

A New Paradigm For MS Care— Optimizing Health Through the Integration of Lifestyle, Alternative, and Conventional Medicine

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Conflict/Disclosure Information

- Research, consulting, advising, speaking
 - Acorda, Bayer, Biogen-Idec, EMD-Serono, Genzyme, Novartis, Pfizer, Questcor, Teva Neuroscience
 - American Academy of Neurology, Center for Disability Services, Consortium of MS Centers, Evergreen Health, Mandell Center for Multiple Sclerosis, National MS Society, ProCE
- Royalties
 - Demos Medical Publishing

Summary

- **Features of Paradigm**
 - Five underlying concepts
- **Application of Paradigm**
 - Evidence-based evaluation of many different lifestyle and unconventional therapies
- **Translation into Clinical Practice**
 - Seven-step approach

“New Paradigm”

- Types of Therapies
- Conditions That are Relevant to MS
- Whole Body Health
- Clinician-Patient Interaction
- Interpretation and Use of Evidence

Lifestyle and Unconventional Medicine

Under-Recognized and Under-Utilized Tools in the MS Toolbox

- Lifestyle Medicine
 - Daily habits and practices, such as diet and exercise, that are incorporated into conventional medical care in order to prevent or treat disease

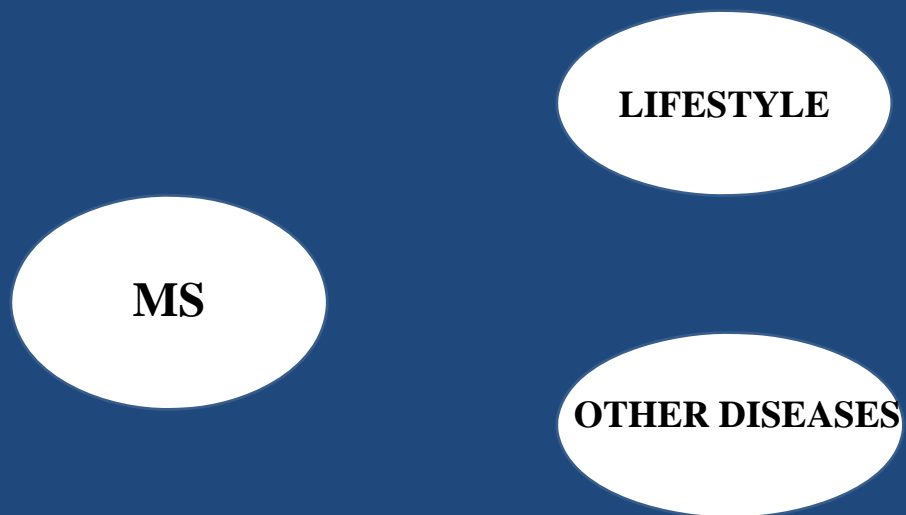
Lifestyle Medicine

- Typical “lifestyle diseases”
 - DM, obesity, high blood pressure, heart disease, cancer
 - Studies
 - 2009--Potsdam Study (“EPIC,” *Arch Int Med*, 169, 1355-1362)
 - N=23,153 Germans, prospective cohort study
 - End points: type 2 DM, MI, stroke, and cancer
 - 4 lifestyle factors: smoking, physical activity, healthy diet, BMI<30
 - All 4 factors: 78% lower risk of disease
 - 1 factor: 49% lower risk
 - 2004—Mokdad et al (*JAMA*, 291, 1238-1245)—similar findings
 - 1993—McGinnis and Foege (*JAMA*, 270, 2207)
 - About half of US deaths premature: due to modifiable risk factors: primary 3 plus alcohol, microbial exposure, toxic agents, firearms, sexual behavior, MVAs, illicit use of drugs

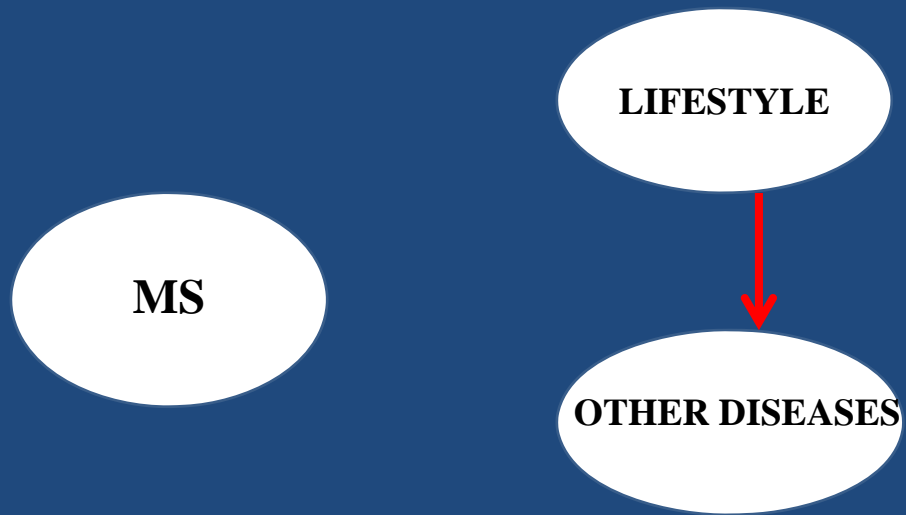
Lifestyle Medicine

- Atypical “lifestyle diseases”
 - Autoimmune diseases: MS, RA, psoriasis, IBD, type I DM
 - Emerging evidence for role of “Westernization”—diet, physical inactivity, hygienic conditions, high stress (Manzel et al, *Curr All Asthma Rep* 14:404-412 (2014))
 - Lifestyle and MS
 - Direct Effect: Risk or severity affected by lifestyle factors, such as physical activity, tobacco, salt and vitamin D intake
 - Indirect Effect: Quality of life and disability affected by typical lifestyle diseases

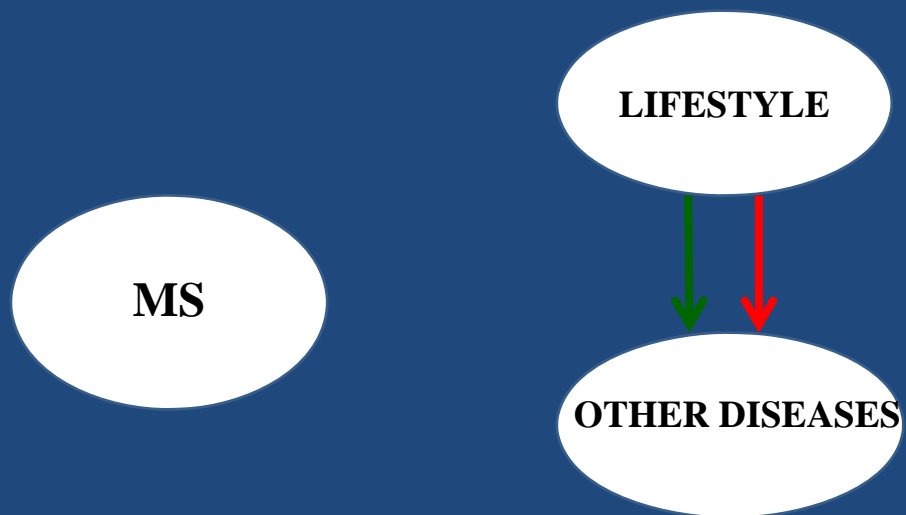
MS, “Other” Diseases, and Lifestyle



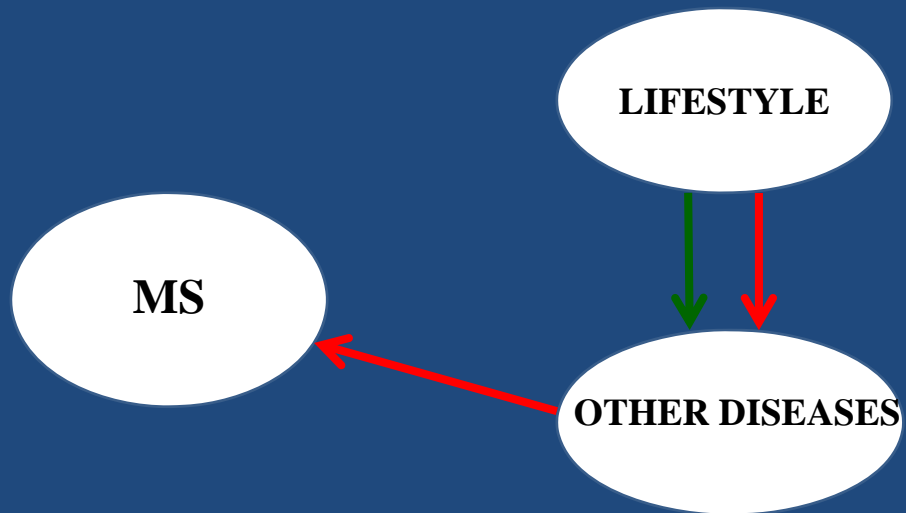
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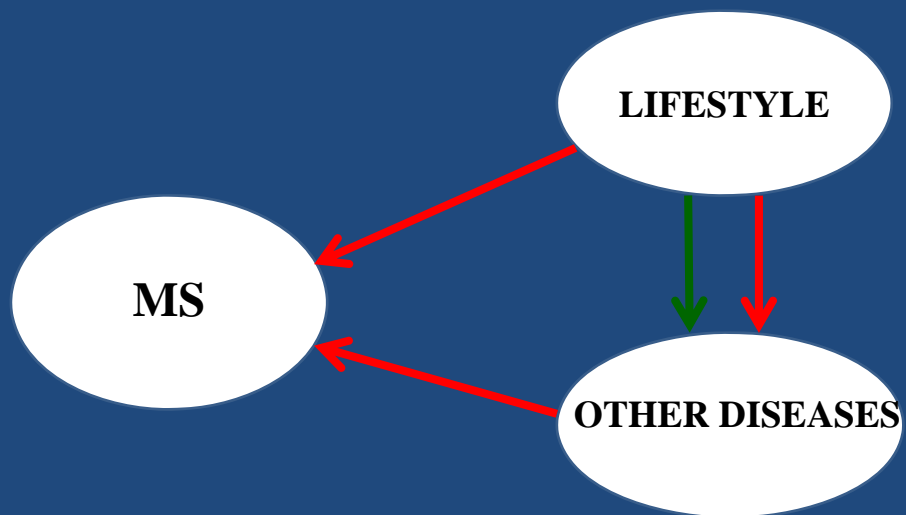
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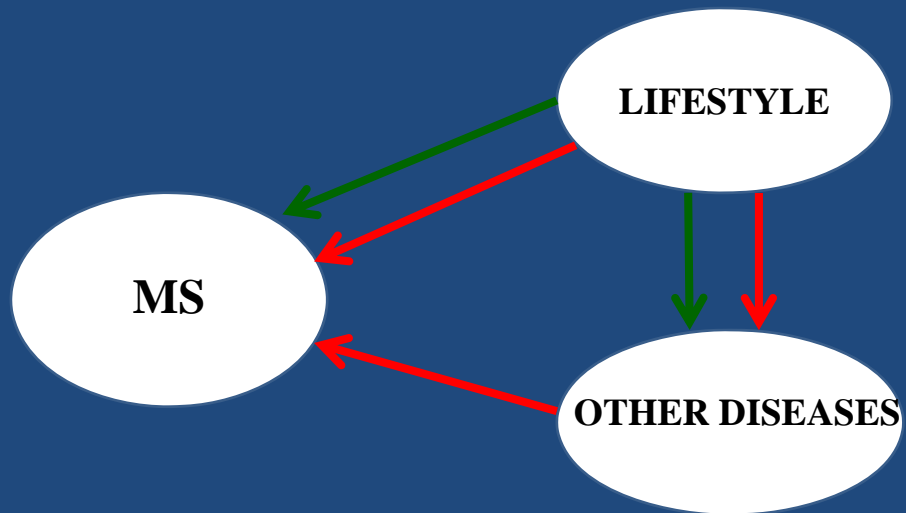
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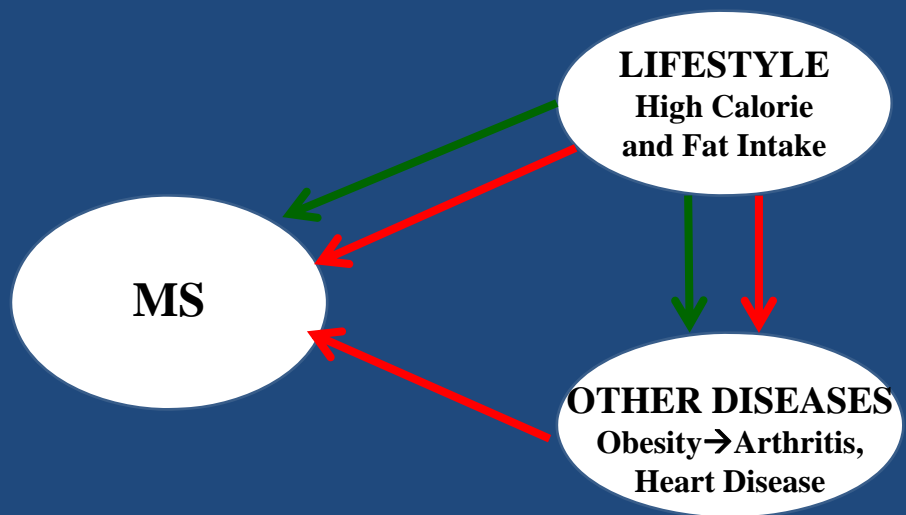
MS, "Other" Diseases, and Lifestyle



MS, "Other" Diseases, and Lifestyle



MS, "Other" Diseases, and Lifestyle



Comorbidities and MS

- Mental: depression 50%, anxiety 36%
- Physical: hyperlipidemia, hypertension, arthritis, IBS, chronic lung disease
- Impact of comorbidities in MS
 - Increased disability with increased number of physical comorbidities
 - More rapid disability progression
 - Musculoskeletal conditions
 - HTN, hypercholesterolemia, DM, PVD
 - Lower HRQOL with more comorbidities

– Marrie et al, *Continuum* 2013;19:1046-1057, Marrie et al, *Lancet Neurol* 2010;9:820-828.

Lifestyle and Unconventional Medicine

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Lifestyle and Unconventional Medicine

Under-Recognized and Under-Utilized Tools in the MS Toolbox

- Lifestyle Medicine
 - Daily habits and practices, such as diet and exercise, that are incorporated into conventional medical care in order to prevent or treat disease
- Unconventional Medicine
 - Also known as complementary and alternative medicine (CAM)
 - Therapies that are generally not taught in medical schools or provided in hospitals

Complementary and Alternative Medicine (CAM)

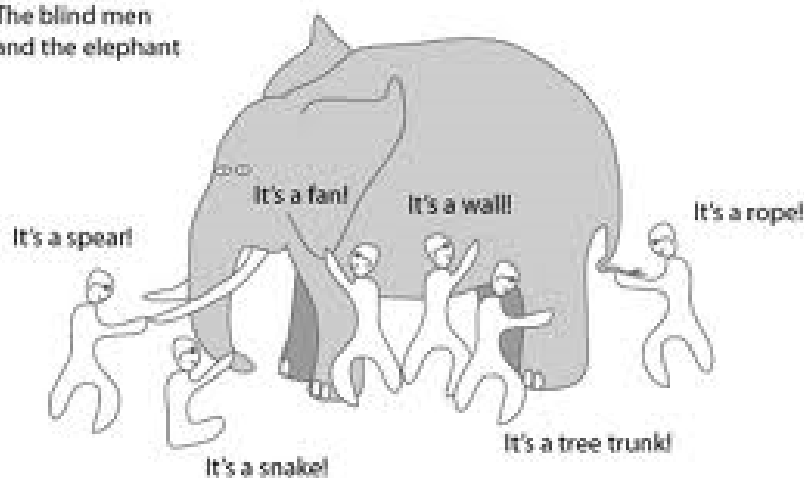
- Relatively high use
 - General Population: about 40%
 - MS: about 50-70%
 - Most CAM is used in conjunction with conventional medicine: 80-90%
- May be beneficial, ineffective, harmful
- Reasons for use in MS
 - *Not* as a cure
 - Relieve symptoms, increase control, improve health, account for mind-body-spirit

Which Approach and Which Clinician Are in Which Category/Compartment?

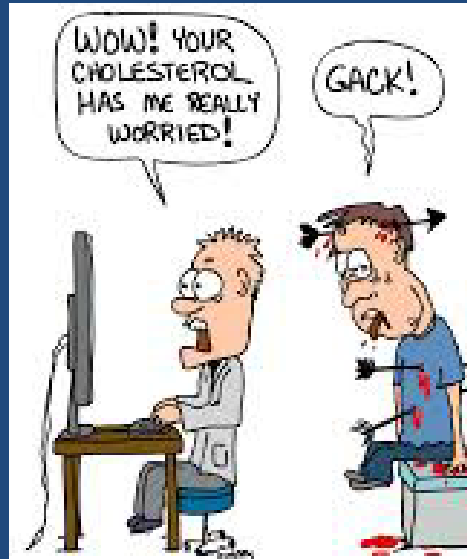
- Lifestyle Medicine
- Unconventional Medicine
- Conventional Medicine
 - Specialization and sub-specialization

“Dis-Integrated Approaches”

The blind men and the elephant



“Dis-Integrated Approaches”



Integrated Approach: “Integrative Medicine”

- Integration (decompartmentalization) of lifestyle, unconventional, and conventional medicine

Integrated Approach: “Integrative Medicine”

- Integration (decompartmentalization) of lifestyle, unconventional, and conventional medicine
- **ALSO**
 - Emphasizes health and wellness of the whole person
 - Supportive clinician-patient relationship

Challenges with Lifestyle and Unconventional Medicine

- Books and other written material
 - Extremely variable quality
- Products and CAM/lifestyle practitioners
 - Exaggerated claims, profits, limited neuro knowledge
- Conventional health providers
 - Little or no training/knowledge, unappealing or repulsive, limited time/resources *especially with MS rx advances*, reimbursement issues, no medicolegal implications, different mindset and skill set



"Give it to me straight, Doc. How long do I have to ignore your advice."



“New Paradigm”

- Types of Therapies
- Conditions That are Relevant to MS
- Whole Body Health
- Clinician-Patient Interaction
- Interpretation and Use of Evidence

Levels of Evidence: American Academy of Neurology

- Class I
 - Randomized, controlled, objective outcome
 - Extra criteria: concealed allocation, primary outcome clearly defined, exclusion and inclusion criteria clearly defined, adequate accounting for dropouts and crossovers
- Class II: lacks one criterion
- Class III: all other controlled trials with independent outcome assessment
- Class IV: all other studies

Levels of Evidence: AHRQ Report, 2002

- Agency for Healthcare Research and Quality
 - Agency within US Dept of Health and Human Services
- 2002 review (West et al, Systems to rate the strength of scientific evidence: Summary. In *AHRQ Evidence Report Summaries 47*).
 - Many methods: 49 for RCTs, 19 for obs. studies
 - Many not well designed for clinical recommendations
 - One size does not “fit all,” especially with “less traditional” bodies of evidence
 - Too focused on individual studies, overly complex
 - Rigid hierarchy: simplistic, misunderstand meaning of evidence

Levels of Evidence

- “It is what you feel in your own body and mind that is the most important thing, and it is very easy for doctors and patients to forget that. I believe that a little of what you fancy does do you good!”

Elizabeth Forsythe, MD

- “Studies which have not ‘proven’ the treatment to be beneficial but which suggest a major benefit look much more interesting when you actually have the disease, especially when the treatment has other health benefits as well...Despite [its] effectiveness, lifestyle change is often not promoted.”

George Jelinek, MD

Levels of Evidence

- “I have practiced evidence-based medicine for several decades and am very familiar with the rating systems for clinical trial evidence. I also have MS. When considering therapeutic options for my MS, I am interested in Class IV studies with less than 10 patients. I am also interested in trials with MS relevance that are conducted in people with conditions other than MS. I have benefitted significantly from the rational use of low-risk therapies that have limited evidence for efficacy in MS, such as yoga, meditation, and massage.”

HH

Ratings



Essential

Benefits far outweigh risks



Worth Considering

Some indication of benefit, little or no risk



Uncertainties

Uncertainties about safety and/or effectiveness



Avoid or Limit Use

Significant safety concerns and/or risks greatly outweigh benefits

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Ratings



Essential Benefits far outweigh risks

Alcohol *abstention or moderate use*

Exercise

Fiber *in recommended amounts*

Gluten restriction *in celiac disease*

Salt *in recommended amounts*

Tobacco *none*

Vitamin B12 supplements *if vitamin B12 deficient*

Weight management



Weight Management and Obesity

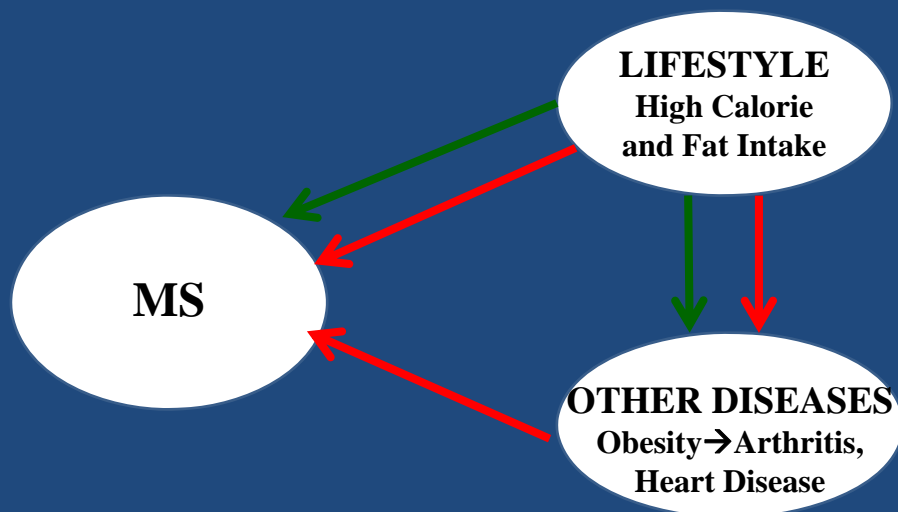
- Obesity and MS risk
 - Increased risk with childhood/adolescent obesity
- Obesity in those with MS
 - No clear effect on disease course
 - May provoke MS symptoms
 - Fatigue, sleep, bladder, depression
 - Multiple possible “indirect” effects
 - Increased risk for other diseases that may negatively affect those with MS



Weight Management and Obesity

- Obesity-associated diseases and MS
 - Obesity increases risk of arthritis, diabetes, heart disease, high blood pressure, high cholesterol
 - All of these conditions are associated with more rapid progression of disability in MS
 - The greater the number of other medical conditions in MS, the lower the quality of life

MS, “Other” Diseases, and Lifestyle





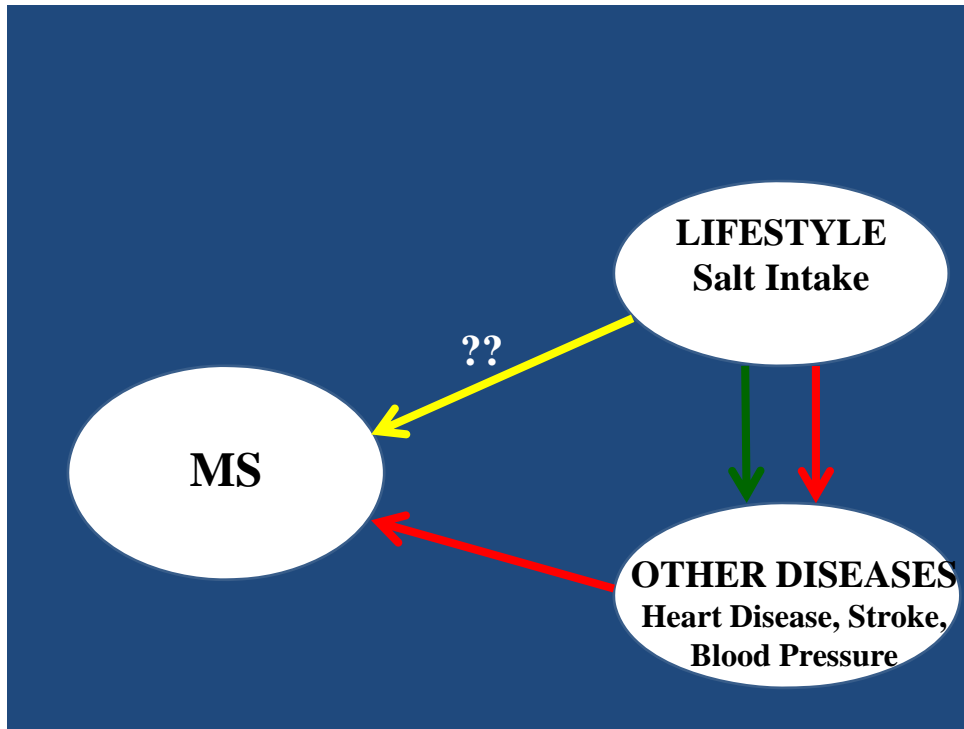
Salt

- One of single greatest dietary harms to health
- Average American: 4,000 mg/day
- Recommended amount: 1,500-2,300 mg/day
- High salt intake increases disease risk
 - High blood pressure, heart disease, stroke, congestive heart failure, kidney disease
- Effect of 1,200 mg decrease in salt intake in US
 - Dramatic decrease in death/disability
 - 150,000 lives and \$10-24 billion saved annually



Salt

- *Nature* (April 2013, Vol 496)
 - 3 different articles
 - Increased salt conditions: increased production of pro-inflammatory T_H17 cells and more severe EAE
- Correale et al (*J Neurol Neurosurg Psych*, 2014)
 - Medium salt intake: 2.75-fold increased attack risk
 - High salt intake: 3.95-fold increased attack risk, 3.4-fold increased risk of new MRI lesion, 8 more T2 lesions



Ratings



Essential

Benefits far outweigh risks



Worth Considering

Some indication of benefit, little or no risk



Uncertainties

Uncertainties about safety and/or effectiveness



Avoid or Limit Use

Significant safety concerns and/or risks greatly outweigh benefits

Ratings



Worth Considering Some indication of benefit,
little or no risk

Acupuncture	Coffee	Massage
Biofeedback	Cooling therapy	Meditation
Caffeine	Cranberry	Mindfulness
Chiropractic	Guided imagery	Multivitamins
<i>for low back pain</i>	Hippotherapy	Music therapy
	Hypnosis	

Ratings



Worth Considering Some indication of benefit,
little or no risk

Pets	SAMe
Pilates method/ PhysicalMind method	Tai chi/Qi Gong Therapeutic horseback riding
Prayer and spirituality	Valerian
Psyllium	Vitamin D
	Yoga



Vitamin D

- Deficiency or insufficiency
 - 50% or more of general population
- Many possible causes
 - Sunscreen
 - Sun avoidance
 - Obesity
 - Decreased intake of fortified foods

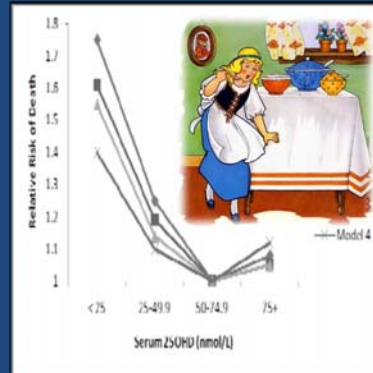


Vitamin D: Clinical Studies

- Definite *causality*: bone health
- *Associations* (observational studies)
 - MS: risk, attacks, disability progression, symptoms
 - More than 20 other conditions: other autoimmune, cancer, cardiac, lung, psychiatric
- MS intervention studies
 - Variable results
 - Current “score:” YES 3, NO 3

Can Modest Doses or High Normal Levels be Toxic?

- Vitamin D supplements
 - Toxicity with very high doses: “intoxication,” “hypervitaminosis D”
 - Emerging concerns with chronic, moderately high doses or levels (? reverse J-shaped curve)
 - All-cause mortality, some cancers (eg pancreatic), heart disease risk, fractures, falls
 - ? More than 4,000 IU daily or 55ng/ml



Ratings

?

Uncertainties Uncertainties about safety and/or effectiveness

ALCAR	Chiropractic for neck	Garlic
Alpha-lipoic acid	<i>pain and conditions</i>	Ginkgo
Amino acids	<i>other than low back</i>	Ginsengs
Antioxidant vitamins	<i>pain</i>	Glucosamine
Aromatherapy	Coenzyme Q10	Gluten restriction
Aspartame avoidance	Craniosacral therapy	<i>generally</i>
Ayurvedic	Creatine	Goldenseal
supplements	Feldenkrais	Grape seed extract
Bee pollen	Fish oil	Homeopathy
		Inosine

Ratings



Uncertainties Uncertainties about safety and/or effectiveness

Inosine	Paleolithic diet	Swank diet
Lecithin	Probiotics	Therapeutic touch
Low dose naltrexone (LDN)	Prokarin	Threonine
Magnets	Propolis	Tragerwork
Marijuana	Pycnogenol	
Melatonin	Raw honey	
Oligomeric proanthocyanidins (OPC)	Reflexology	
Padma 28	Resveratrol	
	Royal jelly	
	St. John's wort	
	Stinging nettle	

Ratings



Uncertainties Uncertainties about safety and/or effectiveness

- **Gluten restriction generally**
- **Paleolithic diets**
- **Probiotics**

Ratings



Avoid or Limit Use Significant safety concerns and/or risks greatly outweigh benefits

5-HTP	Chelation therapy	Enzyme therapy
Androstenedione	Chinese herbal	Germanium
Ashwagandha	medicine	Hyperbaric
Asian proprietary	Chronic cerebrospinal	oxygen
medicine	insufficiency (CCSVI)	Kava kava
Ayurvedic	Colon therapy	Protandim
supplements	Dental amalgam	Spirulina
Bee venom therapy	removal	Yohimbe
Calcium EAP	DHEA	Yohimbine
Candida treatment	Echinacea	



Supplements and Herbs with Potential Side Effects or Drug Interactions

- More than 200 different products
 - “Immune stimulation”
 - Significant toxicity
 - MS-relevant side effects
 - Fatigue, urinary irritation
 - MS-relevant drug interactions



Potentially Harmful Supplements

Acanthopanax obovatus
Alfalfa
Alkanna
Aloe
Alpine ragwort
American chestnut
American ginseng
American hellebore
American pennyroyal
Andrographis
Androstenedione
Angelica sinensis
Angel's trumpet
Aristolochia fangchi
Artemisia annua
Artemisia myriantha
Ashwagandha (Withania
sommifera)
Asiatic dogwood
Asian ginseng
Asparagus



Potentially Harmful Supplements

Acanthopanax obovatus	Astragalus
Alfalfa	Autumn crocus
Alkanna	Azadirachta indica
Aloe	Bacopa (brahmi)
Alpine ragwort	Baijiaolia
American chestnut	Bayberry
American ginseng	Bee pollen
American hellebore	Belladonna
American pennyroyal	Beta-carotene
Andrographis	Bishop's weed
Androstenedione	Bissy nut
Angelica sinensis	Bitty almond
Angel's trumpet	Bitter orange
Aristolochia fangchi	Black bryony
Artemisia annua	Black cohosh
Artemisia myriantha	Black currant seed oil
Ashwagandha (Withania sommifera)	Blue cohosh
Asiatic dogwood	Blue-green algae
Asian ginseng	Boerhavia diffusa
Asparagus	Boldo
	Borage seed oil



Potentially Harmful Supplements

Acanthopanax obovatus	Astragalus	Brahmi
Alfalfa	Autumn crocus	Bryonia
Alkanna	Azadirachta indica	Buchu
Aloe	Bacopa (brahmi)	Buckthorn
Alpine ragwort	Baijiaolia	Bumweed
American chestnut	Bayberry	Bupleurum
American ginseng	Bee pollen	Bushi
American hellebore	Belladonna	Butterbur
American pennyroyal	Beta-carotene	Caffeine
Andrographis	Bishop's weed	Calabar bean
Androstenedione	Bissy nut	Calamus
Angelica sinensis	Bitty almond	Calendula
Angel's trumpet	Bitter orange	California poppy
Aristolochia fangchi	Black bryony	Caowu
Artemisia annua	Black cohosh	Cascara sagrada
Artemisia myriantha	Black currant seed oil	Cassia cinnamon
Ashwagandha (Withania somnifera)	Blue cohosh	Castor
Asiatic dogwood	Blue-green algae	Celery
Asian ginseng	Boerhavia diffusa	Cat's claw
Asparagus	Boldo	Catnip
	Borage seed oil	Chamomile



Potentially Harmful Supplements

Chaparral	Dong-quai	Goa powder
Chenopodium oil	Dusty miller	Golden ragwort
Chlorella	Echinacea	Gotu kola
Cissus quadrangularis	Elecampine	Gravel root
Cod-liver oil	Elderberry	Greater celandine
Coenzyme Q10	Ephedra	Green tea
Coffee	Epimedium sagittatum	Grindelia
Coix	Eucalyptus	Ground ivy
Cola nut	European mandrake	Groundsel
Colocynth	European mistletoe	Guangfangji
Coltsfoot	Figwort	Guarana
Comfrey	Flaxseed oil	Guiji
Copaiba oleoresin	Fo-ti	Hawaiian baby woodrose
Cordyceps	Foxglove	Hedge-hyssop
Country mallow	Fragrant sumach	Heliotropium
Cubeb	Fuzi	Hemp agrimony
Cypress	Garlic	Henbane
DHEA	Ge-gen-tang	Hops
Datura preparations	Germanander	Horny goat weed
Dendrobium	Germanium	Horseradish
Dill seed	Ginkgo biloba	Horse chestnut



Potentially Harmful Supplements

Hound's tongue	Licorice	Motherwort
5-HTP	Liferoot	Mountain ash
Huperzine A	Ligustrum lucidum	Myrrh
Hydrocotyle	Lily-of-the-valley	Naoyanghua
Indian snakeroot	Liverwort	Neem
Jamaican dogwood	Lobelia	Niacin
Jiaogulan	Lovage	Nimba arishta
Jimson weed	Ma huang	Noni
Jin bu yuan	Madagascar periwinkle	Oak bark
Juniper berries	Magnolia	Parsley
Kakkan-to	Maharishi-4	Passionflower
Kanakasava	Maharishi-5	Pau d'arco
Kanzo-bushi-to	Maitake mushroom	Pennyroyal oil
Kava kava	Mangosteen	Periwinkle
Khella	Marsh tea	Peru balsam
Kombucha	Mate	Picrorhiza
Larch arabinogalactan	Melatonin	Pheasant's eye
Larch turpentine	Melilot	Phyllanthus emblica
Lavender	Mistletoe	Pine needles
Lemon balm	Momoridica charantia	Precatory bean
Lemon verbena	Morinda citrifolia (noni)	Propolis



Potentially Harmful Supplements

Pulsatilla	Selenium	Tinospora cordifolia
Psyllium	Senna	Tolu balsam
Pycnogenol	Shepherd's purse	Tormentil
Pyridoxine	Shiitake mushroom	Trichopus zeylanicus
Red sedge	Shosaiko-to	Tripterygium wilfordii
Red yeast	Siberian ginseng	Turpentine oil
Reishi mushroom	Skullcap	Uva ursi
Resveratrol	Sophora flavescens	Valerian
Rosemary	Sorrel	Vitamin A
Royal jelly	South African geranium	Vitamin B ₃
Rue	Spirulina	Vitamin B ₆
S-adenosylmethionine	Squill	Vitamin C
Sage	Stinging nettle	Vitamin E
St. John's wort	Storax	Watercress
Salvia miltiorrhiza	Sweet bay	White sandalwood
Sandalwood	Sweet clover (melilot):	Wild lettuce
Sarsaparilla	Tansy	Witch hazel
Scopolia:	Tansy ragwort	Withania somnifera
Savin tops	Thuja	Woodfordia fruticosa
Sceletium	Thunder god vine	Wood sorrel
Sassafras	Thyme	Wormseed



Potentially Harmful Supplements

Wormwood
Xiao-chai-hu-tang
Yangjinhua
Yellow dock
Yerba mansa
Yohimbe or yohimbine
Zinc

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Translation into Clinical Practice

- **Current Standard of Care**
 - DMTs and symptom management

PLUS
- **Five Concepts**

PLUS
- **Lifestyle and Unconventional Medicine**
 - “Essential” and “Worth Considering”

Seven Steps

- **Step 1** Disease-modifying medications
- **Step 2** Diet, dietary supplements, and weight management
- **Step 3** Physical activity
- **Step 4** Personal and social well-being
- **Step 5** Tobacco and alcohol use
- **Step 6** Prevention/management of other medical conditions
- **Step 7** Symptom management

Seven Steps to Integrate Lifestyle, Alternative, and Conventional Medicine

- Concepts
 - Typical Westernized lifestyle has adverse effects on MS and general health
 - Other medical conditions have adverse effects
 - Some of the most beneficial treatment approaches may be those that use “built-in resources” of human body and do *not* require any medications, supplements, devices, or technology

Seven Steps

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Seven Steps: Many More Treatment Options

- If DMT not appropriate, there are still 6 other steps to pursue
 - Secondary or primary progressive
 - Pregnancy/breastfeeding
 - Other reason for not being on DMT

Seven Steps

- **Step 1** Disease-modifying medications
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Summary of Dietary Approaches



Essential Fiber in recommended amounts, gluten restriction in celiac disease, salt in recommended amounts, vitamin B12 supplements if deficient, weight management



Worth Considering “Healthful diet,” multivitamins, vitamin D and calcium



Uncertainties Gluten restriction generally, paleolithic diets, probiotics, many supplements including antioxidants and fish oil



Avoid or Limit Use Many many supplements, colon therapy, enzyme therapy

Seven Steps

- **Step 1** Disease-modifying medications
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Physical Activity

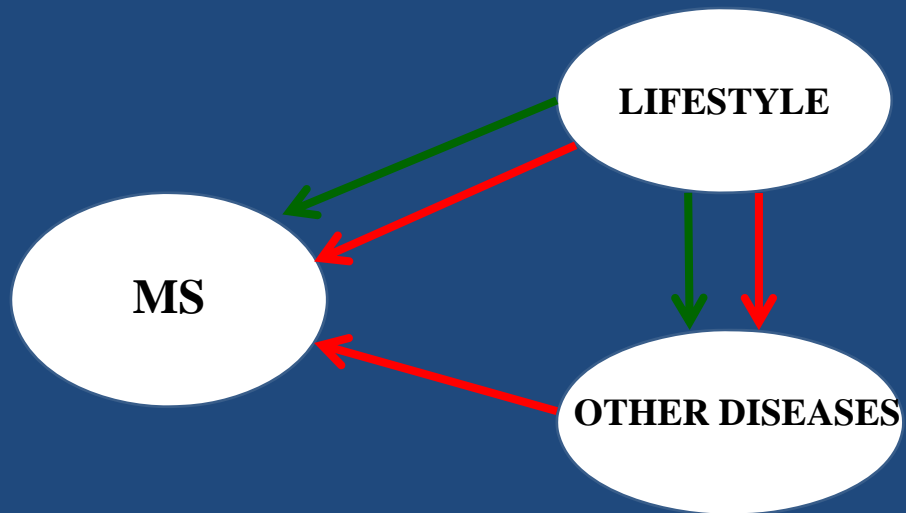


Physical Activity and MS

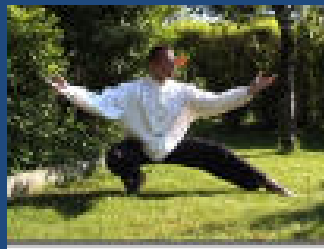
- Change in attitude about MS and exercise
 - Jimmie Heuga-pioneered exercise concept
- Many benefits
 - Physical: strength, walking, spasticity
 - Emotional: depression, anxiety, anger
 - Paradoxical: fatigue
 - Other MS symptoms: pain, cognitive function, sleeping difficulties, bowel, bladder, and sexual function
 - General health: osteoporosis, heart disease, stroke, high blood pressure, blood lipids, obesity, diabetes, cancer, risk of death



MS, “Other” Diseases, and Lifestyle

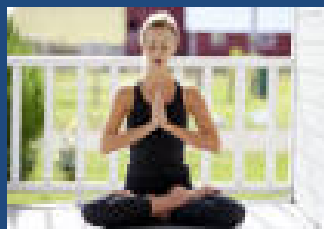


✓ Unconventional Forms of Exercise



• T'ai chi

- Two MS studies
 - Emotional and social function, gait, spasticity
- Other studies
 - Anxiety, depression, fatigue, strength, sleep, cognition, pain



• Yoga

- Class I study in MS: fatigue
- 8 other MS studies
 - Anxiety, depression, gait, bladder function, pain, spasticity, quality of life

Husted et al. *Alt Ther Health Med* 199;5:425-431; Mills and Allen. *Gen Hosp Psych* 2000;22:425-431; Oken et al. *Neuro* 2004;62:2058-2064.

Summary of Physical Activity Approaches



Essential Exercise



Worth Considering Therapeutic horseback riding, Pilates, tai chi, yoga



Uncertainties Feldenkrais, Tragerwork



Avoid or Limit Use None

Seven Steps

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Ratings



Essential Benefits far outweigh risks

Alcohol abstention or moderate use

Exercise

Fiber in recommended amounts

Gluten restriction in celiac disease

Salt in recommended amounts

Tobacco none

Vitamin B12 supplements if vitamin B12 deficient

Weight management

Ratings



Worth Considering Some indication of benefit, little or no risk

Acupuncture

Biofeedback

Caffeine

Chiropractic for low back pain

Coffee

Cooling therapy

Cranberry

Guided imagery

Hippotherapy

Hypnosis

Massage

Meditation

Mindfulness

Multivitamins

Music therapy

Pets

Pilates method and

PhysicalMind method

Prayer and spirituality

Psyllium

SAMe

Tai chi and Qi

Gong

Therapeutic horseback riding

Valerian

Vitamin D and calcium

Yoga

Fatigue

- Conventional
 - Diagnostic evaluation
 - Lifestyle changes
 - Medications
 - Provigil/Nuvigil
 - Amantadine
 - Antidepressants
 - others

Fatigue

- Conventional
 - Diagnostic evaluation
 - Lifestyle changes
 - Medications
 - Provigil/Nuvigil
 - Amantadine
 - Antidepressants
 - others
- Unconventional/Lifestyle
 - Possibly effective
 - Caffeine
 - Cooling
 - Exercise, tai chi, yoga
 - Mindfulness, meditation
 - Multiple others
 - Uncertain
 - Ginkgo biloba
 - Acetyl-L-carnitine
 - CAUTION!
 - Ginsengs, DHEA, androstenedione, spirulina

Gait Disorder

- Conventional
 - Physical Therapy
 - Dalfampridine (Ampyra)
 - Spasticity Rx
 - Assistive Devices

Gait Disorder

- Conventional
 - Physical Therapy
 - Dalfampridine (Ampyra)
 - Spasticity Rx
 - Assistive Devices
- Unconventional/Lifestyle
 - Possibly effective
 - Cooling
 - Hippotherapy
 - Pilates
 - Tai Chi
 - Yoga
 - Multiple others

Dealing with the Realities of Clinical Practice

- Brief, strong, supportive statements
- Focus on one issue per visit
- Refer patients to information resources
- Share or transfer responsibility/accountability
 - Other providers (PCPs), patients
- Change practice model: “Direct Care,” “Concierge Care”

References

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- Julie Lawton
- Many people with MS
- National MS Society
- Consortium of MS Centers
- MS Foundation
- MS Association of America
- Teva Neuroscience, Biogen-Idec, EMD-Serono, Pfizer, Bayer
- HealthOne Foundation
- Denver Botanic Gardens
- Hudson Gardens
- Denver Medical Library