

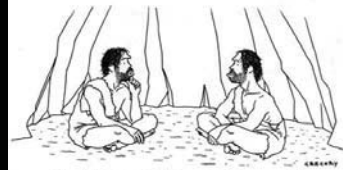
The Scientific Foundations of Integrative Medicine



James D Duffy MD FANPA FAAHPM DABMA
Chief of Integrative Medicine, Sierra Tucson

"I have heard that in ancient times the people lived to be over a hundred years, and yet remained active and did not become decrepit in their activities. But nowadays people reach only half that age and yet become decrepit and failing."

The Yellow Emperor to Qibo

"Something's just not right—our air is clean, our water is pure, we all get plenty of exercise, everything we eat is organic and free-range, and yet nobody lives past thirty."

FIVE Elements
Five Medicines



Pillars Attributes

Five Practices

"The mysteries of the Great and the Little world are distinguished only by the form in which they manifest themselves; for they are only one thing, one being."

PARACELSUS



OBJECTIVES

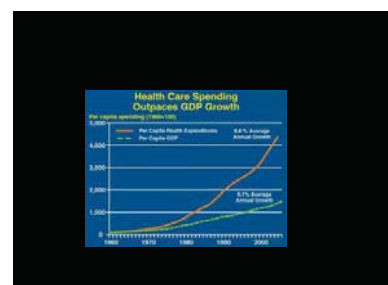
- Explore a novel model of Integrative pathophysiology.
- Describe recent scientific discoveries that suggest new approaches to understanding and implementing integrative approaches to health and healing.
- Describe a model for implementing integrative mental healthcare

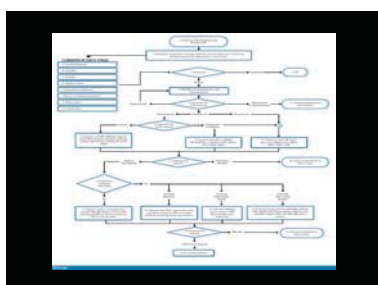
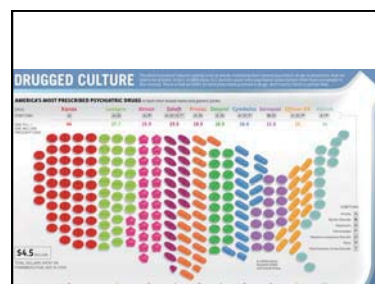
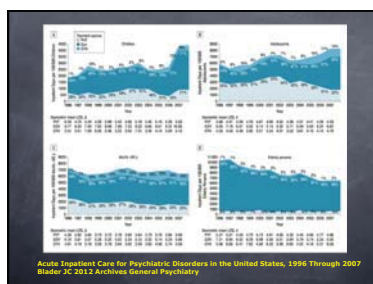
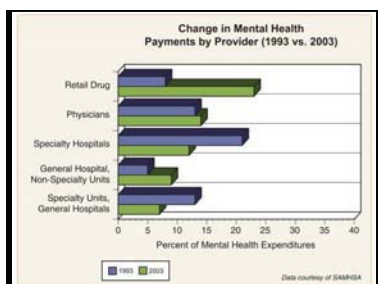
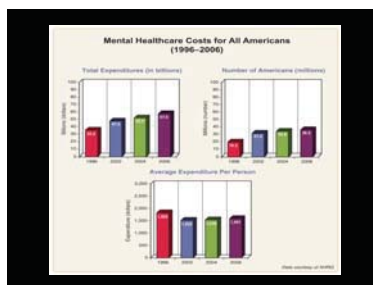
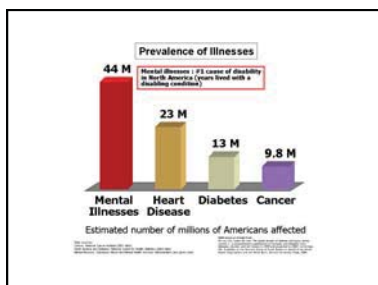
"Nature is an infinite sphere, the center of which is everywhere, the circumference is nowhere".

BLAISE PASCAL



Deity	Vairocana	Akshobya	Ratnasambhava	Amitaba	Amoghasiddhi
Direction	Center	East	South	West	North
Element	Space	Water	Earth	Fire	Air
Color	White	Blue/Purple	Yellow	Red	Green
Syllable	Pad	Hum	Om	Me	Ma

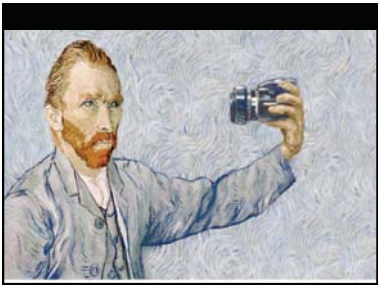
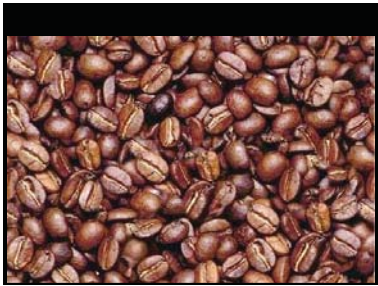
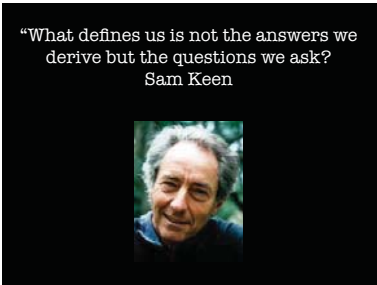
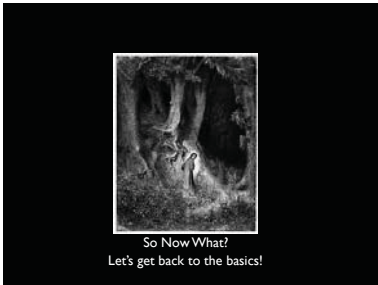
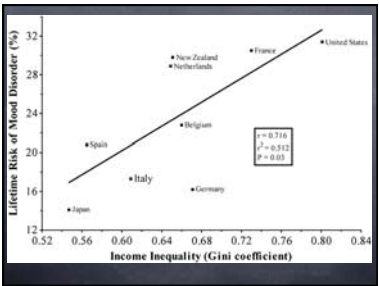
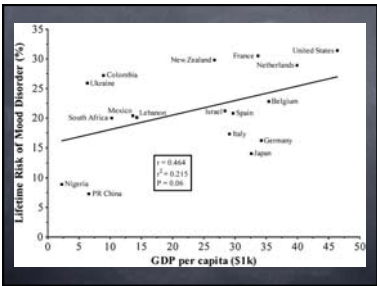


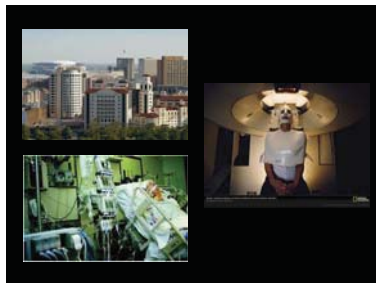
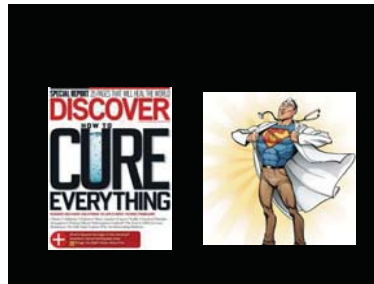


FACING THE BRUTAL FACTS

- Antidepressants are only more effective than placebo in severe depression.¹
- The efficacy CBT and IPT (as opposed to supportive companionship) remains uncertain.

¹ Bower et al. Antidepressant drug effects and depression severity: a patient-level meta-analysis. JAMA 2011;305:47-55.
² Solberg et al. Psychopharmacology for depression in adults: a meta-analysis of randomized evidence studies. J Gen Intern Med 2011.





What is Integrative Medicine?

- Patient and practitioner are partners in the healing process.
- All factors that influence health, wellness, and disease are taken into consideration, including mind, spirit, and community, as well as the body.
- Appropriate use of both conventional and alternative methods facilitates the body's innate healing response.
- Effective interventions that are natural and less invasive should be used whenever possible.
- Integrative medicine neither rejects conventional medicine nor accepts alternative therapies uncritically.
- Good medicine is based in good science. It is inquiry-driven and open to new paradigms.
- Alongside the concept of treatment, the broader concepts of health promotion and the prevention of illness are paramount.
- Practitioners of integrative medicine should exemplify its principles and commit themselves to self-exploration and self-development.

Characteristic	Reduction	System-Oriented Approach
People	Behavior of a biological system can be explained by the properties of its constituent parts	Biological systems possess emergent properties that are only possessed by the system as a whole and not by any isolated part of the system
Approach	Reductive, top-down	Network
Assessment	One factor is singled out for attention and is given explanatory weight in the model	Many factors are simultaneously evaluated to assess the dynamics of the system
Clinical focus	Reductionist clinical focus	One, open context
Model/phenomena	Linear, predictable, frequently deterministic	Non-linear, sensitive to initial conditions, stochastic (probabilistic), chaotic
Medical concepts	Health is normality	Health is robustness
	Health is risk reduction	Health is adaptive plasticity
	Health is homeostasis	Health is homeodynamics

Ahn et al. PLoS 2006

- Acupuncture
- Naturopathy
- Chiropractic and Physical Therapy
- Shiatsu and Swedish Massage
- CBT
- Sensate Experimenting
- Zone Balancing
- Reiki
- Biofeedback and Neurofeedback
- Hydrotherapy
- EMDR
- Equine Therapy



A photograph showing a large group of people, possibly a choir or a group of performers, standing in a long line on a grassy field. They are all wearing dark clothing. In the background, there are rolling hills and mountains under a clear blue sky.

- What treatment?
- For which patients?
- At what stage of their disease?
- How Often?

A photograph showing a large herd of cattle grazing in a green field. In the background, there are mountains under a clear sky.

Contemplative Model of Health and Disease

"It is not the strongest of the species that survives, but rather the one most responsive to change."
Charles Darwin

ATTENTION

Harmony
(Homeostasis/
Homeodynamics)
Hermesis

Disharmony
(Allostasis)
Dysregulation
(Allostatic load)

Disease

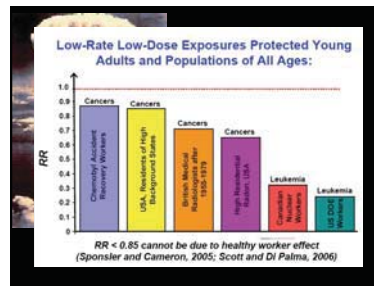
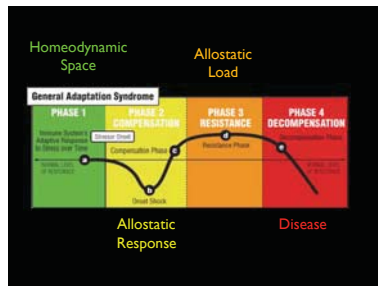
Disintegration

KEY TERMS

The New Lexicon of Integrative Medicine

- Homeodynamic Space
- Hormesis (Resilience)
- Allostasis
- Allostatic Load
- Disease

The graph illustrates the relationship between hormone levels and exercise salience. The y-axis represents 'INCREASED EXERCISE SALIENCE' and the x-axis represents 'HORMONES', with markers for 'LOW HORMONES', 'INCREASING HORMONES', and 'HIGH HORMONES'. A green curve peaks at 'OPTIMAL HORMONES' and is labeled 'HEALTHY'. A red curve dips below the green one, labeled 'UNHEALTHY', and a shaded area between them is labeled 'TIPPING POINT ZONE'. Numbered points 1-11 are marked along the curves.



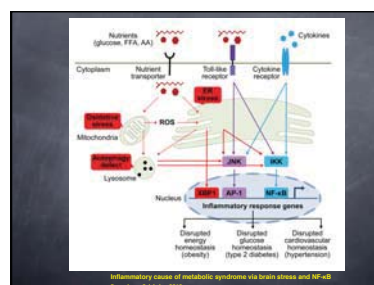
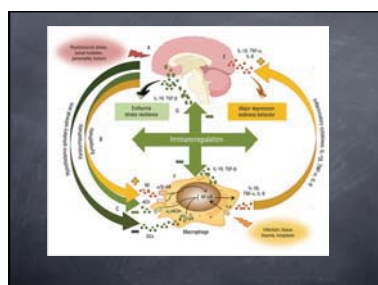
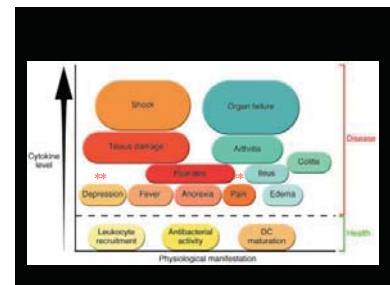
Indicators of Green Zone Capacity

- Inflammatory Markers (cytokines, homocysteine, CRP)
- HRV and Sinus Arrhythmia
- Telomere length and Telomerase Activity
- Biometrics (waist, BMI, exercise tolerance)

HEALTHSPAN
not
LIFESPAN

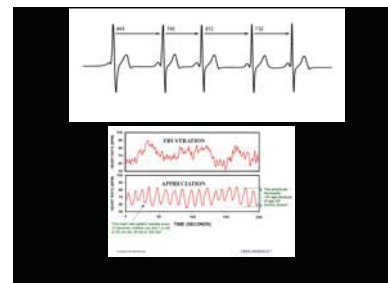
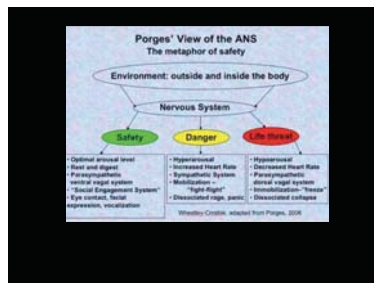
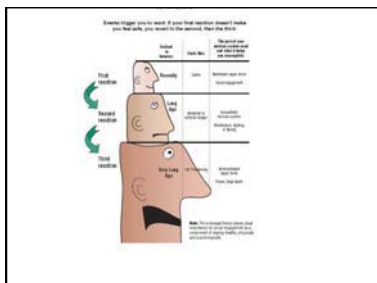
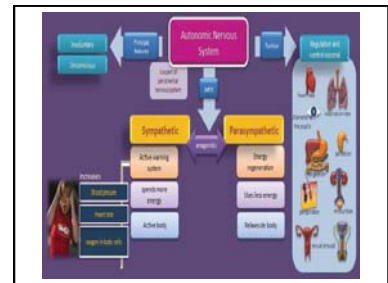
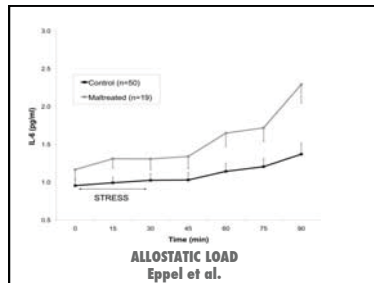
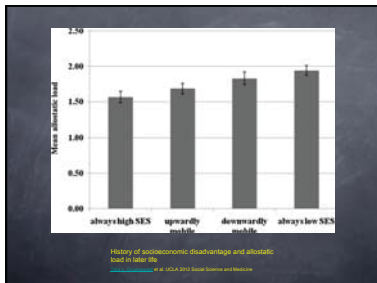
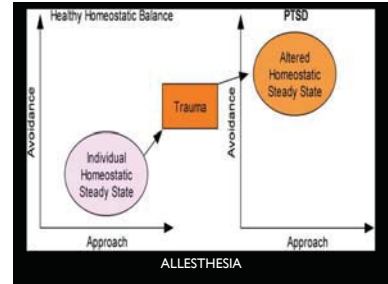
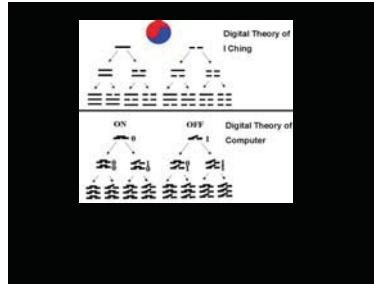
RED ZONE PROCESSES

- Inflammation
- Oxidation
- Glycation
- Methylation



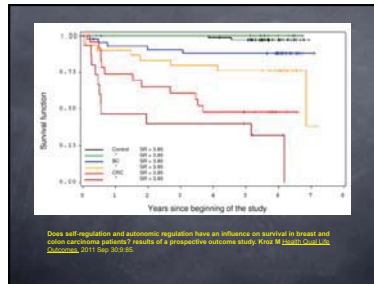
Balance is the Key to Life

LIFE IS A BINARY SYSTEM

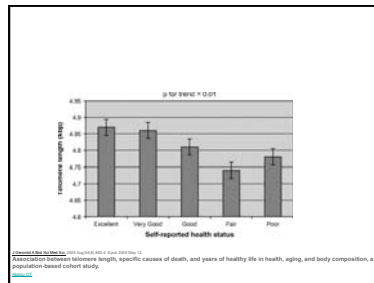
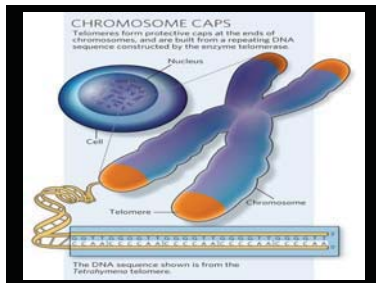


HRV in Psychiatric Disorders

- HRV decreased in depression (correlation with degree of depression) (Kemp et al. 2010 Biol Psychiatry)
- No change after treatment with SSRI (despite improvement in symptoms) (Kemp et al. 2010 Biol Psychiatry)
- Further decrease in HRV after treatment with TCA (Kemp et al. 2010 Biol Psychiatry)
- Generalized anxiety associated with decreased HRV (Licht C, et al. Psychosomatic Medicine 2009)
- Decreased HRV in depression is mediated by social contact. (Schwederfeger et al. Health Psychology 2009)
- HRV is more decreased in response to a stressor in depressed subjects (Hughes et al. Psychosomatics, 2009)
- PTSD associated with decreased HRV at baseline and in response to positive and negative stimuli



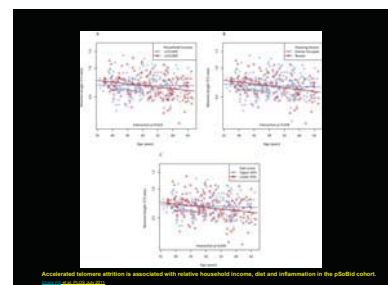
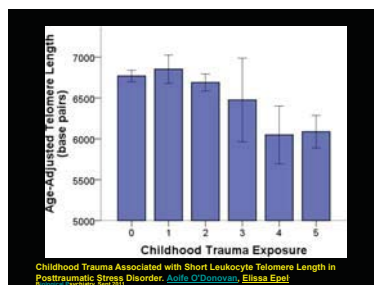
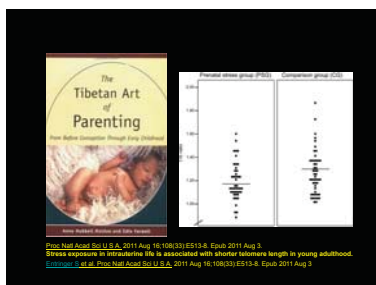
Newton's Alchemy?

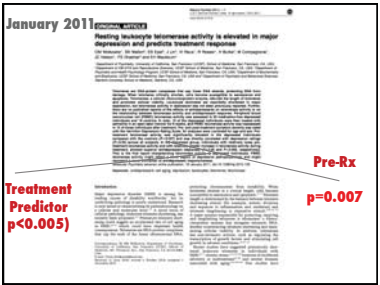
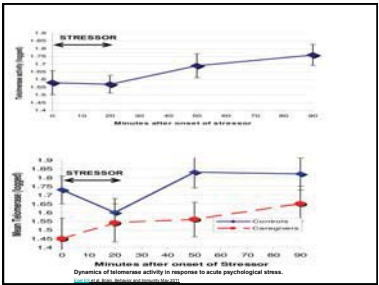
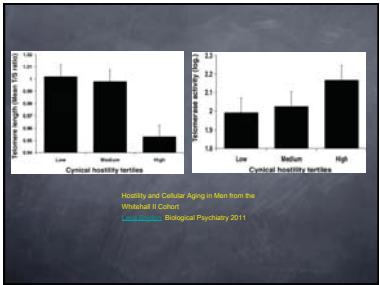
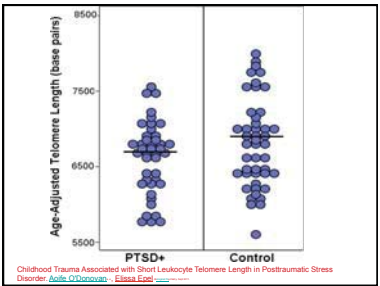
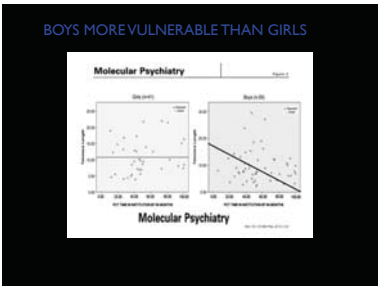
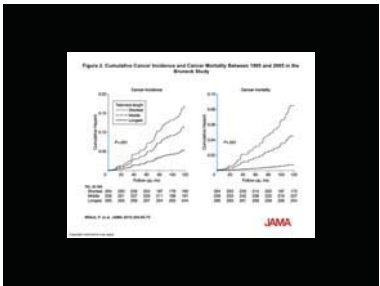


Systemic inflammatory markers as predictors of short leukocyte telomere length

Variable	Adjusted for age, gender and race		Adjusted for all variables	
	OR	95% CI	OR	95% CI
CRP	1.2	1.04-1.37	1.2	1.04-1.37
IL-6	1.1	1.04-1.17	1.1	1.04-1.17
IL-1	1.1	1.04-1.17	1.1	1.04-1.17
IL-18	1.1	1.04-1.17	1.1	1.04-1.17
IL-17	1.1	1.04-1.17	1.1	1.04-1.17
IL-10	1.1	1.04-1.17	1.1	1.04-1.17
IL-12	1.1	1.04-1.17	1.1	1.04-1.17
IL-13	1.1	1.04-1.17	1.1	1.04-1.17
IL-14	1.1	1.04-1.17	1.1	1.04-1.17
IL-15	1.1	1.04-1.17	1.1	1.04-1.17
IL-16	1.1	1.04-1.17	1.1	1.04-1.17
IL-17	1.1	1.04-1.17	1.1	1.04-1.17
IL-18	1.1	1.04-1.17	1.1	1.04-1.17
IL-19	1.1	1.04-1.17	1.1	1.04-1.17
IL-20	1.1	1.04-1.17	1.1	1.04-1.17
IL-21	1.1	1.04-1.17	1.1	1.04-1.17
IL-22	1.1	1.04-1.17	1.1	1.04-1.17
IL-23	1.1	1.04-1.17	1.1	1.04-1.17
IL-24	1.1	1.04-1.17	1.1	1.04-1.17
IL-25	1.1	1.04-1.17	1.1	1.04-1.17
IL-26	1.1	1.04-1.17	1.1	1.04-1.17
IL-27	1.1	1.04-1.17	1.1	1.04-1.17
IL-28	1.1	1.04-1.17	1.1	1.04-1.17
IL-29	1.1	1.04-1.17	1.1	1.04-1.17
IL-30	1.1	1.04-1.17	1.1	1.04-1.17
IL-31	1.1	1.04-1.17	1.1	1.04-1.17
IL-32	1.1	1.04-1.17	1.1	1.04-1.17
IL-33	1.1	1.04-1.17	1.1	1.04-1.17
IL-34	1.1	1.04-1.17	1.1	1.04-1.17
IL-35	1.1	1.04-1.17	1.1	1.04-1.17
IL-36	1.1	1.04-1.17	1.1	1.04-1.17
IL-37	1.1	1.04-1.17	1.1	1.04-1.17
IL-38	1.1	1.04-1.17	1.1	1.04-1.17
IL-39	1.1	1.04-1.17	1.1	1.04-1.17
IL-40	1.1	1.04-1.17	1.1	1.04-1.17
IL-41	1.1	1.04-1.17	1.1	1.04-1.17
IL-42	1.1	1.04-1.17	1.1	1.04-1.17
IL-43	1.1	1.04-1.17	1.1	1.04-1.17
IL-44	1.1	1.04-1.17	1.1	1.04-1.17
IL-45	1.1	1.04-1.17	1.1	1.04-1.17
IL-46	1.1	1.04-1.17	1.1	1.04-1.17
IL-47	1.1	1.04-1.17	1.1	1.04-1.17
IL-48	1.1	1.04-1.17	1.1	1.04-1.17
IL-49	1.1	1.04-1.17	1.1	1.04-1.17
IL-50	1.1	1.04-1.17	1.1	1.04-1.17
IL-51	1.1	1.04-1.17	1.1	1.04-1.17
IL-52	1.1	1.04-1.17	1.1	1.04-1.17
IL-53	1.1	1.04-1.17	1.1	1.04-1.17
IL-54	1.1	1.04-1.17	1.1	1.04-1.17
IL-55	1.1	1.04-1.17	1.1	1.04-1.17
IL-56	1.1	1.04-1.17	1.1	1.04-1.17
IL-57	1.1	1.04-1.17	1.1	1.04-1.17
IL-58	1.1	1.04-1.17	1.1	1.04-1.17
IL-59	1.1	1.04-1.17	1.1	1.04-1.17
IL-60	1.1	1.04-1.17	1.1	1.04-1.17
IL-61	1.1	1.04-1.17	1.1	1.04-1.17
IL-62	1.1	1.04-1.17	1.1	1.04-1.17
IL-63	1.1	1.04-1.17	1.1	1.04-1.17
IL-64	1.1	1.04-1.17	1.1	1.04-1.17
IL-65	1.1	1.04-1.17	1.1	1.04-1.17
IL-66	1.1	1.04-1.17	1.1	1.04-1.17
IL-67	1.1	1.04-1.17	1.1	1.04-1.17
IL-68	1.1	1.04-1.17	1.1	1.04-1.17
IL-69	1.1	1.04-1.17	1.1	1.04-1.17
IL-70	1.1	1.04-1.17	1.1	1.04-1.17
IL-71	1.1	1.04-1.17	1.1	1.04-1.17
IL-72	1.1	1.04-1.17	1.1	1.04-1.17
IL-73	1.1	1.04-1.17	1.1	1.04-1.17
IL-74	1.1	1.04-1.17	1.1	1.04-1.17
IL-75	1.1	1.04-1.17	1.1	1.04-1.17
IL-76	1.1	1.04-1.17	1.1	1.04-1.17
IL-77	1.1	1.04-1.17	1.1	1.04-1.17
IL-78	1.1	1.04-1.17	1.1	1.04-1.17
IL-79	1.1	1.04-1.17	1.1	1.04-1.17
IL-80	1.1	1.04-1.17	1.1	1.04-1.17
IL-81	1.1	1.04-1.17	1.1	1.04-1.17
IL-82	1.1	1.04-1.17	1.1	1.04-1.17
IL-83	1.1	1.04-1.17	1.1	1.04-1.17
IL-84	1.1	1.04-1.17	1.1	1.04-1.17
IL-85	1.1	1.04-1.17	1.1	1.04-1.17
IL-86	1.1	1.04-1.17	1.1	1.04-1.17
IL-87	1.1	1.04-1.17	1.1	1.04-1.17
IL-88	1.1	1.04-1.17	1.1	1.04-1.17
IL-89	1.1	1.04-1.17	1.1	1.04-1.17
IL-90	1.1	1.04-1.17	1.1	1.04-1.17
IL-91	1.1	1.04-1.17	1.1	1.04-1.17
IL-92	1.1	1.04-1.17	1.1	1.04-1.17
IL-93	1.1	1.04-1.17	1.1	1.04-1.17
IL-94	1.1	1.04-1.17	1.1	1.04-1.17
IL-95	1.1	1.04-1.17	1.1	1.04-1.17
IL-96	1.1	1.04-1.17	1.1	1.04-1.17
IL-97	1.1	1.04-1.17	1.1	1.04-1.17
IL-98	1.1	1.04-1.17	1.1	1.04-1.17
IL-99	1.1	1.04-1.17	1.1	1.04-1.17
IL-100	1.1	1.04-1.17	1.1	1.04-1.17

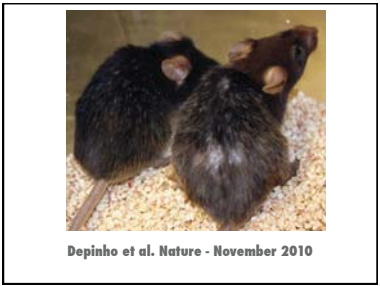
Cumulative inflammatory load is associated with short leukocyte telomere length in the Health, Aging and Body Composition Study. *Tomasson et al. PLoS One May 2011*





LETTER
Telomerase reactivation reverses tissue degeneration in aged telomerase-deficient mice

The JAMA logo is visible in the bottom right corner.



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Length to Your Telomeres!**

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TA65

Telomere Health

Genomic Comparison of the Ants *Camponotus floridanus* and *Harpegnathos saltator*

Genomic comparison of the ants *Camponotus floridanus* and *Harpegnathos saltator* reveals that the two species share a common ancestor and that the two species have diverged significantly in their genomes. The study found that the two species have a similar number of genes, but that the genes are arranged differently in the genome. This suggests that the two species have evolved differently in terms of their genome organization. The study also found that the two species have a similar number of chromosomes, but that the chromosomes are arranged differently in the karyotype. This suggests that the two species have evolved differently in terms of their chromosome organization. The study provides a comprehensive genomic comparison of the two species, which will help to understand the evolutionary relationships between the two species and the mechanisms of genome evolution in ants.

EPIGENETIC EFFECTS

CANCER

NEURAL CHANGES

BRAIN DISORDERS

CHRONIC DISEASES



Worker

Queen
(lifespan ten times longer mediated by telomerase and sirtuin epigenetic change)

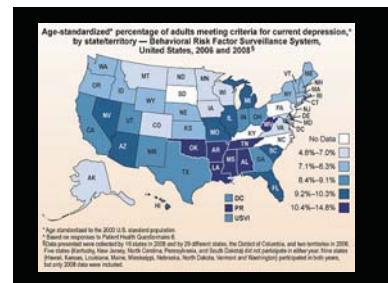
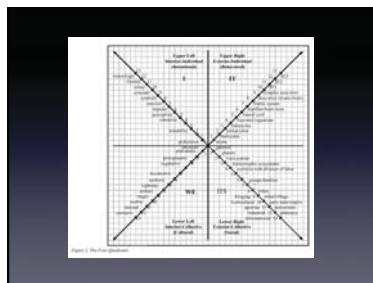
Camponotus floridanus
Carpenter Ant

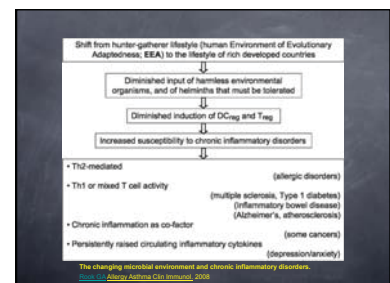
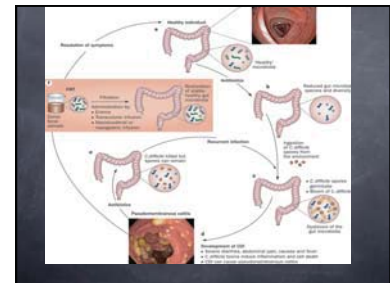
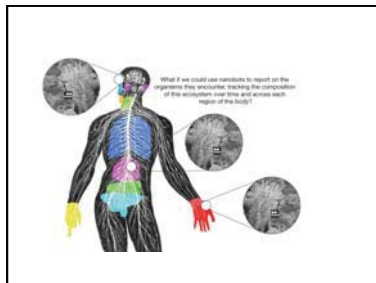
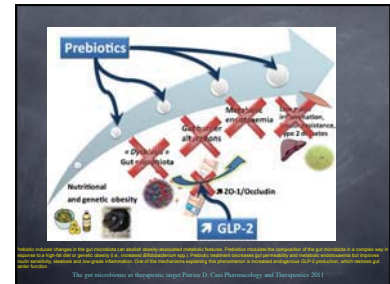
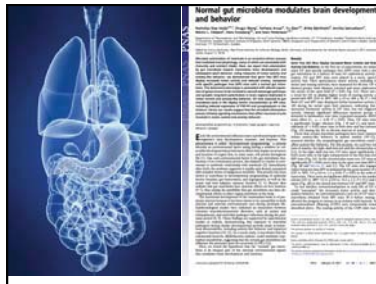


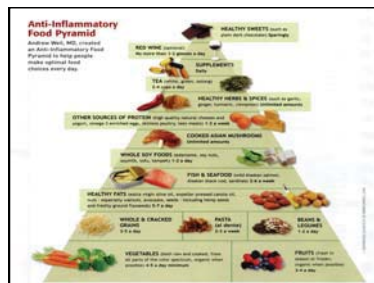
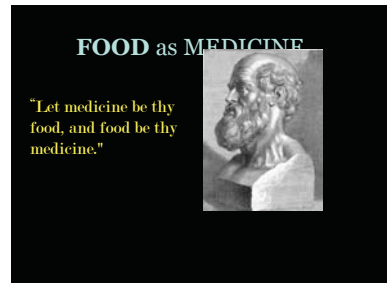
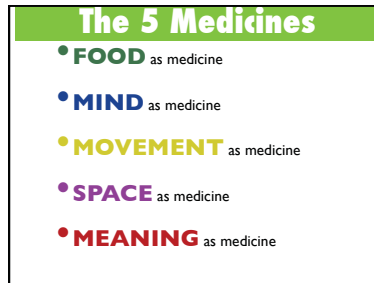
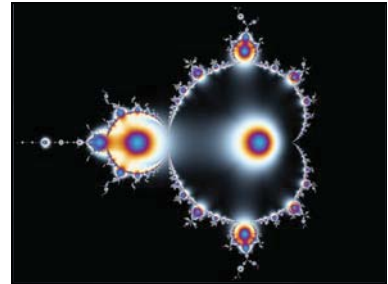
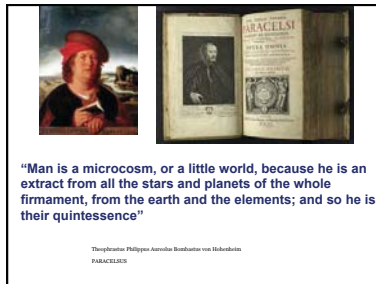
All in all
Each man in all men
all men in each man

As Above, So Below

All being in each being
Each being in all being
All in each
Each in all

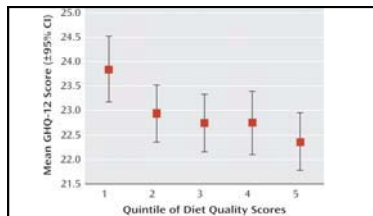




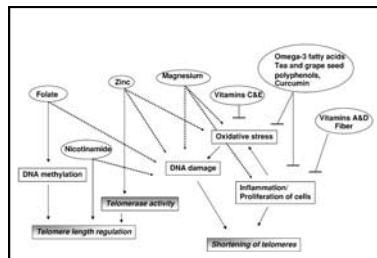


Association of the Mediterranean Dietary Pattern With the Incidence of Depression
 The Seguelandia Universidad de Navarra/University of Navarra Follow-up (SUN) Cohort

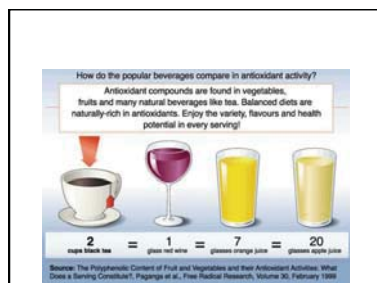
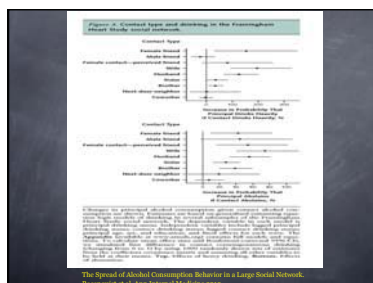
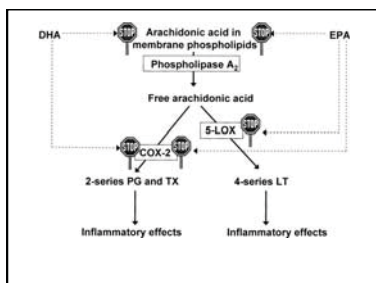
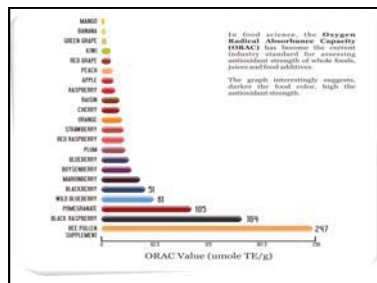
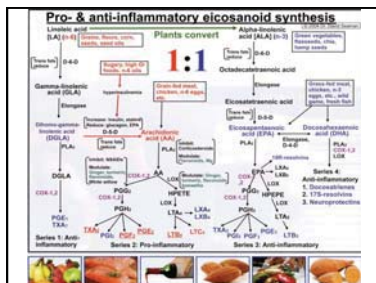
Alejandro Sánchez-Villago, Bilbao, PhD; Miguel Delgado-Rodríguez, MD, PhD, MFIH; Álvaro Alonso, MD, PhD; Javier Schiaffino, MD, PhD; Francisca Lahortiga, BA, PhD; Luis Serra-Majem, MD, PhD; Rafael Ángel Martínez-González, MD, PhD, MFIH

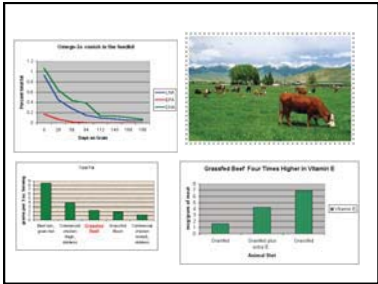


*A dietary pattern comprising vegetables, fruit, beef, lamb, fish, and whole-grain foods (traditional) was associated with a lower likelihood of depressive and anxiety disorders, whereas a dietary pattern comprising processed and "unhealthy" foods (western) was associated with a higher likelihood of psychological symptoms and disorders".



Diet, Nutrition and telomere Length. Journal of Nutritional Biochemistry. Paul L. 2011. In press





"Score Ten for Grass-Fed Beef" (USDA 2009)

1. Lower in total fat
2. Higher in beta-carotene
3. Higher in vitamin E (alpha-tocopherol)
4. Higher in the B-vitamins thiamin and riboflavin
5. Higher in the minerals calcium, magnesium, and potassium
6. Higher in total omega-3s
7. A healthier ratio of omega-6 to omega-3 fatty acids (1.65 vs 4.84)
8. Higher in CLA (cis-9 trans-11), a potential cancer fighter
9. Higher in vaccenic acid (which can be transformed into CLA)
10. Lower in the saturated fat linked with heart disease

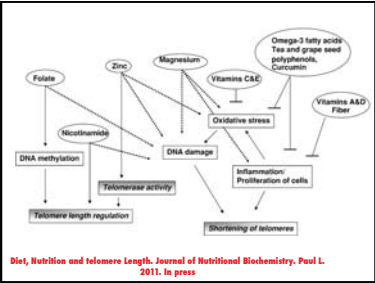
"Eat mostly food, not too much, nothing with a mother or four legs"

"Don't eat anything that is handed to you through a window"

"Avoid food that your grandmother would not recognize."

Table 3. Association between the Consumption of Each Component of the Score Built to Assess the Adherence to the Mediterranean Dietary Pattern and Risk of Depression

Component of the Score	Score	Mean (SD)	OR (95% CI)	P Value
Vegetables	1-4	1.00 (0.00)	1.00	
Fruit and olive oil	1-4	1.00 (0.00)	1.00	
Wine	1-4	1.00 (0.00)	1.00	
Grain	1-4	1.00 (0.00)	1.00	
Red and white meat	1-4	1.00 (0.00)	1.00	
Alcohol	1-4	1.00 (0.00)	1.00	
Adherence	1-4	1.00 (0.00)	1.00	

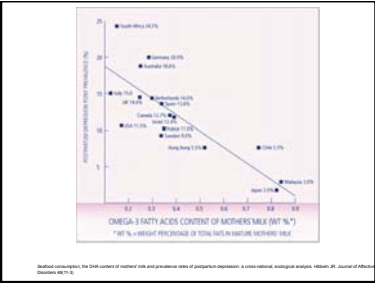


Dietary Supplements - The Vital Few (Maybe!)

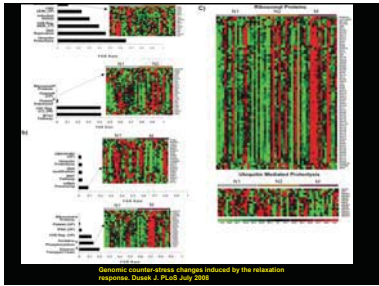
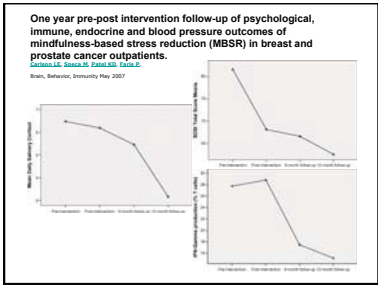
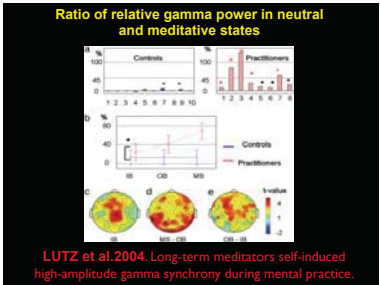
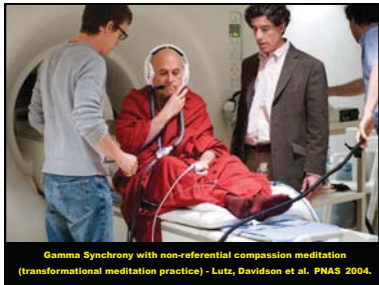
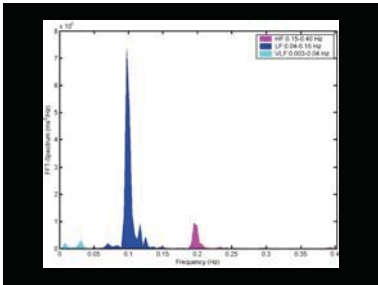
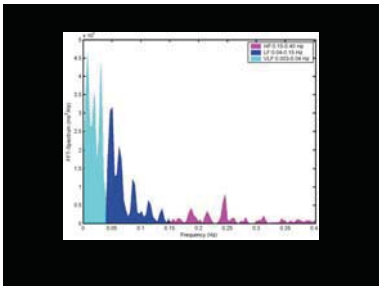
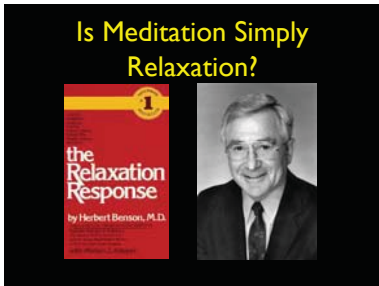
- Omega-3
- Vitamin D(3)
- Probiotics
- Curcumin
- Multivitamin (over 50)
- Adaptogen
- Resveratrol (TA 65) - Astragalus

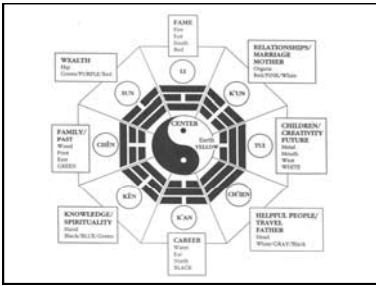
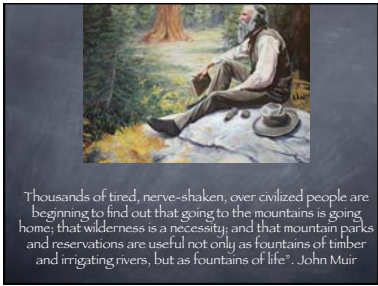
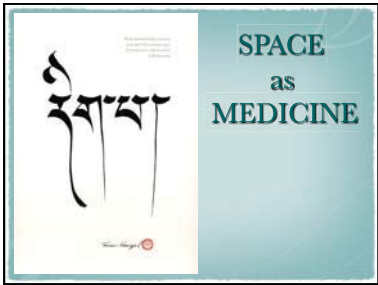
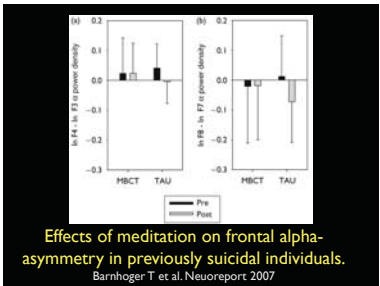
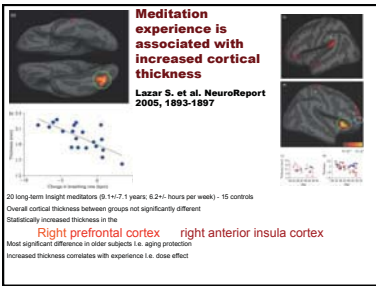
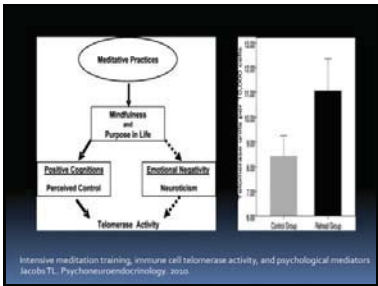
JAMA Fish Oils Slowed DNA Aging DNA "Telomere" Length Improves

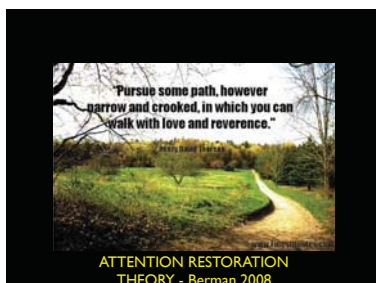
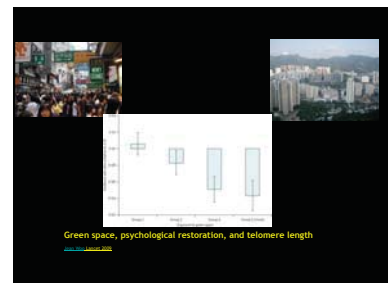
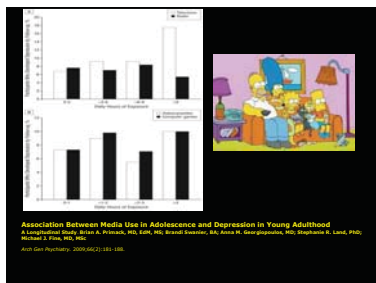
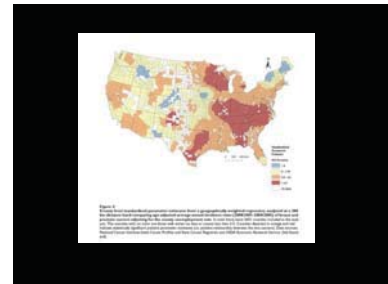
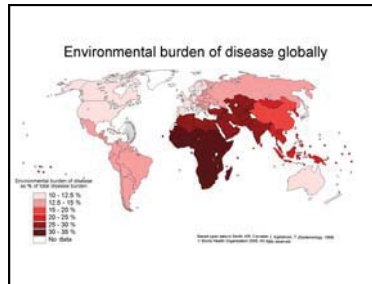
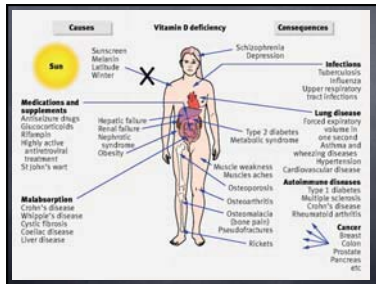
Abstract: Telomeres are repetitive DNA sequences at the ends of chromosomes that shorten with age. Shorter telomeres are associated with increased risk of age-related diseases. This study found that fish oil supplementation significantly improved telomere length in healthy adults.



Turmeric (Curcumin)



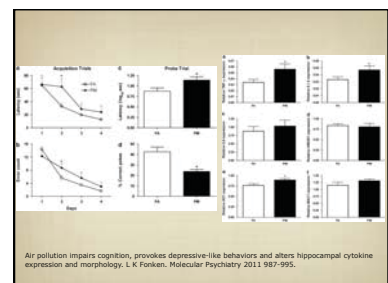


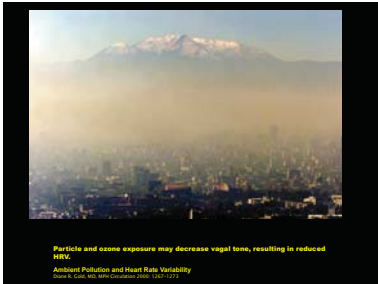


Directed Attention Fatigue Syndrome
Kaplan and deYoung

Journal: Environ Psychol. 2008;28(1):1-10.

Under continual demand our ability to direct our inhibitory processes tires... This condition reduces mental effectiveness and makes consideration of abstract long-term goals difficult. A number of symptoms are commonly attributed to this fatigue: irritability and impulsivity that results in regrettable choices, impatience that has us making ill-informed decisions, and distractibility that allows the environment to have a magnified effect on our behavioral choices*.





TOP 10 COMMON HOUSEHOLD TOXINS

- Bisphenol A (BPA)
- Oxybenzone
- Fluoride
- Carbamates
- Phthalates
- Butylated Hydroxytoluene (BHT)
- Sulfonic Acid (SFA)
- Perchlorate
- Dibutyltin Diethyl Ether (DECA)
- Asbestos

"An association was found between exposure to traffic and the onset of a myocardial infarction within one hour afterward (odds ratio, 2.82; 95 percent confidence interval, 2.22 to 3.63, P<0.001). The time the subjects spent in cars, on public transportation, or on motorcycles or bicycles was consistently linked with an increase in the risk of myocardial infarction".

Exposure to Traffic and the Onset of Myocardial Infarction
Kawachi S, Franks R, Franks R, et al. 2002; 114:100-108

MOVEMENT AS MEDICINE

Can Exercise Chase The Blues Away?

In a study of 14,500 people without mental illness, researchers found a dose-response relationship between fitness and prevalence of depression. In fact, each additional minute of physical activity lowered the likelihood of having depression by 1 percent.

Activity	Men	Women
Highly fit	48%	48%
Moderately fit	52%	52%
Not fit	57%	57%

Source: American Journal of Preventive Medicine, 2011; 46:1-10

