The Roles of Integrative Medicine in Controlling Cardiometabolic Risk Factors in the Elderly





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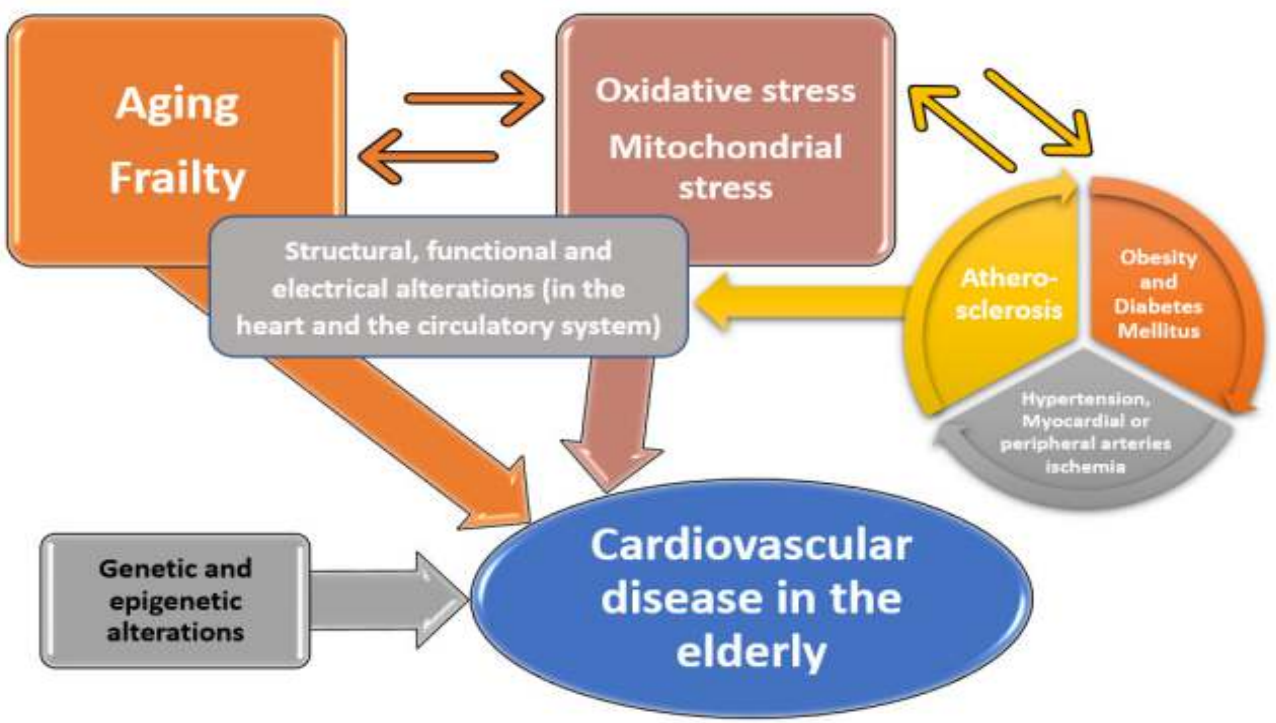
Outline

- Aging & Metabolic Disorders
- Sarcopenia & Metabolic disorders
- Therapeutic Approaches to control cardiometabolic disorders
- WHO strategies & Traditional medicine
- Complementary therapies to control sarcopenia
- Complementary therapies to control cardiometabolic disorders
- Centers for integrative medicine
- Conclusion

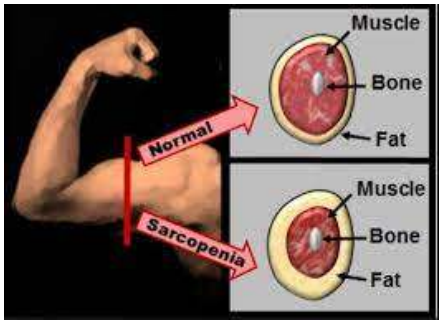
Aging & Metabolic Disorders



Ciumărnean, L., et al. (2021). Cardiovascular risk factors and physical activity for the prevention of cardiovascular diseases in the elderly. *International Journal of Environmental Research and Public Health*, *19*(1), 207.

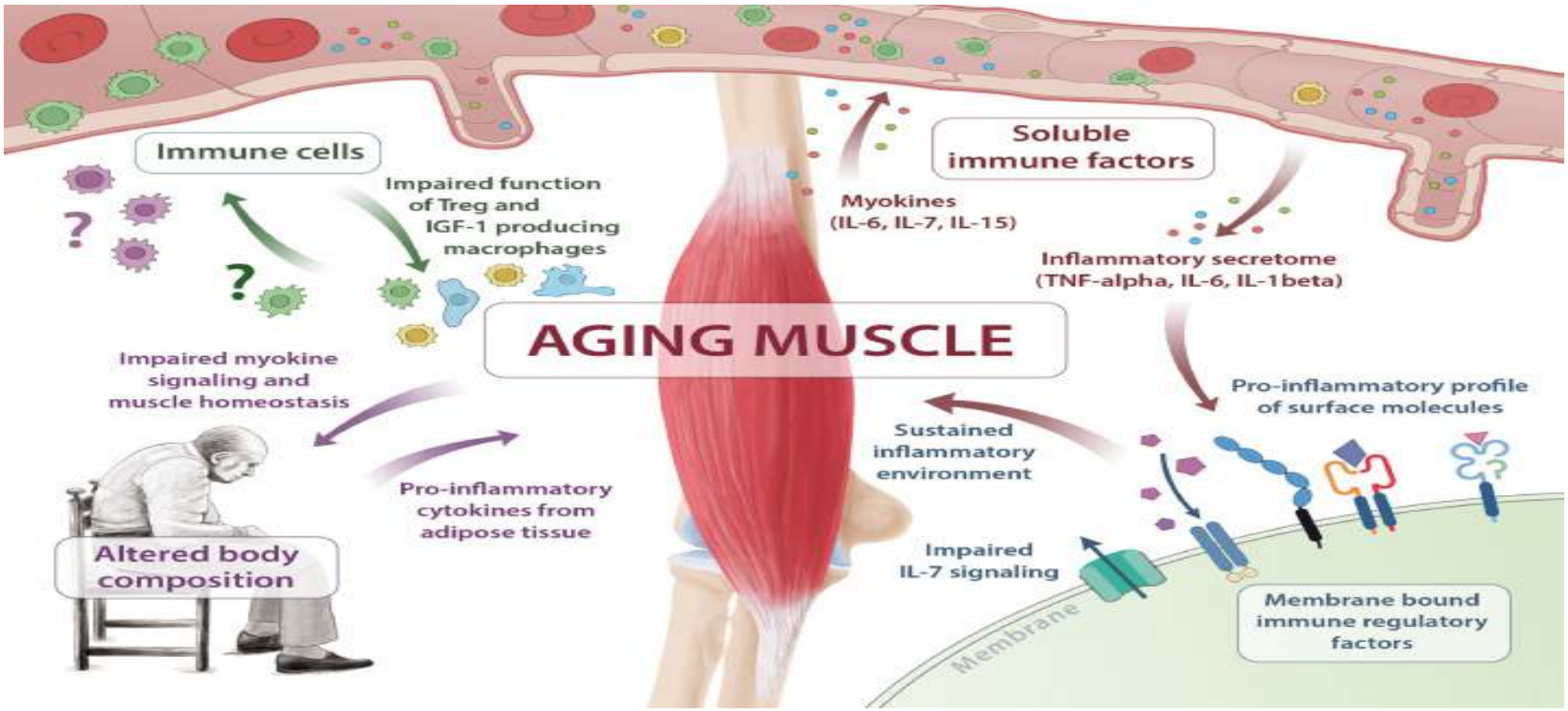
Sarcopenia & Frailty

- Sarcopenia: The loss of muscle mass and function
- Frailty: multi-system impairment associated with increased vulnerability to stressors.
- An overlap between the two conditions, especially in terms of the physical aspects of the frailty phenotype: low grip strength, gait speed and muscle mass



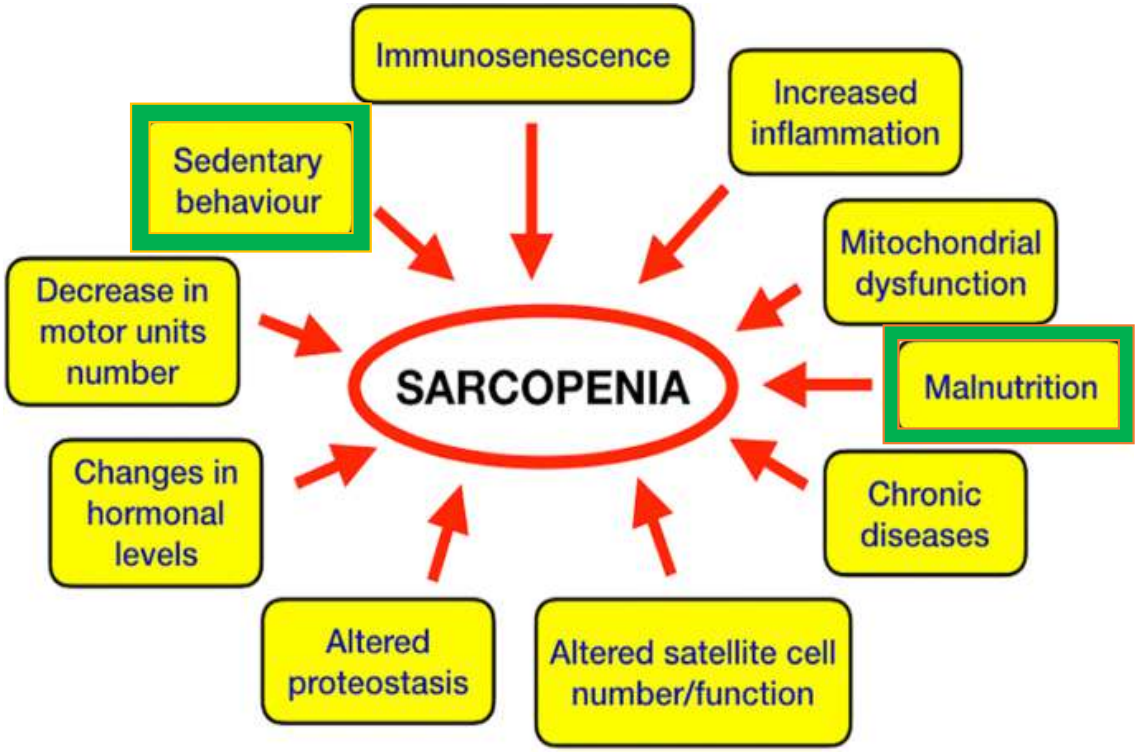
Dodds, R., & Sayer, A. A. (2016). Sarcopenia and frailty: new challenges for clinical practice. *Clinical medicine*, *16*(5), 455.

Sarcopenia & Metabolic disorders



Nelke, C., Dziewas, R., Minnerup, J., Meuth, S. G., & Ruck, T. (2019). Skeletal muscle as potential central link between sarcopenia and immune senescence. *EBioMedicine*, *49*, 381-388.

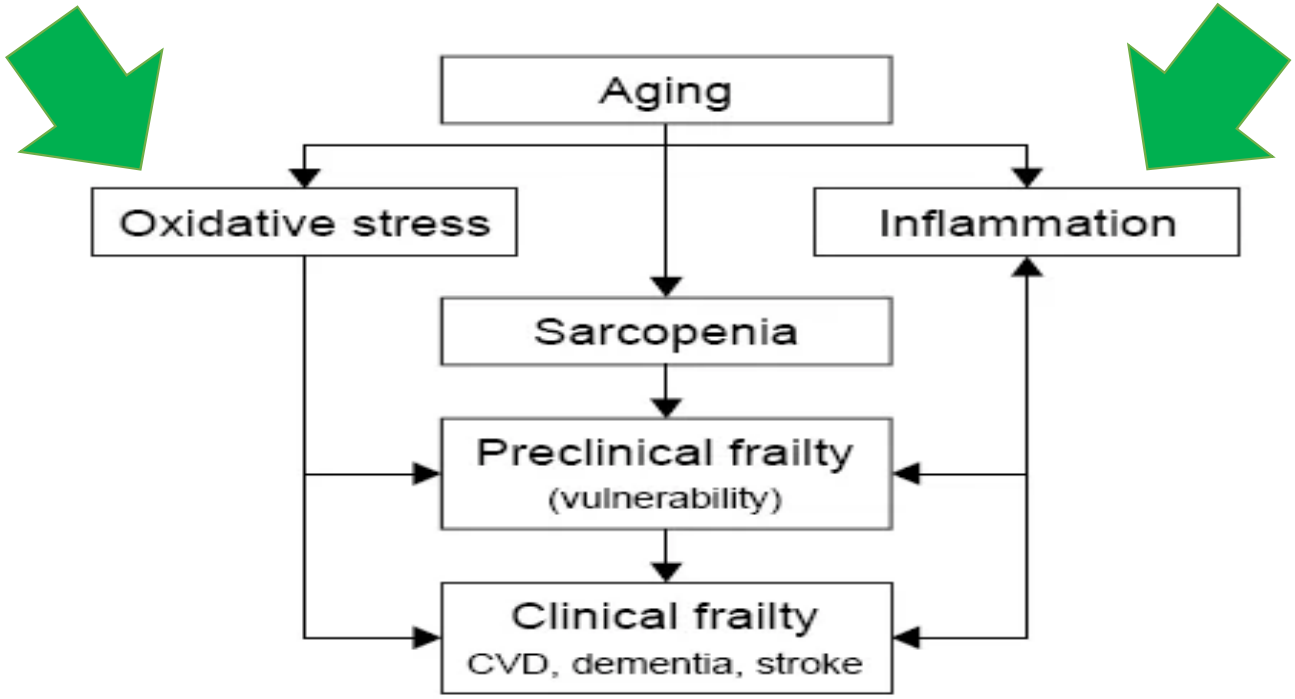
Risk factors for Sarcopenia



Di Filippo, E. S., Bondi, D., Pietrangelo, T., Fanò-Illic, G., & Fulle, S. (2020). Molecular and cellular aspects of sarcopenia, muscle healthy aging and physical conditioning in the elderly. *Journal of Science in Sport and Exercise*, *2*(3), 246-257.

Therapeutic Approaches

Conventional medicine, Traditional & Complementary medicine



Liguori, I., Russo, G., Curcio, F., Bulli, G., Aran, L., Della-Morte, D., ... & Abete, P. (2018). Oxidative stress, aging, and diseases. *Clinical interventions in aging*, *13*, 757.

Traditional & Complementary Medicine

- Some traditional therapeutic interventions are widely used in different parts of the world from antiquity

- In traditional and Islamic medicine texts, many plant-based medications are recommended

- Many In-vitro tests, animal studies, and clinical trials have examined the effectiveness of such plant-based medications

Fallah Huseini, H., Fakhrzadeh, H., **Larijani, B**., & Shikh Samani, A. H. (2006). Review of anti-diabetic medicinal plant used in traditional medicine. Journal of Medicinal Plants, 1(17), 1-8.

WHO strategies

- WHO Traditional Medicine Strategy 2014–2023:

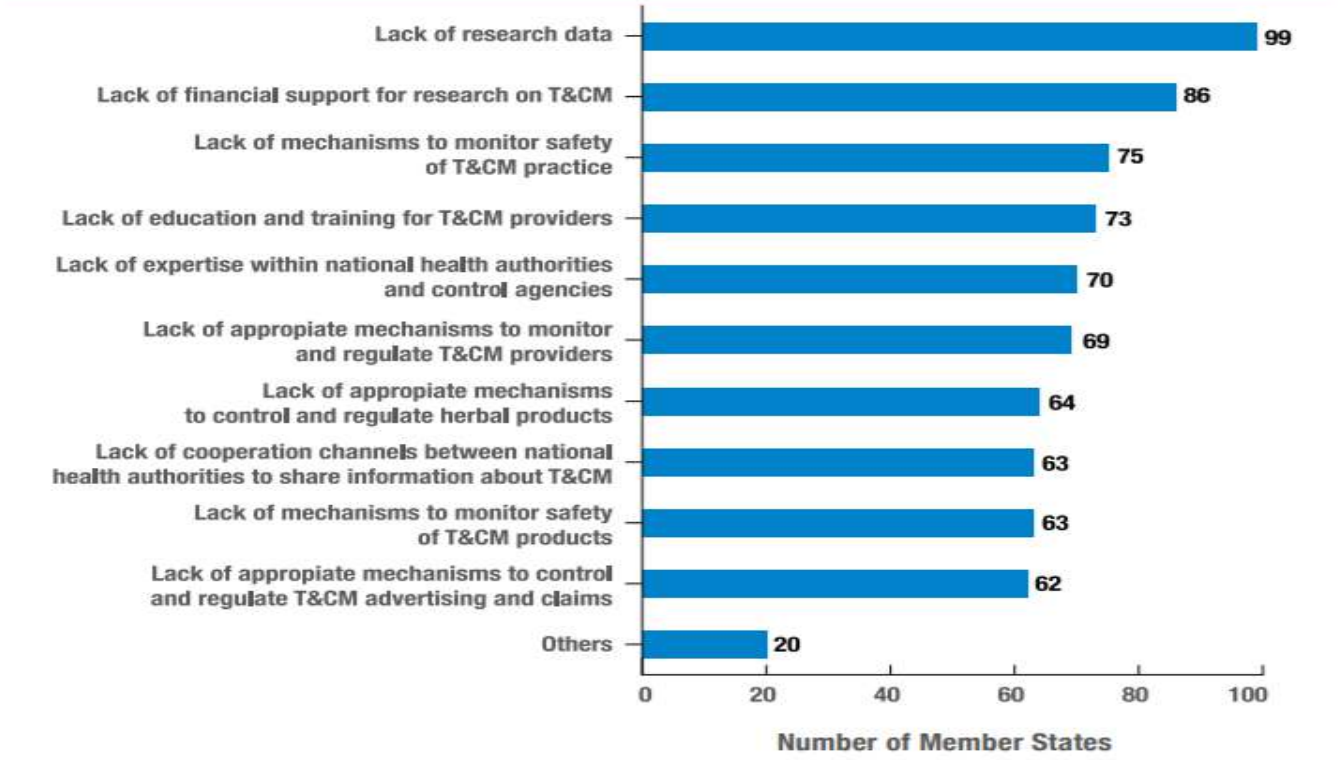
✓To promote the safety, quality and effectiveness of T&CM.

✓Take steps for the appropriate integration of T&CM into health systems (particularly health services) by:

- Developing national policies
- Regulatory frameworks and strategic plans for T&CM products, practices and practitioners.

WHO global report on traditional and complementary medicine. Available at:https://www.who.int/traditional-complementary integrativemedicine/WhoGlobalReportOnTraditionalAndComplementaryMedicine2019.pdf

Difficulties faced by member states



Source: Based on the second WHO global survey respondents only (N=133).

Note: This graph differs from the equivalent graph in the WHO Traditional Medicine Strategy 2014–2023. Upon verification, some discrepancies were found in the interim data of the strategy and those data have been corrected here.

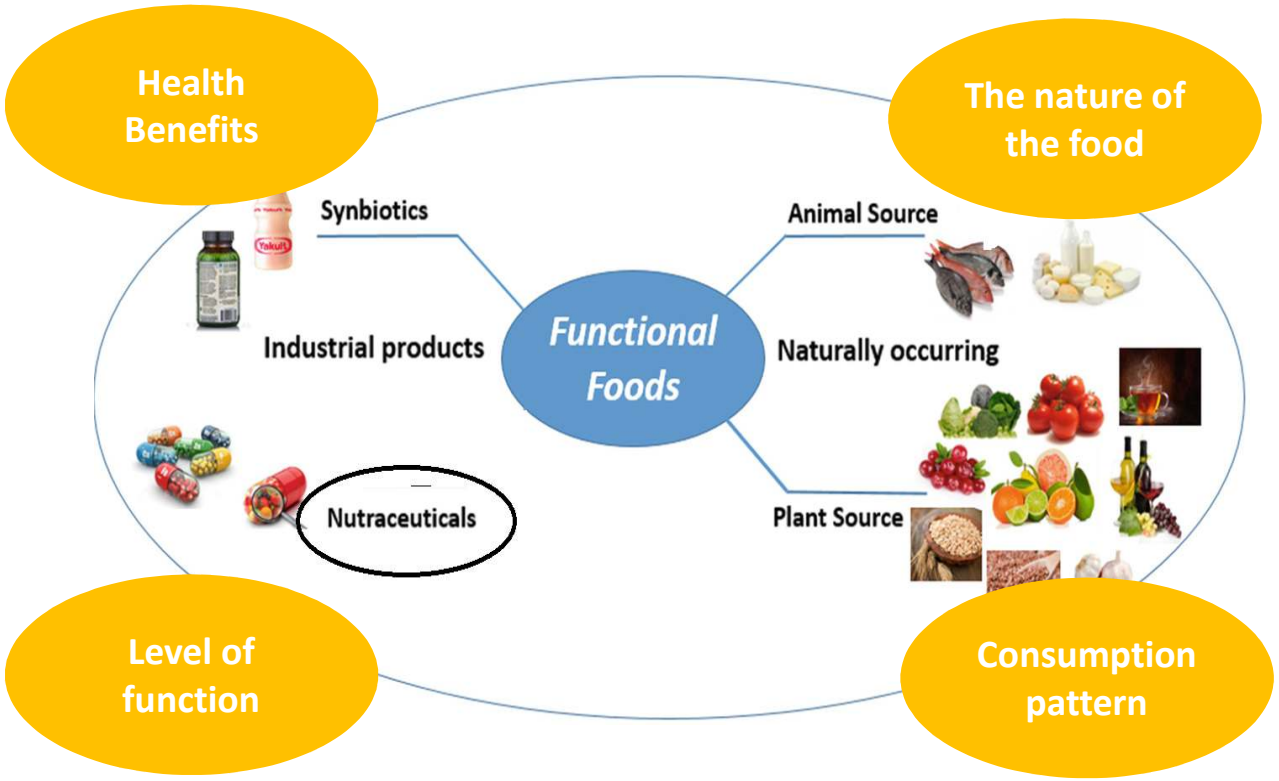
WHO global report on traditional and complementary medicine. Available at:https://www.who.int/traditional-complementary-integrative-medicine/WhoGlobalReportOnTraditionalAndComplementaryMedicine2019.pdf

Nutrition & Health

Let food be thy medicine, and let medicine be thy food

Hippocrates

Functional Foods



Doyon, M., & Labrecque, J. (2008). Functional foods: a conceptual definition. *British Food Journal*.

مثالهایی از غذاهای دارویی و داروهای غذایی در طب ایرانی

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- ✓ آب پنیر
- ✓ بادام
- ✓ سیب
- ✓ انار
- ✓ کاهو
- ✓ گشنیز
- ✓ اسفناج
- ✓ تمرهندی
- ✓ آلوبخارا
- ✓ زیتون
- ✓ گلاب
- ✓ شربت خاک شی
- ✓ ماالشعیر طبی
- ✓ ماهی های چرب

داروهای غذایی

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- ✓ پیاز
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- ✓ آش جو
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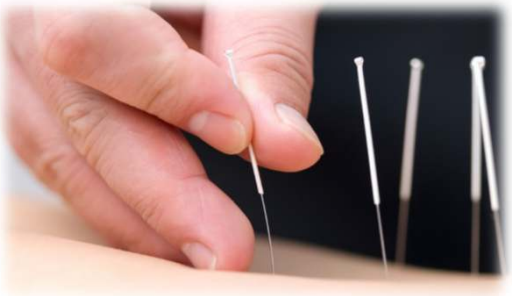
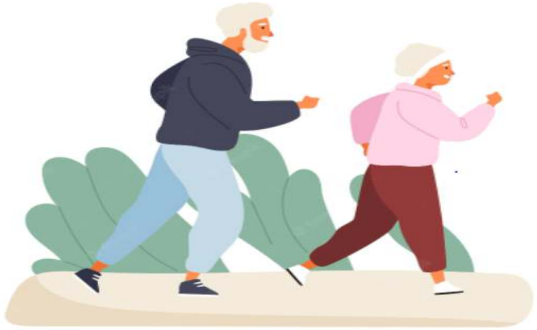


Complementary therapies to control sarcopenia



Functional foods, Nutraceuticals & Sarcopenia

- ✓Affecting muscle mass, strength, function and physical performance
- ✓High-quality protein: Optimal stimulation of muscle protein synthesis.
- ✓Vitamin D, antioxidants and ω 3-polyunsaturated fatty acids: preservation of muscle function.

- ✓Fish: Omega-3, proteins, vitamin D, magnesium, and carnitine

- ✓Nutritional problems in the elderly: loss of appetite and weight loss should be recognized early by routine screening for malnutrition

Rondanelli, M., Rigon, C., Perna, S., Gasparri, C., Iannello, G., Akber, R., ... & Freije, A. M. (2020). Novel insights on intake of fish and prevention of sarcopenia: All reasons for an adequate consumption. *Nutrients*, *12*(2), 307.

Medicinal herbs & Sarcopenia

- **Based on a systematic review and meta-analysis:**

➢Anti-inflammatory effects:

Phlebodium decamanum, *Citrus aurantium*, *Coffea arabica*, *Zingiber officinale*, *Eugenia punicifolia*, *Panax ginseng*, *Go-sha-jinki-Gan*, *Vitis vinifera*, and *Curcuma longa* L.)

➢Muscle Damage Prevention:

- *Curcumin, Zingiber officinale, Rhodiola rosea, Camellia sinensis*

➢Antifatigue:

- *Ginsenoside, marmelos fruit, Salvia sativa, Angelica sinensis, Cucurbita moschata, Withania somnifera, and Acanthopanax senticosus extracts*

Medicinal herbs & Sarcopenia

- Muscle Atrophy Prevention:

Curcuma longa, *Camellia sinensis*, *Cichorium intybus*, chestnut sweet flour, *Glycine max*, and *Chlorella*

- Muscle Regeneration and Differentiation:

Camellia sinensis, Vitis vinifera, Ferula hermonis Boiss., grape seed, Broussonetia kazinoki, Corydalis turtschaninovii, pine bark, Curcuma longa, Withania somnifera, and Eriobotrya japonica

Rondanelli, M., Miccono, A., Peroni, G., Guerriero, F., Morazzoni, P., Riva, A., ... & Perna, S. (2016). A systematic review on the effects of botanicals on skeletal muscle health in order to prevent sarcopenia. *Evidence-Based Complementary and Alternative Medicine*, *2016*.

Yoga & Sarcopenia

Review | Open Access | Published: 05 April 2019

The effects of yoga compared to active and inactive controls on physical function and health related quality of life in older adults- systematic review and meta-analysis of randomised controlled trials

Divya Sivaramakrishnan, Claire Fitzsimons, Paul Kelly, Kim Ludwig, Nanette Mutrie, David H. Saunders & Graham Baker

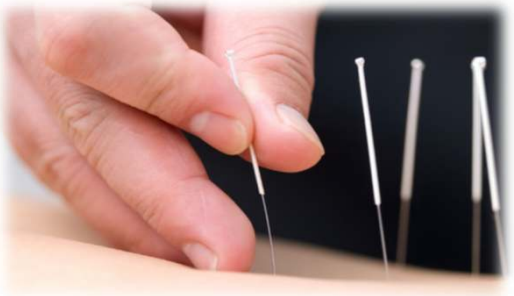
International Journal of Behavioral Nutrition and Physical Activity **16**, Article number: 33 (2019) | Cite this article

Findings:

Yoga interventions improve multiple physical function and health related quality of life outcomes.

Robust evidence for promoting yoga in physical activity guidelines for older adults as a multimodal activity that improves aspects of fitness like strength, balance and flexibility, as well as mental wellbeing.

Denham-Jones, L., Gaskell, L., Spence, N., & Pigott, T. (2022). A systematic review of the effectiveness of yoga on pain, physical function, and quality of life in older adults with chronic musculoskeletal conditions. *Musculoskeletal care*, *20*(1), 47-73.



Complementary therapies to control cardiometabolic disorders

Nutrition in metabolic disorders

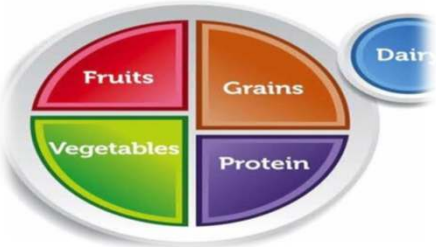
✓A core strategy of lifestyle modifications

In conventional sciences:

- Remarkable effects of various dietary patterns, certain types of food and nutrients on controlling metabolic parameters

In traditional sciences:

- Different recommendations on consumption or avoiding specific foods in various societies



Medicinal herbs and metabolic disorders

- **A systematic review and meta-analysis on Fenugreek:**
- Fenugreek seed vs. placebo can reduce:
- FBS (WMD: -12.94 mg/dL, 95%CI: -21.39 mg/dL, -4.49; I^2: 85.0%, $p_{heterogeneity}$ = 0.0001
- HbA1c (WMD: -0.58%%, 95% CI: -0.99, -0.17%; I2:0%, p heterogeneity =0.61)
- Total cholesterol (WMD:-9.13 mg/dL, 95% CI: -13.83, -4.43; I2:0, p heterogeneity = 0.48)
- Low-density lipoprotein cholesterol (WMD:-11.11 mg/dL, 95% CI: -20.32, -1.90; I2:1.41%, p heterogeneity = 0.36).

- No significant changes were observed in other cardiometabolic parameters.

Khodamoradi, K., Khosropanah, M. H., Ayati, Z., Chang, D., Nasli-Esfahani, E., Ayati, M. H., & Namazi, N. (2020). The effects of fenugreek on cardiometabolic risk factors in adults: a systematic review and meta-analysis. *Complementary Therapies in Medicine*, *52*, 102416.

Urica dioica (Nettle)

A systematic review and meta-analysis:

↓ FBS concentrations (WMD: −18.01 mg/dl, 95% CI: −30.04 to −5.97, p < .001, I2 = 94.6%).

No significant reduction was observed in:

Insulin levels (WMD: 0.83 95% CI: −0.26 to 1.92, p = .13, I2 = 89.4%)

HOMA-IR (WMD: −0.22, 95% CI: −0.83 to 0.40, p = .49, I2 = 69.2%)

HbA1C (WMD: −0.77%, 95% CI: −1.77 to 0.22, p = .12, I2 = 83.0%).

Ziaei, R., Foshati, S., Hadi, A., Kermani, M. A. H., Ghavami, A., Clark, C. C., & Tarrahi, M. J. (2020). The effect of nettle (Urtica dioica) supplementation on the glycemic control of patients with type 2 diabetes mellitus: A systematic review and meta-analysis. *Phytotherapy Research*, *34*(2), 282-294.

Cinammon

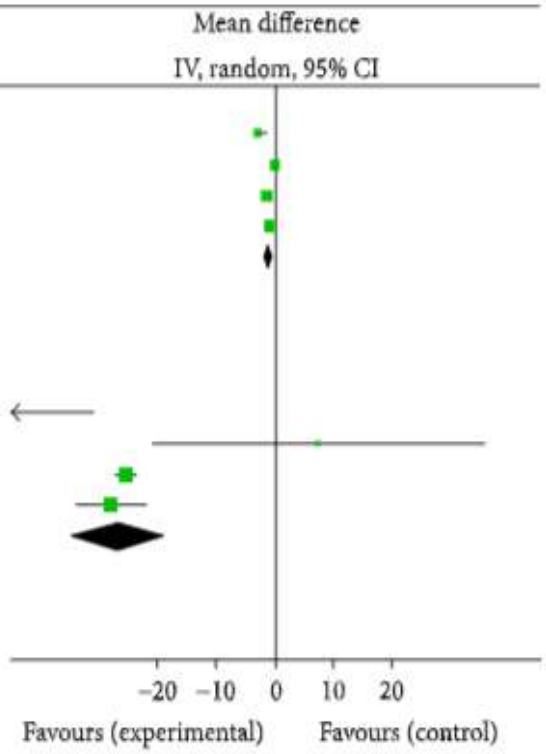
- A systematic review and meta-analysis:
- ↓ FBS by −19.26 mg/dL (95% CI: −28.08, −10.45; I^2:96.5%; p = 0.0001)

- No significant effect on:
- HbA1C
- Body weight, body mass index
- Waist circumference
- Serum levels of insulin and insulin resistance

Namazi, N., Khodamoradi, K., Khamechi, S. P., Heshmati, J., Ayati, M. H., & Larijani, B. (2019). The impact of cinnamon on anthropometric indices and glycemic status in patients with type 2 diabetes: A systematic review and meta-analysis of clinical trials. *Complementary therapies in medicine*, *43*, 92-101.

Silymarin

Study or subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Mean difference IV, random, 95% CI
1.1.1 HbA1c								
Huseini et al. 2006	6.78	1.05	25	9.45	2.16	25	18.7%	−2.67 [−3.61, −1.73]
Fallahzadeh et al. 2012	−0.18	0.72	28	−0.19	1.2379	28	25.2%	0.01 [−0.52, 0.54]
Hussain 2007	7.45	0.8	18	8.71	0.6261	20	26.3%	−1.26 [−1.72, −0.80]
Velussi et al. 1997	7.2	0.2	30	8	0.3	30	29.8%	−0.80 [−0.93, −0.67]
Subtotal (95% CI)			**101**			**103**	**100.0%**	**−1.07 [−1.73, −0.40]**
Heterogeneity: $\tau^2 = 0.38$; $\chi^2 = 27.84$; df = 3 ($P < 0.00001$); $I^2 = 89\%$								
Test for overall effect: $Z = 3.15$ ($P = 0.002$)								
1.1.2 Fasting Glucose								
Huseini et al. 2006	133	39	25	188	48	26	10.0%	−55.00 [−78.96, −31.04]
Fallahzadeh et al. 2012	−3.43	49.9536	28	−11	57.252	28	7.7%	7.57 [−20.57, 35.71]
Hussain 2007	167.58	2.34	18	193.14	3.6	20	45.0%	−25.56 [−27.47, −23.65]
Velussi et al. 1997	165	1	30	193	17	30	37.3%	−28.00 [−34.09, −21.91]
Subtotal (95% CI)			**101**			**104**	**100.0%**	**−26.86 [−35.42, −18.30]**
Heterogeneity: $\tau^2 = 41.39$; $\chi^2 = 11.67$; df = 3 ($P = 0.009$); $I^2 = 74\%$								
Test for overall effect: $Z = 6.15$ ($P < 0.00001$)								
Test for subgroup differences: $\chi^2 = 34.71$; df = 1 ($P < 0.00001$); $I^2 = 97.1\%$								



In addition, no significant effects on lipid profile and low quality studies

Dietary & Herbal Supplements

- Some emerging evidence suggests certain supplements may be helpful in lowering blood sugar levels:

- ✓ Cinnamon
- ✓ Chromium
- ✓ Alpha-lipoic acid(ALA)
- ✓ Berberine

Lack of evidence of efficacy and concern related to long-term safety: Routine supplementation with antioxidants e.g. vitamins E, C and carotene

American Diabetes Association guideline. 2021. Available at: https://care.diabetesjournals.org/content/44/Supplement_1

Dietary supplements

No clear evidence of benefit from supplements for people with diabetes without underlying deficiencies

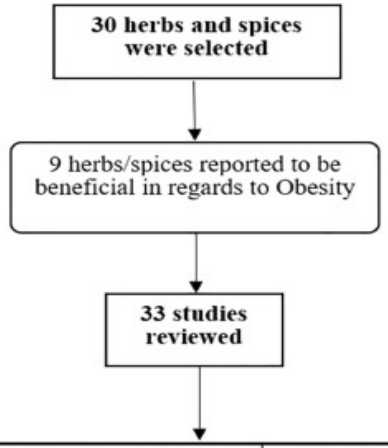
Metformin → **↓ Vitamin B12**

Recommendations:
periodic testing of vitamin B12 in metformin-treated patients

Particularly in patients with anemia or peripheral neuropathy

American Diabetes Association guideline. 2021. Available at: https://care.diabetesjournals.org/content/44/Supplement_1

Spices, obesity & Body composition



Herbs/Spices	Total number of studies	Significant result	Non-Significant result
Basil	1	1	0
Cardamom	3	2	1
Cinnamon	8	6	2
Fenugreek	1	0	1
Coriander and Garlic	1	1	0
Garlic	1	1	0
Ginger	7	4	3
Nigella	6	4	2
Turmeric	4	4	0
Nigella and Turmeric	1	1	0

- ✓ Basil (on weight and BMI)
- ✓ Cardamon (on weight, BMI, WC)
- ✓ Cinnamon (on weight, BMI, WC, FM)
- ✓ Coriandor (on BMI)
- ✓ Garlic (on BMI and WC)
- ✓ Ginger (on BMI, weight, WC, HC)
- ✓ Nigella sativa (weight, BMI, WC, FM, HC)
- ✓ Tumeric (weight, BMI, FM, WC)

Deekshith, C., Jois, M., Radcliffe, J., & Thomas, J. (2021). Effects of culinary herbs and spices on obesity: A systematic literature review of clinical trials. *Journal of Functional Foods*, *81*, 104449.

Yoga & cardiometabolic disorders

Science Press

Journal of Integrative Medicine
Volume 19, Issue 1, January 2021, Pages 6-12

Review

Yoga as a complementary therapy for metabolic syndrome: A narrative review

Dastan M. Khoshnaw [a], Abhijit A. Ghadge [b]

- No robust evidence for its efficacy. More rigorous research and well-designed trials that have a higher standard of methodology and evaluate yoga's long-term impacts on MS are needed.
- More studies for yoga's biochemical and molecular mechanisms of action on various metabolic pathways

Yoga, Diabetes and its complications

Contents lists available at ScienceDirect

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Review Article

The effects of yoga among adults with type 2 diabetes: A systematic review and meta-analysis

Herpreet Thind[a,*], Ryan Lantini[b], Brittany L. Balletto[b], Marissa L. Donahue[b], Elena Salmoirago-Blotcher[b,c], Beth C. Bock[b,d,e], Lori A.J. Scott-Sheldon[b,d,e]

Findings

Compared with controls, yoga participants were successful in improving their HbA1c (d + = 0.36, 95% CI = 0.16, 0.56; k = 16), FBG (d+ = 0.58, 95% CI = 0.40, 0.76; k = 20), and PPBG (d + = 0.40, 95% CI = 0.23, 0.56; k = 14). Yoga was also associated with significant improvements in lipid profile, blood pressure, body mass index, waist/hip ratio and cortisol levels. Overall, studies satisfied an average of 41% of the methodological quality (MQ) criteria; MQ score was not associated with any outcome (Ps > 0.05). Yoga improved glycemic outcomes and other risk factors for complications in adults with T2DM relative to a control condition. Additional studies with longer follow-ups are needed to determine the long-term efficacy of yoga for adults with T2DM.

Acupuncture & cardiometabolic disorders

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Volume 22, Issue 1

Acupuncture for Lowering Blood Pressure: Systematic Review and Meta-analysis FREE

Hyangsook Lee, Song-Yi Kim, Jongbae Park, Yun-ju Kim, Hyejung Lee, Hi-Joon Park

American Journal of Hypertension, Volume 22, Issue 1, January 2009, Pages 122–128,
https://doi.org/10.1038/ajh.2008.311
Published: 01 January 2009 **Article history**

Systolic BP change was not significant (MD:−5 mm Hg, 95% CI (−12, 1), $P = 0.12$) and acupuncture only marginally reduced DBP by 3 mm Hg (95% CI (−6, 0), $P = 0.05$).

When given with antihypertensive medication, acupuncture reduced SBP (−8 mm Hg, 95% CI (−10, −5), $P < 0.00001$) and DBP (−4 mm Hg, 95% CI (−6, −2), $P < 0.0001$).

More studies are needed.

Acupuncture & Metabolic Disorders

Complementary Therapies in Clinical Practice 36 (2019) 100–112

Contents lists available at ScienceDirect

Complementary Therapies in Clinical Practice

journal homepage: www.elsevier.com/locate/ctcp

Acupuncture for type 2 diabetes mellitus: A systematic review and meta-analysis of randomized controlled trials

Chao Chen[a], Jia Liu[b], Mengxiao Sun[c], Weihong Liu[a], Juan Han[a], Hongcai Wang[a,*]

[a] Institute of Acupuncture and Moxibustion, China Academy of Chinese Medical Sciences, China
[b] Institute of Basic Research for Clinical Medicine, China Academy of Chinese Medical Sciences, China
[c] World Federation of Acupuncture-Moxibustion Societies, China

Findings

. Compared with sham acupuncture or no acupuncture plus baseline treatments, acupuncture plus baseline treatments yield reduction in FBG(MD 1.21 mmol/l, 95%CI 1.56 to 0.87), 2 h BG(MD 2.13 mmol/l, 95%CI 2.79 to 1.46), HA1c (MD 1.12%, 95%CI 1.62 to 0.62). Our results also show acupuncture can improve blood lipids and blood pressure control, and reduce weight.

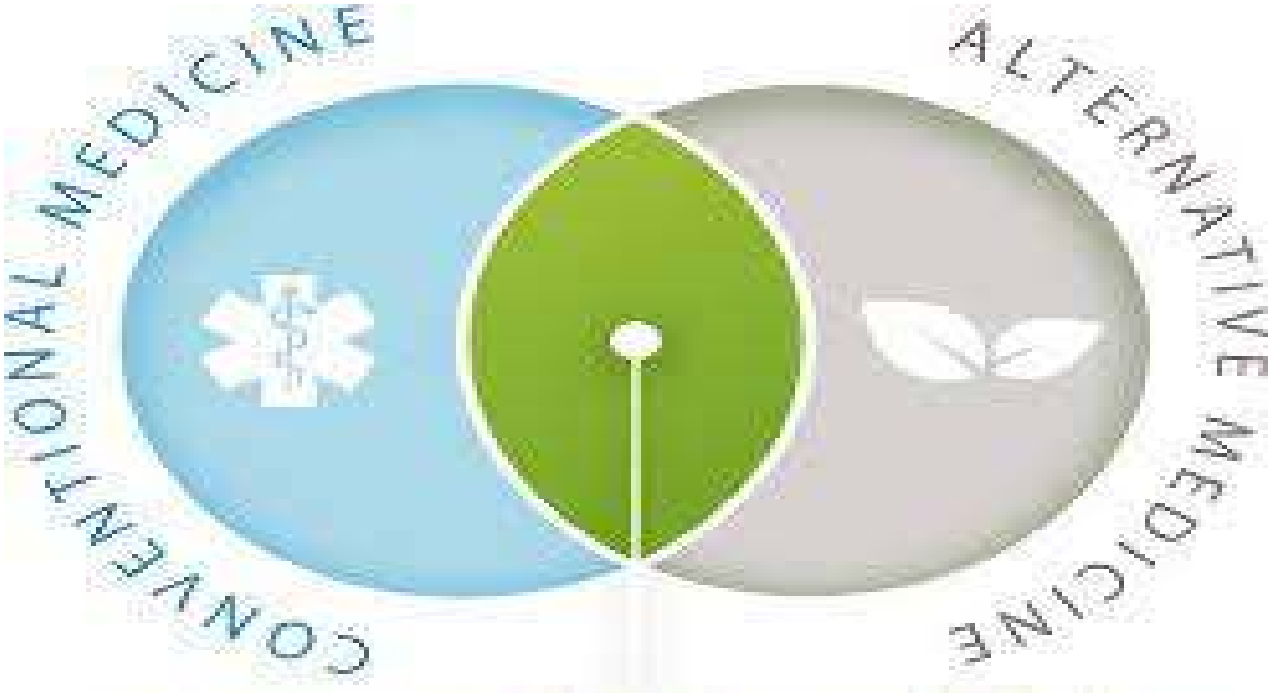
Due to the small sample size, poor methodological quality of trials reviewed, the amount of evidence is not fully convincing. There is a need for well-planned, long-term studies.

Acupuncture, obesity & Body Composition

- Auricular and electro acupuncture were both reduced BMI in obese patients.
- FM change after acupuncture treatment compared with sham treatment was statistically significant.
- Significant differences in WC and HC between the acupuncture and sham acupuncture groups were obtained.
- BW was not statistically significantly different between the acupuncture and sham acupuncture groups.

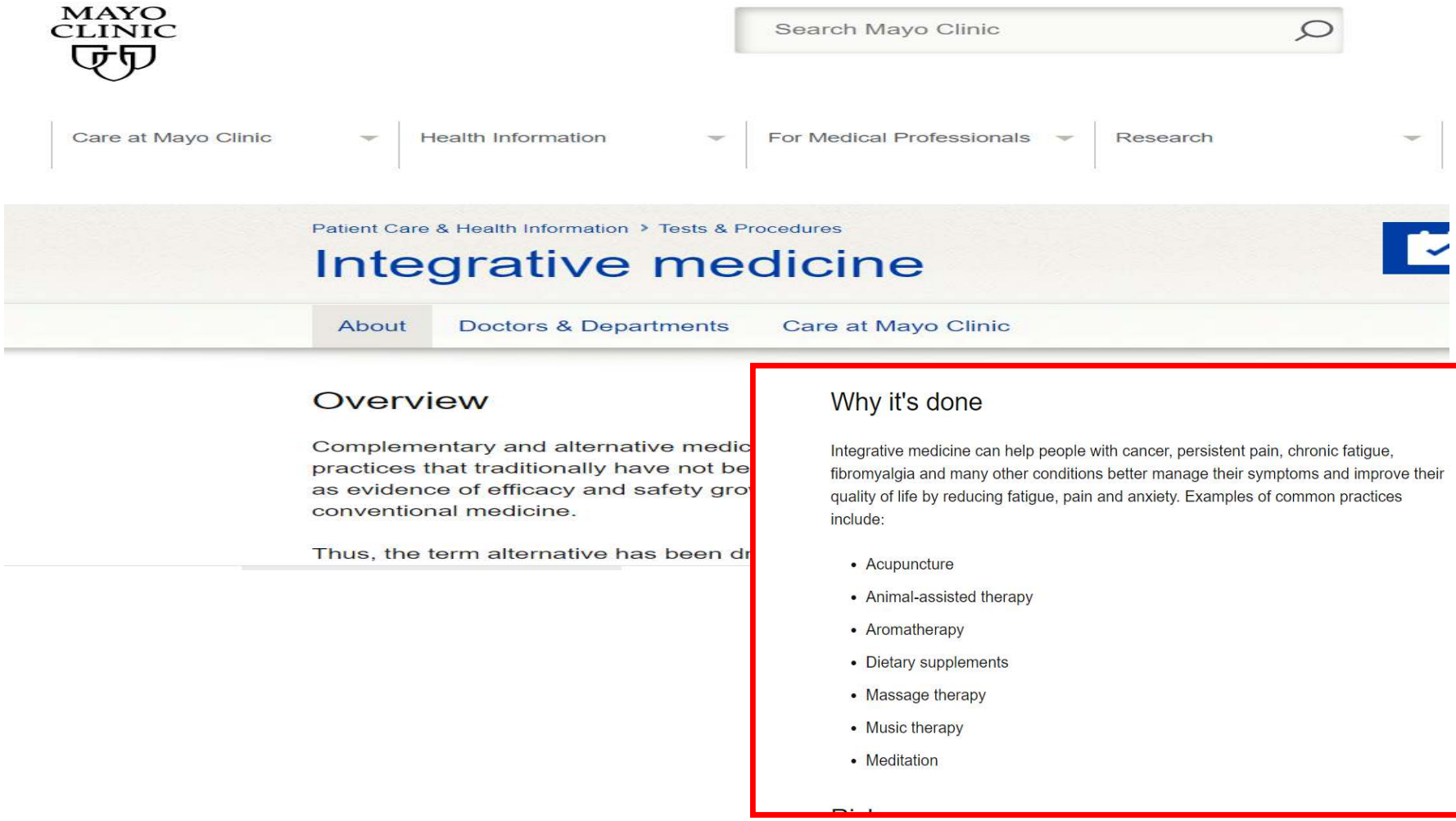
Zhang, R. Q., Tan, J., Li, F. Y., Ma, Y. H., Han, L. X., & Yang, X. L. (2018). Acupuncture for the treatment of obesity in adults: a systematic review and meta-analysis. *Postgraduate medical journal*, *93*(1106), 743-751.

Integrative Medicine



Benefits of an Integrative approach

- ✓ Cover both types of recommendations
- ✓A solution to those who are confused about discrepancies in accumulating evidence on traditional and modern dietary recommendations
- ✓Maybe more effective than relying on only conventional science



Available at: https://www.mayoclinic.org/departments-centers/integrative-medicine-health/sections/overview/ovc-20464567

Stanford HEALTH CARE

Center for Integrative Medicine

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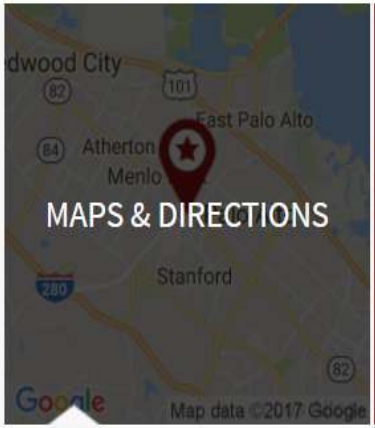
Integrative Medicine combines the best of mental (meditation, hypnosis), nutritional, acupuncture, and lifestyle treatments with mainstream modern medicine and psychotherapy to provide care for the whole person: mind and body. Started in 1998, the Stanford Center for Integrative Medicine (SCIM) is committed to evidence-based practices. We are here to help you live more fully, cope better with your medical condition, control symptoms, and participate more fully in your medical care.

Learn more about our classes:



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The science of integrative medicine

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Integrative Health Centre

Western Sydney Integrative Health - a NICM Health Research Institute initiative and academic multidisciplinary health centre - will open at Westmead in 2021.

Integrating evidence-based complementary therapies with mainstream healthcare, services will include:

- Acupuncture and Chinese herbal medicine
- Yoga therapy (group and individual)
- Meditation and mindfulness
- Tai chi
- Integrative medicine consultations with medical doctors
- Music therapy
- Oncology and remedial massage
- Exercise physiology
- Psychology

Available at: https://www.westernsydney.edu.au/nicm

Take-home message

✓Some types of complementary therapies such as medicinal herbs along with conventional treatments can be helpful to control cardiometabolic disorders.

✓Integrative approach considering the biological, psychological, and other aspects of patients with metabolic disorders can lead to better management.

✓Further high quality studies are needed on both traditional and integrative medicine to clarify their effectiveness on various metabolic disorders particularly in the elderly.

Thank you for your attention