that modulate the innate and adaptive immune system as well as inflammatory and oxidative stress pathways.[2] Moreover, as the neuroendocrine-immune system responds to infections and stressful events via various messengers,[3] restoring homeostasis of this system is paramount.

Adaptogens for post-viral syndromes

Adaptogens play a vital role in convalescence and recovery from infection by promoting optimal response of function, regulating energy via its effects on the neuroendocrine-immune system, and supporting healthy stress response via the HPA-axis.[4] Moreover, in traditional Chinese medicine (TCM), certain adaptogens are well known to restore Qi, which is loosely translated as 'life vital force' with the quality, quantity, and balance of Qi determining the overall state of health.

Astragalus

Astragalus is one of the most popular Qi-tonifying herbs used in TCM formulas to improve fatigue, weakness, palpitation with shortness of breath, and dizziness.[5,6] Polysaccharides are one of the main bioactive compounds, with preliminary evidence confirming their ability to increase white blood cell production, NK cell activity, and T-regulatory cells, correct Th1/Th2 cytokine balance, and reduce pro-inflammatory cytokines.[7-11]

Astragalus has been shown to reduce the duration and incidence of the common cold,[8] and was often added to TCM herbal formulas for managing severe acute respiratory syndrome.[12] Results from various trials suggest astragalus stimulates immunocompetent cells in cancer patients,[13-15] and alongside other herbs, has been shown to decrease fatigue in athletes, patients with post-acute stroke, adults with chronic fatigue, and the elderly.[16-21] Moreover, astragalus attenuated immunosuppression in athletes exposed to strenuous exercise by restoring immunological balance and stabilising NK cells.[22]

Codonopsis

Codonopsis is an important TCM tonic that replenishes Qi, nourishes the stomach, and promotes blood flow.[23] In preclinical studies, codonopsis exerted beneficial effects on maintaining T-cell homeostasis, modifying the microbiota, and increasing the weight of the spleen and thymus, suggesting immune-modulating effects.[24-26]

Multiple trials showed significant benefits in lung function, quality of life, and exercise capacity after codonopsis supplementation in patients with chronic obstructive pulmonary disease.[26] Codonopsis has additionally been shown to reduce the severity of altitude sickness in various clinical studies, potentially by improving blood stasis, invigorating the Qi, and strengthening the spleen.[27] By virtue of its blood-nourishing activity, codonopsis may also enhance immunity, relieve fatigue, and improve anaemia.[28]

Schisandra

Schisandra has an extensive history of use in TCM, commonly used to invigorate the Qi of the five viscera, namely the liver, heart, spleen, lung, and kidney.[29] In preclinical studies, schisandra has been shown to reduce serum corticosterone levels, thereby ameliorating stress- related behaviour,[30] and increase resistance to various stressors by protecting against adrenal, thymus, and body weight reductions.[31]

The contemporary applications of schisandra result from studies reporting beneficial effects on exhaustion, fatigue, insomnia, headache, depression, influenza, and pneumonia.[31] Schisandra is often prescribed in combination with additional herbs, particularly Siberian ginseng, and rhodiola for infections and post-viral recovery. In a recent clinical trial, this herbal combination increased physical performance and reduced the duration of fatigue and pain compared to placebo in patients with long-COVID.[32]

Siberian ginseng

Siberian ginseng is often prescribed to improve physical and mental responses during convalescence or fatigue states,[33] and for declining capacity of work or concentration.[34] The immune-modulating effect of Siberian ginseng is thought to involve the activation of immune cells;[35,36] however, there may also be indirect immunoenhancing effects mediated via its effects on the HPA-axis.[37]

A recent review of 46 studies concluded that Siberian ginseng has beneficial effects on cognitive function and physical and mental endurance and portrays promising results as prophylaxis for respiratory system infections.[38] Specifically, in a multi-centre study involving patients with asthenia and chronic stress, Siberian ginseng improved cognitive performance, fatigue, exhaustion, alertness, restlessness, mood, and quality of sleep.[39]

Clinical summary

Astragalus, codonopsis, schisandra, and Siberian ginseng, exert multitarget effects on the neuroendocrine-immune system by triggering adaptive stress responses that have a place in prevention, infection, inflammation, and post-viral recovery.

Full reference list available on request.

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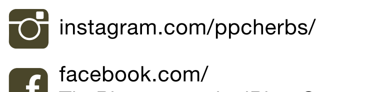

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