

KNOW THE EVIDENCE 2017

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Preface

This edition of the 'Know the Evidence' resource exists as a chapter authored by PJ Klein, PT, EdD and J. Baumgarden, DPT in the text 'Heal Yourself with Qigong' by Master George Picard, Village of Healing and Wellness, St Catharines, ONT, Canada, and is reprinted with their permission.

Picard G. *Heal Yourself with Qigong 2nd ed.* Spiral Graphics:Canada. 2017.
(<http://georgepicard.com>)

INTRODUCTION

'The legitimacy of any health care intervention is grounded by its research evidence.'

While the practice of Qigong dates back millennia, it is only recently that it has received attention within modern Integrative Health Care. As with any intervention considered for adoption within modern health care practice, its legitimacy is judged by the strength of its research evidence. This discussion of the available research through May 2017 assessing health benefits of practice of internal Qigong limits reporting commentary to the most current systematic reviews and meta-analyses as well as key major studies. Systematic reviews and meta-analyses are among the top level of the hierarchy of research evidence. They provide a comprehensive review of all relevant studies on a particular clinical or health-related topic/question. Research agenda follow a familiar pattern. Early preliminary studies provide evidence of feasibility and suggest effect. These small studies provide justification for further research. Larger more rigorous research follows. Once a critical level of evidence is achieved, validation of findings across studies is judged by quantity, quality, and consistency of findings. With the exception of balance training many of the clinical agenda assessing the therapeutic value of Qigong are in early stages of investigation with most studies concluding that further research is needed.

Discussion of the research in this chapter is limited to internal Qigong (also including the practice of Tai chi performed as Qigong). Topics are subcategorized by clinical area. The major source of articles is the database: PubMed, [<http://www.ncbi.nlm.nih.gov/pubmed>]. Additional research information can be found at the Qigong Institute [qigonginstitute.org] the World Tai chi and Qigong Day [www.worldtaichiday.org/], and the National Qigong Association [nqa.org] websites.

INTERNAL QIGONG

Internal qigong is most simply defined as self-regulated energy cultivation (breath work). It is an ancient Chinese mind/body exercise system that integrates postures, breathing techniques, and focused intention. There may be as many Qigong styles and forms as there are Qigong masters, and there is no available evidence to suggest superiority of one form

over all others. Exercise can be dynamic in the form of flowing, mind-body, integrated movement patterns or static in the form of quiet meditation.

A tenet common to both Integrative Health Care and Traditional Chinese Medicine is that while an injury or chronic disorder may be defined as a reductionist pathology, it is the capacity of the whole body including emotional, immunological, and nutritional states that participate in and dictate optimal healing and disease management. There is universal agreement among health professionals that regular exercise is beneficial for maintaining and restoring health. For centuries, Qigong exercise has been prescribed within traditional Chinese medical practice. In recent decades, its popularity as part of healthful living has spread to proponents of Integrative Western Medicine. Therefore, it was not so surprising that authors of an article published in the Harvard Women's Health Newsletter May, 2009, coined the apropos phrase that *tai chi [Qigong] was Medication in Motion*. The only surprise is why did it take so long for the West to come to this epiphany? But then again, maybe not so surprising, as modern medicine evolves from fact validated in scientific research rather than theoretical, empirical or intuitive belief. As such, modern medical practitioners are just beginning to understand what the Chinese have accepted for millennia: *regular practice of Qigong is a true path to health, healing and longevity*. And, it is accessible to everyone: safe, effective, easy to learn, adaptable to level of activity tolerance, and needs no special equipment or expense.

EVOLUTION of RESEARCH EVIDENCE on HEALTH BENEFITS of QIGONG (including tai chi performed as internal qigong exercise for health)

Awareness of the potential benefits of internal qigong and tai chi performed as qigong by practitioners of traditional Western medicine was raised when practices within Traditional Chinese Medicine (TCM) were introduced to the West in the 1970's. However rigorous research evidence of therapeutic effect was slow to emerge in Western research literature. In 2004, Klein and Adams authored a review of the literature through 2003 citing only 17 research studies. These authors concluded that preliminary research on implementation feasibility of Taiji (tai chi) programming existed for a variety of clinical populations.

Klein PJ, Adams WD. Comprehensive therapeutic benefits of Taiji: a critical review. *Am J Phys Med Rehabil.* 2004 Sep;83(9):735-45. Review. PMID: 15314540

Over the next 5 years (2004-2009), through a growing awareness of the need for rigorous study and an expanding availability of research funding, the body of evidence strengthened. In 2010, Jahnke et al published a review of 77 clinical research reports investigating qigong exercise and tai chi performed as qigong exercise concluding that consistent, significant results for a number of health benefits were confirmed through independent, quality research. These researchers also established the equivalency of therapeutic tai chi as qigong exercise. However at that time, many questions of efficacy still remained unanswered, and many clinical areas were, as yet, unexplored.

Jahnke R, Larkey L, Rogers C, Etnier J, Lin F. A comprehensive review of health benefits of qigong and tai chi. *Am J Health Promot.* 2010 Jul-Aug;24(6):e1-e25. doi: 10.4278/ajhp.081013-LIT-248.

In 2015, a group of leading researchers including Dr Guo-Yan Yang and colleagues from the Centre for Evidence-based Chinese Medicine, Beijing University of Chinese Medicine, Beijing, China and Dr. Peter Wayne from the Osher Center for Integrative Medicine, Brigham and Women's Hospital and Harvard Medical School, collaborated to produce the most comprehensive review to date. Over 500 articles were included in the review, including over 250 randomized clinical trials (RCT's). They found a wide range of diseases/conditions such as hypertension, diabetes, osteoarthritis, osteoporosis, breast cancer, heart failure, COPD, coronary heart disease, schizophrenia, and depression addressed in clinical studies. The majority of studies (94.1%) reported positive effects of Tai chi (performed as Qigong). Evidence of benefits of therapeutic tai chi include two major areas physical performance and symptoms of physical well-being. Physical performance includes strength, flexibility, cardiovascular function, balance, pulmonary function, body mass index, biomarkers of immune function and mediation of inflammation. Symptoms challenging well-being include depression, stress, mood, fear of falling, self-efficacy, anxiety, self-esteem, social functioning, and quality of sleep. Of the 105 studies reporting on safety, no serious adverse events related to the practice of Tai chi were reported. These researchers concluded that the quantity and evidence base of clinical studies on Tai chi is substantial. However, there is a wide variation in Tai Chi intervention studied and the reporting of Tai Chi intervention needs to be improved. Further well-designed and reported studies are recommended to confirm the effects of Tai chi for the frequently reported diseases/conditions.

Yang G-Y, Wang L-Q, Ren J, et al. (2015) Evidence Base of Clinical Studies on Tai Chi: A Bibliometric Analysis. Scherer RW, ed. *PLoS ONE*. 2015;10(3):e0120655. doi:10.1371/journal.pone.0120655. Free PMC Article

More recently, medical practitioners at Harvard Medical School touted the health benefits of qigong practiced as Tai chi as a valuable exercise modality in physical rehabilitation. [<https://www.facebook.com/Harvard/videos/10154320765401607/>]

CLINICAL RESEARCH EVIDENCE

The following addresses the evidence base (current through May 2017) assessing therapeutic benefits of Qigong/Tai chi practice by clinical area.

QIGONG and FALL PREVENTION

The strongest evidence base establishing the therapeutic benefit of Qigong/Tai chi practice is in the areas of balance and fall prevention where comparative study has shown this ancient Eastern modality to be equivalent to and in some cases superior to traditional modes of balance training exercise and more cost-effective.

A panel of researchers, led by Dr. Leslie Gillespie, out of New Zealand, updated a Cochrane review first published in 2009. These researchers reviewed 159 trials including 79,193 participants addressing multiple fall prevention interventions. They concluded that engagement in group and home-based exercise programs, and home safety interventions reduce rate of falls and risk of falling. Among exercise programs compared, Tai chi was found to be effective for reducing risk of falling.

Gillespie LD, Robertson MC, Gillespie WJ, Sherrington C, Gates S, Clemson LM, Lamb SE. (2012) Interventions for preventing falls in older people living in the community. Cochrane Database Syst Rev. 2012 Sep 12;9:CD007146. doi: 10.1002/14651858.CD007146.pub3.

Since publication of the Gillespie et al Cochrane review, more studies have confirmed that the practice of Tai chi is effective for fall prevention and considered to be more cost-effective as compared to more traditional exercise programs.

Mat S, Tan MP, Kamaruzzaman SB, Ng CT. Physical therapies for improving balance and reducing falls risk in osteoarthritis of the knee: a systematic review. *Age Ageing*. 2015;44 (1):16-24. DOI: <https://doi.org/10.1093/ageing/afu112>

Song R, Ahn S, So H, Lee EH, Chung Y, Park M. Effects of T'ai Chi on balance: a population-based meta-analysis. *Journal of Alternative and Complementary Medicine*. 2015;21:141-51

Two RCT's investigating effects of tai chi in fall prevention are notable. In 2005, Dr. Fuzong Li, out of Oregon Research Institute, and colleagues reported findings of an RCT involving 256 physically inactive, community-dwelling older adults. They concluded that a 3 x's/wk, 6-month Tai Chi program is effective in decreasing the number of falls, the risk for falling, and the fear of falling, and it improves functional balance and physical performance in physically inactive persons aged 70 years or older.

Li F, Harmer P, Fischer KJ, McAuley E., Chaumelon N, Eckstrom W, Wilson NL. (2005) Tai chi and fall reductions in older adults; a randomized controlled trial. *J Gerontol A Biol Sci Med Sci*. 2005 Feb;60(2):187-94. PMID: 15814861

Additionally in 2013, Dr. Tousignant of Sherbrooke, Quebec and colleagues reported results of an RCT involving 152 frail older adults and found that 15-wks of Tai chi practice was more effective than conventional physical therapy for fall prevention.

Tousignant M, Corriveau H, Roy PM, Desrosiers J, Dubuc N, Hébert R. Efficacy of supervised Tai Chi exercises versus conventional physical therapy exercises in fall prevention for frail older adults: a randomized controlled trial. *Disabil Rehabil*. 2013 Aug;35(17):1429-35. doi: 10.3109/09638288.2012.737084. Epub 2012 Nov 20. PubMed PMID: 23167499.

Also of note, is a cost/benefit analysis of the *Tai chi: Moving for Better Balance* program. This study found the Tai chi: Moving for Better Balance program superior to two well-known traditional exercise and fall prevention education programs (Otago and Stepping On). The return on investment (ROI) for the Tai chi intervention was estimated at 509% for dollar spent.

Carande-Kulis V, Stevens JA, Florence CS, Beattie B, Arias I. (2015) A cost-benefit analysis of three older adult prevention interventions. (2015) *J Safety Res* 52:65-70 doi: 10.1016/j.jsr.2014.12.007. Epub 2015 Jan 6. PMID: 25662884

QIGONG IN CANCER CARE

There is a growing body of evidence confirming the role of Qigong in supportive cancer care.

In 2014, Zeng and colleagues, out of Guangzhou Medical University, published a review of the research addressing Qigong in cancer care. This meta-analysis included 13 RCT's. Nine RCTs were included in pooling of data for meta-analyses. Most studies were small pilot studies. The largest study, conducted by Oh et al, 2010, provided the strongest evidence. The Oh et al study found evidence of effect for outcomes of fatigue, quality of life (QOL) and mediation of inflammation. Zeng and colleagues concluded from their meta-analysis that Qigong /tai chi had positive effects on cancer specific QOL fatigue, immune function and cortisol levels of individuals experiencing cancer. In their discussion, Zeng et al noted that while there is evidence that any exercise benefits those with cancer, there is no evidence that cancer-specific QOL benefits are found with traditional Western exercise; this finding is unique to the Eastern exercise of Qigong /Tai chi.

Zeng Y, Luo T, Xie H, Huang M, Cheng AS. Health benefits of Qigong or tai chi for cancer patients: a systematic review and meta-analyses. *Complement Ther Med*. 2014 Feb;22(1):173-86. doi: 10.1016/j.ctim.2013.11.010. Epub 2013 Dec 18. Review. PubMed PMID: 24559833.

In 2016, Klein et al independently validated the conclusions of Zeng and colleagues analyzing 11 Qigong studies and conducting a construct analysis on content and logistics of their evidence-based programming. Qigong exercise was found to be effective in supportive care to address cancer-related quality of life. Multiple modes of Qigong were included, and Qigong exercise, meditation, and self-massage were found to be essential therapeutic elements of practice.

Klein PJ, Schneider R, Rhoads CJ. (2016) Qigong in cancer care: a systematic review and construct analysis of Qigong therapy. *Support Care Cancer* 24(7), 3209-22. doi: 10.1007/s00520-016-3201-7. Epub 2016 Apr 5. Review. PubMed PMID: 27044279.

Among the many studies addressing Qigong in cancer care, several researchers substantiate the role of Qigong in cancer care.

Campo RA, Light KC, O'Conner K, et al (2015) Blood pressure, salivary cortisol, and inflammatory cytokine outcomes in senior female cancer survivors enrolled in a tai chi chih randomized controlled trial. *J Cancer Surviv* 9(1):115-25. doi: 10.1007/s11764-014-0395-x. Epub 2014 Aug 28 PMID: 25164513

Campo RA, Agarwal N, LaStayo PC, O'Connor K, Pappas L, Boucher KM, Gardner J, Smith S, Light KC, Kinney AY. (2014) Levels of fatigue and distress in senior prostate cancer survivors enrolled in a 12-week randomized controlled trial of Qigong. *J Cancer Surviv*. 2014 Mar;8(1):60-9. doi: 10.1007/s11764-013-0315-5. Epub 2013 Oct 30. PubMed PMID: 24170679; PubMed Central PMCID: PMC3945387. Free PMC Article

Chen Z, Meng Z, Milbury K, Bei W, Zhang Y, Thornton B, Liao Z, Wei Q, Chen J, Guo X, Liu L, McQuade J, Kirschbaum C, Cohen L (2013) Qigong improves quality of life in women undergoing radiotherapy for breast cancer: results of a randomized clinical trial. *Cancer* 119(9):1690-8. doi: 10.1002/cncr.27904. Epub 2013 Jan 25. PubMed PMID: 23355182; PubMed Central PMCID: PMC3852682 Free PMC Article

Irwin, Olmstead, Breen et al (2014) Tai chi, cellular inflammation, and transcriptome dynamics in breast cancer survivors with insomnia. *J Natl Cancer Inst Monogr* 2014(50):295-301. doi: 10.1093/jncimonographs/lgu028

Lam, SWY (2004) A randomized, controlled trial of Guolin qigong in patients receiving transcatheter arterial chemoembolisation for unresectable hepatocellular carcinoma, Masters dissertation Hong Kong, China, The University of Hong Kong

Larkey LK, Roe DJ, Weihs KL, Jahnke R, Lopez AM, Rogers CE, Oh B, Guillen-Rodriguez J (2015) Randomized Controlled Trial of Qigong/Tai Chi Easy on Cancer-Related Fatigue in Breast Cancer Survivors. *Annals of Behavioral Medicine* 49(2):165-176

Liu P, You J, Sun Y, He Y, Sit H, Jia L, Wong M, Xia Z, Zheng X, Wang Z, et al. the efficacy of Guolin-Qigong on the mind-body health of Chinese women with breast cancer: a randomized controlled trial. *Qual Life Res.* 2017 Apr 18; Apr 18. doi: 10.1007/s11136-017-1576-7. [Epub ahead of print] PMID: 28421384

Loh SY, Lee SY, Murray L (2014) The Kuala Lumpur Qigong trial for women in cancer survivorship phase-efficacy of a three-arm RCT to improve QOL. *Asian Pac J Cancer Prev* 15(19):8127-34. PMID: 25338995 Free Article

Oh B, Butow PN, Mullan BA, Clarke SJ, Beale PJ, Pavlakis N, Lee MS, Rosenthal DS, Larkey L, Vardy J (2012) Effect of medical Qigong on cognitive function, quality of life, and a biomarker of inflammation in cancer patients: a randomized controlled trial. *Support Care Cancer* 20(6):1235-42. doi: 10.1007/s00520-011-1209-6. Epub 2011 Jun 19. PubMed PMID: 21688163.

Oh B, Butow P, Mullan B, Clarke S, Beale P, Pavlakis N, Kothe E, Lam L, Rosenthal D (2010) Impact of medical Qigong on quality of life, fatigue, mood and inflammation in cancer patients: a randomized controlled trial. *Ann Oncol* 21(3):608-14. doi: 10.1093/annonc/mdp479. Epub 2009 Oct 30. Free PMC Article

Oh B, Butow P, Mullan B, Clarke S, Beale P, Pavlakis N, Kothe E, Lam L, Rosenthal D (2010) Impact of medical Qigong on quality of life, fatigue, mood and inflammation in cancer patients: a randomized controlled trial. *Ann Oncol* 21(3):608-14. doi: 10.1093/annonc/mdp479. Epub 2009 Oct 30. Free PMC Article

NOTE: An overview of Qigong practice in cancer care can be found in a recent article: Klein PJ. Qigong in Cancer Care: Theory, Evidence-base, and Practice [available online at www.mdpi.com/2305-6320/4/1/2.]

QIGONG AND CARDIAC REHABILITATION AND CARDIOVASCULAR CONDITIONS

Tai chi has been shown to be effective for management of hyperlipidemia and high blood pressure when combined with medication. It is also considered a complementary or alternative exercise for cardiac rehabilitation, especially for individuals with significant cardiac impairment. The following studies are a small sample of the available research in this common clinical area.

Pan XH, Mahemuti A, Zhang XH, Wang YP, Hu P, Jiang JB, Xiang MX, Liu G, Wang JA. Effect of Tai Chi exercise on blood lipid profiles: a meta-analysis of randomized controlled trials. *J Zhejiang Univ Sci B*. 2016 Aug;17(8):640-8. doi: 10.1631/jzus.B1600052. PMID: 27487809 Free PMC Article

Gu Q, Wu SJ, Zheng Y, Zhang Y, Liu C, Hou JC, Zhang K, Fang XM. Tai Chi Exercise for Patients with Chronic Heart Failure: A Meta-analysis of Randomized Controlled Trials. *Am J Phys Med Rehabil*. 2017 Feb 23. doi: 10.1097/PHM.0000000000000723. [Epub ahead of print] PMID: 28234634

Nery RM, Zanini M, Ferrari JN, et al. (2014) Tai Chi Chuan for Cardiac Rehabilitation in Patients with Coronary Arterial Disease. *Arquivos Brasileiros de Cardiologia*. 2014;102(6):588-592. doi:10.5935/abc.20140049.

Wang XQ, Pi YL, Liu Y, et al. Traditional Chinese Exercise for Cardiovascular Diseases: Systematic Review and Meta-Analysis of Randomized Controlled Trials. *J Am Heart Assoc*. 2016 Mar 9;5(3):e002562. doi: 10.1161/JAHA.115.002562.

IMMUNE SUPPORT and MEDIATION of INFLAMMATION

The practice of qigong has known beneficial therapeutic effects on immune support and mediation of inflammation. The following highlights two key studies from the body of research addressing immune support and mediation of inflammation.

In 2016, a small study by Niu contributed to our understanding of mechanisms of action. The study investigated effect of "tai chi" exercise on antioxidant enzymes activities and immunity function in participants. Participants were randomly divided into two groups: Tai chi exercise group (n=25) and control group (n=25). Participants in the "tai chi" group performed Tai chi exercise for 1 hr every day. Participants in the control group did not perform Tai chi. Study duration was 6 mos. Results revealed that Tai chi exercise increased antioxidant enzymes activities and improve immunity function in participants. Niu concluded that Tai chi exercise is useful for maintaining health.

Niu A. Effect of "tai chi" exercise on antioxidant enzymes activities and immunity function in middle-aged participants. *Afr J Tradit Complement Altern Med*. 2016 Aug 12;13(5):87-90. doi: 10.21010/ajtcam.v13i5.12. eCollection 2016. PMID: 28487898

In 2014, Irwin, out of UCLA, and colleagues published a report of a study investigating the effect of Tai Chi Chih (TCC) on systemic, cellular, and genomic markers of inflammation as compared with cognitive behavioral therapy for insomnia (CBT-I). 90 breast cancer survivors with insomnia were assigned to TCC or CBT-I for 2-hour sessions weekly for 3

months. At baseline and postintervention, blood samples were obtained for measurement of C-reactive protein and toll-like receptor-4-activated monocyte production of interleukin-6 (IL-6) and tumor necrosis factor- α (TNF), with a random subsample (n = 48) analyzed by genome-wide transcriptional profiling.

Study results demonstrated that levels of C-reactive protein did not change in the TCC and CBT-I groups. Levels of toll-like receptor-4-activated monocyte production of IL-6 and TNF combined showed an overall reduction in TCC versus CBT-I ($P < .02$), with similar effects for IL-6 ($P = .07$) and TNF ($P < .05$) alone. For genome-wide transcriptional profiling of circulating peripheral blood mononuclear cells, expression of genes encoding proinflammatory mediators showed an overall reduction in TCC versus CBT-I ($P = .001$). TELiS promoter-based bioinformatics analyses implicated a reduction of activity of the proinflammatory transcription factor, nuclear factor- κ B, in structuring these differences.

In analysis of findings, investigators concluded that among breast cancer survivors with insomnia, 3 months of TCC reduced cellular inflammatory responses, and reduced expression of genes encoding proinflammatory mediators. Given the link between inflammation and cancer, these findings provide an evidence-based molecular framework to understand the potential salutary effects of TCC on cancer survivorship.

Irwin MR, Olmstead R, Breen EC, et al. Tai chi, cellular inflammation, and transcriptome dynamics in breast cancer survivors with insomnia: a randomized controlled trial. *J Natl Cancer Inst Monogr*. 2014 Nov;2014(50):295-301. doi: 10.1093/jncimonographs/lgu028.

QIGONG and CHRONIC OBSTRUCTIVE LUNG DISEASE (COPD)

There is a growing body of evidence supporting use of Qigong in management of COPD. A recent review validated findings of previous studies.

Wu and colleagues, from Department of Sports Medicine, Shanghai University of Sport, Shanghai, conducted a systematic review of 11 studies involving 824 patients. These researchers concluded that Tai Chi has beneficial effects on exercise capacity and HRQoL in COPD patients, and that this exercise can be recommended as an effective alternative training modality in pulmonary rehabilitation programs.

Wu W, Liu X, Wang L, Wang Z, Hu J, Yan J. Effects of Tai Chi on exercise capacity and health-related quality of life in patients with chronic obstructive pulmonary disease: a systematic review and meta-analysis. *International Journal of Chronic Obstructive Pulmonary Disease*. 2014;9:1253-1263. doi:10.2147/COPD.S70862.

QIGONG for PAIN, ARTHRITIC AND MUSCULOSKELETAL CONDITIONS

While the current body of research addressing therapeutic effect of Qigong is evolving, there is sufficient evidence to warrant authoritative clinical practice recommendations and justification for further study.

Recently, the American College of Physicians (ACP) developed clinical recommendations on noninvasive treatment of low back pain. The target audience for this guideline includes all

clinicians, and the target patient population includes adults with acute, subacute, or chronic low back pain.

Recommendation 1

Given that most patients with acute or subacute low back pain improve over time regardless of treatment, clinicians and patients should select nonpharmacologic treatment with superficial heat (moderate-quality evidence), massage, acupuncture, or spinal manipulation (low-quality evidence). If pharmacologic treatment is desired, clinicians and patients should select nonsteroidal anti-inflammatory drugs or skeletal muscle relaxants (moderate-quality evidence). (Grade: strong recommendation).

Recommendation 2

For patients with chronic low back pain, clinicians and patients should initially select nonpharmacologic treatment with exercise, multidisciplinary rehabilitation, acupuncture, mindfulness-based stress reduction (moderate-quality evidence), **tai chi**, yoga, motor control exercise, progressive relaxation, electromyography biofeedback, low-level laser therapy, operant therapy, cognitive behavioral therapy, or spinal manipulation (low-quality evidence). (Grade: strong recommendation).

Qaseem A, Wilt TJ, McLean RM, Forciea MA, Noninvasive Treatments for Acute, Subacute, and Chronic Low Back Pain: A Clinical Practice Guideline From the American College of Physicians. Clinical Guidelines Committee of the American College of Physicians. Clin Rehabil. 2017 May;31(5):582-595. doi: 10.1177/0269215517691083. Epub 2017 Feb 9.

Similarly, the Ottawa panel clinical practice guidelines for the management of knee osteoarthritis listed Tai Chi/Qigong as a recommended mind/body practice concluding that for pain management, enhancement of quality of life and physical function for individuals mind-body exercises are promising approaches to reduce pain, as well as to improve physical function and quality of life for individuals with knee osteoarthritis.

Brosseau L, Taki J, Desjardins B, et al. The Ottawa panel clinical practice guidelines for the management of knee osteoarthritis. Part one: introduction and mind body exercise programs. Clin Rehabil. 2017 May;31(5):582-595. doi: 10.1177/0269215517691083. Epub 2017 Feb 9. PMID: 28183188

In 2016, Wang et al reported results of a randomized, 52-week, single-blind comparative effectiveness trial (ClinicalTrials.gov: [NCT01258985](https://clinicaltrials.gov/ct2/show/study/NCT01258985)) conducted in an urban tertiary care academic hospital. Participants (N=204) with symptomatic knee osteoarthritis (mean age, 60 years; 70% women; 53% white) practiced Tai Chi (2 times-per-week for 12 weeks) or standard physical therapy (2 times-per-week for 6 weeks, followed by 6 weeks of monitored home exercise). These researchers concluded that Tai Chi produced beneficial effects similar to those of a standard course of physical therapy in the treatment of knee osteoarthritis.

Wang J, Schmid CH, Iversen MD, et al. Comparative Effectiveness of Tai Chi Versus Physical Therapy for Knee Osteoarthritis: A Randomized Trial. Ann Intern Med. 2016 Jul 19;165(2):77-86. doi: 10.7326/M15-2143. Epub 2016 May 17.

In 2017, a report of a randomized clinical trial (RCT) conducted by Lauche et al

summarized existing research stating that Tai Chi and neck exercises significantly improved chronic non-specific neck pain. In their primary research, subjects with chronic non-specific neck pain were randomly assigned to 12 weeks of group Tai Chi or conventional neck exercises, and they attended 12 weekly sessions of 60-90 minutes. The interventions included exercises to improve body awareness, i.e. interoceptive and postural awareness. These researchers concluded that neck pain improvement was significantly associated with changes in postural awareness in subject with chronic non-specific neck pain independent of treatment characteristics. Training of postural awareness might be an important mechanism of action of different exercise-based interventions for chronic neck pain.

Lauche R, Wayne PM, Fehr I, Stumoe C, Dobos G, Cramer, H. Does Postural Awareness Contribute to Exercise-induced Improvements in Neck Pain Intensity? A Secondary Analysis of a Randomized Controlled Trial Evaluating Tai Chi and Neck Exercises.

In contrast to the research reported in the previous, a recent systematic review on this topic presented conflicting conclusions. Hall and colleagues conclude that there was not sufficient rigorous study to support practice recommendations for use of tai chi/qigong in treatment of chronic musculoskeletal pain conditions.

Hall A, Copsey B, Rishmond H, Thompson M, Latimer J, Maher CG. [Effectiveness of Tai Chi for Chronic Musculoskeletal Pain Conditions: Updated Systematic Review and Meta-Analysis](#). Phys Ther. 2017 Feb 1;97(2):227-238. doi: 10.2522/ptj.20160246. PMID:27634919

QIGONG and COGNITION

A panel of researchers, led by Dr. Peter Wayne of the Osher Center for Integrative Medicine, reviewed 20 studies including 2,553 participants and concluded that Tai Chi shows potential to enhance cognitive function in older adults, particularly in the realm of executive functioning and in individuals without significant impairment. They concluded that larger and methodologically sound trials with longer follow-up periods are needed before more-definitive conclusions can be drawn.

Wayne PM, Walsh JN, Taylor-Piliae RE, [...] Yeh GY. (2014) The Impact of Tai Chi on Cognitive Performance in Older Adults: A Systematic Review and Meta-Analysis. *Journal of the American Geriatrics Society*. 2014;62(1):25-39. doi:10.1111/jgs.12611

Taylor-Piliae RE, Newell KA, Cherin R, Lee MJ, King AC, Haskell WL. Effects of Tai Chi and western exercise on physical and cognitive functioning in healthy community-dwelling older adults. *J. Aging Phys. Act.* 2010;18(3):261-279. [[PMC free article](#)] [[PubMed](#)]

QIGONG FOR FATIGUE

Fatigue is not only a familiar symptom in our daily lives, but also a common ailment that affects all of our bodily systems. Several randomized controlled trials (RCTs) have proven Tai Chi to be beneficial for patients suffering from fatigue, however conclusive evidence is

still lacking.

A recent systematic review suggest that Tai Chi could be an effective alternative and /or complementary approach to existing therapies for people with fatigue. However, the quality of the evidence was only moderate and may have the potential for bias. There is still absence of adverse events data to evaluate the safety of Tai Chi. Further multi-center RCTs with large sample sizes and high methodological quality, especially carefully blinded design, should be conducted in future research.

Xiang Y, lu L, Chen, Wen. Does Tai Chi relieve fatigue? A systematic review and meta-analysis of randomized controlled trials. *PLoS One*. 2017 Apr 5;12(4):e0174872. doi: 10.1371/journal.pone.0174872. eCollection 2017.

QIGONG and FIBROMYALGIA

There are several small, conflicting studies in the area of Qigong in management of fibromyalgia. However a recent large, well-controlled study found positive results for quality of life outcomes.

In 2012, Dr. R. Lauche, of the University of Duisburg-Essen, Germany, and colleagues reviewed the literature and found 7 topic-related trials. They concluded that while Qigong may be a useful approach in the management of fibromyalgia, there was no strong evidence, at that time, to support superiority of Qigong as compared to conventional active treatments.

Lauche R, Cramer H, Häuser W, Dobos G, Langhorst J. (2013) A Systematic Review and Meta-Analysis of Qigong for the Fibromyalgia Syndrome. *Evidence-based Complementary and Alternative Medicine : eCAM*. 2013;2013:635182. doi:10.1155/2013/635182.

In more recent controlled study, conducted in Italy, Maddali Bongi et al concluded that in individuals with fibromyalgia, Qigong/Tai chi quan programming, if administered by an expert physiotherapist, should be regarded as an effective rehabilitation method.

Maddali Bongi S, Paoletti G, Calà M, et al. Efficacy of rehabilitation with Tai Ji Quan in an Italian cohort of patients with Fibromyalgia Syndrome. *Complement Ther Clin Pract*. 2016 Aug;24:109-15. doi: 10.1016/j.ctcp.2016.05.010. Epub 2016

Lynch et al found positive results for effectiveness of qigong and management of fibromyalgia. In post hoc analysis of Chaoyi Fanhuan Qigong exercise compliance in an RCT of 100 individuals with fibromyalgia [22]. Those who practiced per protocol (≥ 5 times/wk) had significantly greater improvement than those who practiced minimally (≤ 3 times/wk). This latter finding is important information about dose response.

Lynch M, Sawynok J, Hiew C, Marcon D. A randomized controlled trial of qigong for fibromyalgia. *Arthr Res Ther*. 2012;14:R178 DOI: 10.1186/ar3931

QIGONG IN PARKINSONS DISEASE

Qigong (practiced as Tai chi) when combined with medication has been shown to improve motor function, balance and well-being in individuals with Parkinsons disease.

In 2015, Zhou and colleagues reviewed the existing research evaluating the therapeutic effect of Tai chi in the management of Parkinson's disease (PD). They concluded that Tai Chi can significantly improve motor function and balance in individuals with PD. They further judged that there is not enough confirming evidence to definitively state that Tai Chi is effective for management of PD because of the small treatment effect, methodological flaws of eligible studies, and insufficient follow-up within studies.

Zhou J, Yin T, Gao Q, Yang XC. (2015) A Meta-Analysis on the Efficacy of Tai Chi in Patients with Parkinson's Disease between 2008 and 2014. *Evidence-based Complementary and Alternative Medicine : eCAM*. 2015;2015:593263. doi:10.1155/2015/593263.

Similarly in 2017, Cwiekata-Lewis et al concluded from a comprehensive search of the available research that current medical treatments for Parkinson's disease (PD) are mainly palliative, though research indicates Tai Chi exercise improves physical function and well-being in individuals with PD. These researchers further concluded that additional research is needed before widespread recommendations can be made.

Ćwiękała-Lewis KJ, Gallek M, Taylor-Piliae RE. The effects of Tai Chi on physical function and well-being among persons with Parkinson's Disease: A systematic review. *J Bodyw Mov Ther*. 2017 Apr;21(2):414-421. doi: 10.1016/j.jbmt.2016.06.007. Epub 2016 Jun 16.

QIGONG AND MULTIPLE SCLEROSIS

Individuals with Multiple Sclerosis can improve balance, gait and flexibility and lessen fatigue and depression, and better quality of life through the practice of qigong (performed as Tai chi).

A 2017 review of 8 research studies concluded that overall, participants enrolled in Tai Chi had better balance, gait and flexibility, less fatigue and depression, and better quality of life after the intervention; though mixed results were reported. The results indicate that Tai Chi is likely safe and may provide physical and psychosocial benefits in individuals with Multiple Sclerosis. Though further research is needed using more rigorous study designs to assess the benefits of Tai Chi for individuals with Multiple Sclerosis.

Taylor E, Taylor-Piliae RE. The effects of Tai Chi on physical and psychosocial function among persons with multiple sclerosis: A systematic review. *Complement Ther Med*. 2017 Apr;31:100-108. doi: 10.1016/j.ctim.2017.03.001. Epub 2017 Mar 2.

QIGONG ASSOCIATED with PRIMARY PREVENTION OF STROKE

Population studies are currently assessing the role of Qigong practice in stroke prevention.

In a large systematic review out of China, a panel of researchers reviewed 36 studies with a total of 2393 participants and concluded that Tai chi chuan exercise was associated with lowering of risk factors for stroke. They further concluded that, while promising, the evidence was somewhat lacking in rigor.

Zheng G, Huang M, Liu F, Li S, Tao J, Chen L. (2015) Tai Chi Chuan for the Primary Prevention of Stroke in Middle-Aged and Elderly Adults: A Systematic Review. *Evidence-*

based Complementary and Alternative Medicine : eCAM. 2015;2015:742152.
doi:10.1155/2015/742152.

QIGONG and MOOD, SENSE of WELL-BEING, and MENTAL HEALTH

There is a relatively large body of evidence suggesting the potential benefits of Qigong practice with regard to enhancing sense of well being, mediating depression and complementary treatment of addictions and mental disorders.

In a large systematic review including 21 studies, Jiang et al concluded that many positive effects of Tai Chi practice on mood and anxiety were found in different clinical trials. Despite this evidence, they advised that clinicians should be aware of the limitations due to incomplete understanding of Tai Chi as an intervention. Better evidence and stronger clinical trial designs are needed to further investigate Tai Chi's role in improving mental health.

Jiang D, Kong W, Jiang JJ. The Role of Tai Chi in Mental Health Management-Lessons Learned from Clinical Trials. *Rev Recent Clin Trials.* 2016;11(4):324-332.

QIGONG and DIABETES

Similar to research investigating the role of Qigong in management of fibromyalgia, study results investigating Qigong and diabetes are also conflicted. However, a recent, well conducted study found positive results. Chan et al in an RCT of 150 women with chronic fatigue syndrome found that the number of Baduanjin Qigong lessons attended and the amount of Qigong self-practice were significantly associated with sleep, fatigue, anxiety, and depressive symptom improvement. Again similar to the Lynch et al study, a significant finding in this study confirms a dose response.

Chan JSM, Ho RTH, Chung F-f, Wang C-w, Yao T-w, Ng S-n, Chan CLW. Qigong Exercise Alleviates Fatigue, Anxiety, and Depressive Symptoms, Improves Sleep Quality, and Shortens Sleep Latency in Persons with Chronic Fatigue Syndrome-Like Illness. *Evid Based Complement Alternat Med.* Volume 2014;Article ID 106048,<http://dx.doi.org/10.1155/2014/106048> (viewed 7 July 2017)

AREAS of SPARSE or NO RESEARCH

The research is conflicted in the area of management of diabetes with larger well-controlled studies needed. There are many clinical areas where investigation into therapeutic effects of Qigong are sparse or non-existent. These include management or rehabilitation of head injury, congenital and acquired neurological and developmental disorders, autism, burns, multiple trauma, pre-op/post op care, etc. While there research suggests promise in supportive management of many clinical conditions areas, for now, in areas where research is sparse, the judicious response to public inquiry as to specific benefits is to respond: *“Try it and judge for yourself”*.

Future Research

While basic science and clinical research will continue to reveal the how and why of the therapeutic effects of Qigong, new challenges in applied research emerge. For example, content and time utilization within Qigong for supportive cancer care programming for individuals in active cancer treatment is likely to be distinctly different from community fall

prevention programming for healthy aging seniors. It is feasible to believe that within the next five years a framework of best practice for structure and content of Qigong programming as distinct by clinical area of application will be established.

CONCLUSIONS

Over the past decade, research evidence of Qigong as complementary or alternative health care has grown exponentially such that interest in Qigong has shifted from a curiosity to one of legitimacy within integrative health care. Clinical areas with strongest evidence base to validate clinical application are balance and fall prevention, cancer care, support in cardiac care and COPD. There is moderate-level evidence to validate Qigong practice as complementary in management of Parkinsons disease. Benefits of Qigong practice observed in study of clinical populations include improved sleep, vitality, mood and sense of well being, functional performance, balance and fall prevention, cognition, cardiovascular and pulmonary function, DNA repair, immune support and mediation of inflammation, and management of pain and chronic conditions. In summary, this research supports the statement that Qigong is a path to health, healing, and longevity through healthful ageing.