

## Integrative Medicine: *It's Not Alternative Anymore*



**Tieraona Low Dog, MD**

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## Faculty Disclosure

Tieraona Low Dog, MD, has nothing to disclose

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## Learning Objectives

- Participants will be able to describe the definitional differences between conventional, integrative, complementary and alternative medicine.
- Participants will be able to discuss current recommendations for nutritional counseling by physicians.
- Participants will be able to discuss the evidence for two mind-body therapies on human health.

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## More Money, Shorter Lives, Poorer Health

- The five leading causes are heart disease, cancer, chronic lower respiratory diseases, stroke, and unintentional injuries
- Each year, nearly 900,000 Americans die prematurely from the five leading causes of death
- “*Many of these risks are avoidable by making changes in personal behaviors.*”

May 1, 2014 Centers for Disease Control

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- If the American public embraced a healthier lifestyle:
  - *healthy nutrition*
  - *balance of exercise and rest*
  - *limited or no exposure to toxic chemicals*
  - *no smoking, no or moderate alcohol consumption*
  - *stress management*
  - *social integration*

93% of diabetes, 81% of heart attacks, 50% of strokes, and 36% of all cancers could be prevented.

Ford, et al *Arch Intern Med.* 2009; 169(15):1355-62.

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## The Future

- When reviewing the research in totality, it becomes increasingly clear that much of the modern burden of disease stems from lifestyle behaviors.
- Physician training must expand to incorporate more training in nutrition, exercise, environmental health, stress management, and motivational interviewing.

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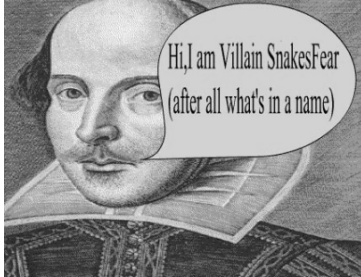
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Conventional, Allopathic, Biomedical,  
Integrative, Complementary, Alternative



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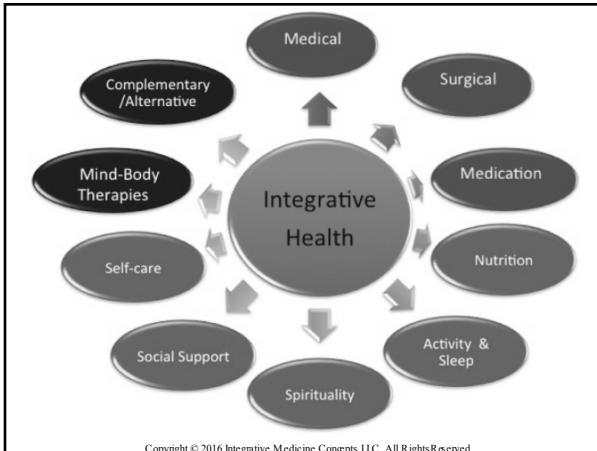
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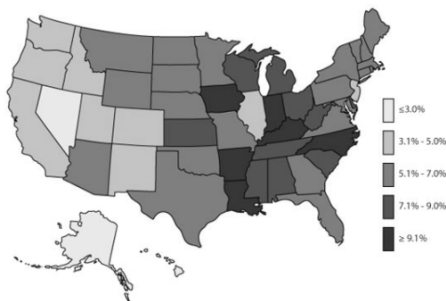
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Children on ADHD Medication  
(2011-12)



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### Inattentive Presentation: At least 6 of following:

- Fails to give close attention to details or makes careless mistakes.
- Has difficulty sustaining attention.
- Does not appear to listen.
- Struggles to follow through on instructions.
- Has difficulty with organization.
- Avoids or dislikes tasks requiring a lot of thinking.
- Loses things.
- Is easily distracted.
- Is forgetful in daily activities.

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### Hyperactive-Impulsive At least 6 of following:

- Fidgets with hands or feet or squirms in chair.
- Has difficulty remaining seated.
- Runs about or climbs excessively in children; extreme restlessness in adults.
- Difficulty engaging in activities quietly.
- Acts as if driven by a motor; adults will often feel inside like they were driven by a motor.
- Talks excessively.
- Blurts out answers before questions have been completed.
- Difficulty waiting or taking turns.

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### Meds and ADHD



- 11% of school aged kids in US have ADHD diagnosis.
- 87% of children are prescribed medication, mostly methylphenidates (Ritalin) and amphetamines (such as Adderall). (15 have been approved for children)
- Meds can cause liver toxicity, weight loss, sleep problems, mood swings, and even thoughts of suicide. They can also interfere with growth.
- Between \$320- \$500 million spent annually in U.S. on medications for those inappropriately diagnosed ADHD.

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## Other Causes?



- Less effective parenting
- Everyone more stressed
- Higher demands on children
- Environmental toxins
- High carb, low nutrient diet, nutrient deficits

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- Children go to school after eating a bagel and orange juice, or sugary cereal, or pop-tarts –meals with no fat, no protein, and a high glycemic load.
- Blood sugar goes up and then comes crashing down. Stress hormones, poor focus, inability to concentrate result. Is this a surprise?

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## Iron Deficiency

- Iron deficiency remains common in young children (1-5 years) and women of reproductive age (12-49 years).
- Data from NHANES 2009-2010 showed low iron stores in 7% of children (ages 1-5) and 16% of women.
- Hispanic children greater risk for deficiency
- Iron deficiency increases risk of lead toxicity.
- DV of iron is 18 mg (pregnancy increases need)

[http://www.cdc.gov/nchs/data/factsheets/factsheet\\_nutrition.htm](http://www.cdc.gov/nchs/data/factsheets/factsheet_nutrition.htm)  
Brotanek JM, et al. Pediatrics 2007; 120(3):568-75.

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## Iron and Attention

- A 2010 meta-analysis in the *Nutrition Journal* that included 14 randomized controlled trials of children over the age of 6, adolescents, and adult women who had iron deficiency anemia found that iron supplementation *improved attention, concentration, and IQ*.
- Unusually low ferritin levels (mean: 18.4 ng/mL; 23% participants <7 ng/mL) in study of ADHD children in Iowa City explains the observed correlation with ADHD symptom scores

Falkingham M, et al. *Nutr J* 2010; 25:9-14.  
Calarge C, et al. *J Child Adolesc Psychopharmacol*. 2010; 20(6):495-502

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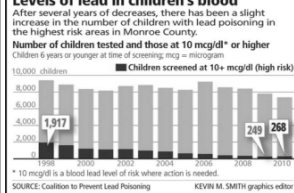
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## Levels of lead in children's blood



## Lead & Hyperactivity

- Low lead levels (< 5 µg/dL) have been associated with inattentive and hyperactivity symptoms and learning difficulties in school-age children.

5743.

Kim Y, et al. *Sci Total Environ* 2010; 408:5737-

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## Pesticide Exposure and ADHD

- Pound for pound, children drink 2.5 times more water, eat 3-4 times more food, and breathe 2 times more air. They are exposed to more pesticide.
- Using data from NHANES – children with typical levels of pesticide exposure from eating pesticide-treated fruits/vegetables, have higher risk of developing ADHD.
- Children ages 8-15 with higher urinary levels of dimethyl alkylphosphate (DMAP), had twice the odds of ADHD when compared with children with low or undetectable levels.
- Organophosphate exposure, at levels common among US children, may contribute to ADHD prevalence.

Kuehn BM. *JAMA*. 2010 Jul 7;304(1):27-8.  
Bouchard, et al. *Pediatrics*. 2010 Jun;125(6):e1270-7.

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*"If we are going to live so intimately with these [agricultural] chemicals--eating and drinking them--taking them into the very marrow of our bones--we had better know something about their nature and their power."*



Rachel Carson  
*Silent Spring*

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- The consumption of an organic diet for one week significantly reduced OP pesticide exposure in adults as measured by urinary metabolites.
- Mean total OP metabolites in the organic phase were 89% lower than when participants were eating conventional foods.
- Similar results have been shown in children.

Oates L, et al. Environ Res 2014;132:105-11  
Bradman A, et al. Environ Health Perspect 2015;123(10):1086-93

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<http://www.ewg.org/foodnews/>



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- Meditation interventions are being increasingly implemented among youth in school, community, and clinic based settings
- Review of 16 studies found that sitting meditation can be an effective intervention for psychosocial, and behavioral problems among children and adolescents.

Black DS, et al. Pediatrics 2009; 124(3):e532-41

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## Neurofeedback



- 104 children (7-11 years) with ADHD randomly assigned to receive in school 40-session computer training intervention: neurofeedback, cognitive training, or control condition and evaluated six months post-intervention.
- Neurofeedback participants made more prompt and greater improvements in ADHD symptoms, which were sustained at the 6-month follow-up. CT and control groups both had increased med dosing during follow up.

Steiner NJ, et al. Pediatrics 2014;133(3):483-92

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## Nutrition Counseling



- Both Healthy People 2010 and U.S. Preventive Task Force identified the need for physicians to address nutrition with patients.
- 2010 objective was to increase to 75% the proportion of office visits that included ordering or providing diet counseling for patients with a diagnosis of CVD, HTN, or diabetes.
- At midcourse review, the proportion actually declined from 42% to 40%.

Kolasa KM, et al. Nutr Clin Pract 2010 Oct;25(5):502-9.

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## The Questions are Endless



- Should my 4 year old eat fish? What kind? Should I give him cod liver oil? Will eliminating milk help eczema? What kind of probiotics should we use? Is organic produce really better? What is BPA? Should vegetarians take a multivitamin? How can I lose weight? Is juice okay for my 3 year old? How can I tell if something is “whole grain?”

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## Nutrition in the 21<sup>st</sup> Century



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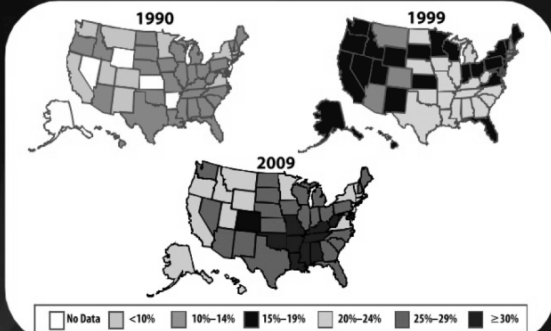
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## Rapid Increases in Adult Obesity in the U.S. BRFSS: 1990, 1999, 2009



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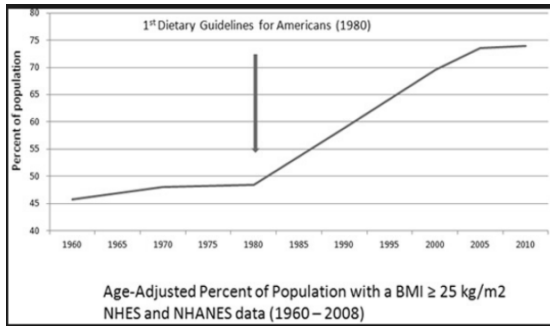
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## Diet and Obesity in US



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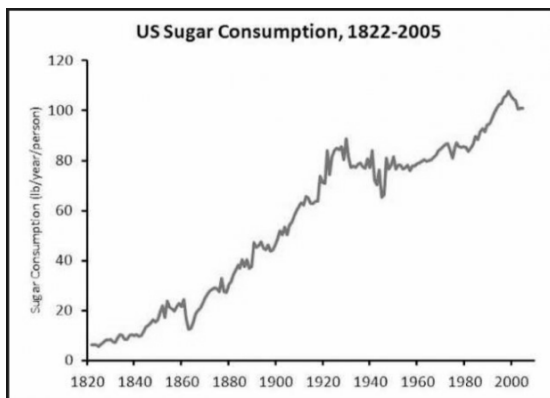
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## Reality Check



- Cutting back on processed, refined carbohydrates and sugary foods is one of the most practical and powerful things you can do to improve your dietary health.

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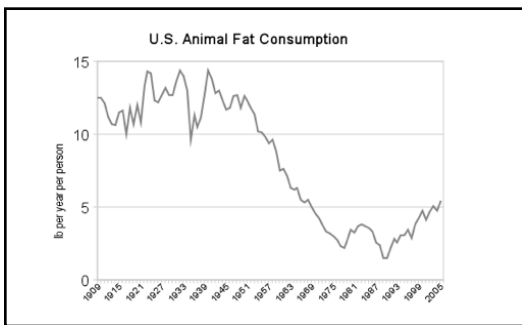
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## Does Eating Fat Give You Heart Disease?



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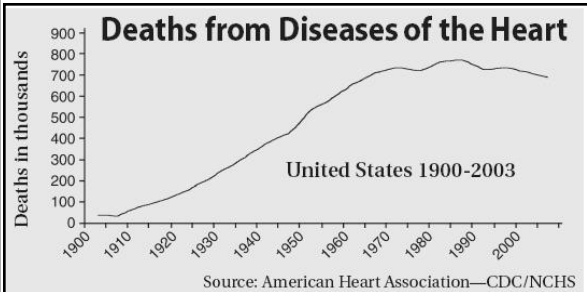
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## Saturated Fat Debate



- Three large meta analyses (21 studies, 12 studies, and 76 studies) have all failed to show any significant evidence that saturated fat increases the risk for heart disease.
- They also failed to find any significant evidence that increasing polyunsaturated fats and decreasing saturated fats lowers your heart risk.

Siri-Tarino, Amer J Clin Nutr 2010;91 (3):535-46.  
Schwingshackl L, et al. *BMJ Open* 2014;4(4):e004487.  
Chowdhury R, et al. *Ann Intern Med* 2014;160(6):398-406.

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## WCRF/AICR Recommendations to **Reduce Cancer Risk**

- Limit consumption of red meats (beef, pork, lamb) and avoid processed meats.
- Strive for less than *18 ounces per week* of red meat.



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## Meat and Dairy

- Look for unprocessed, nitrite free, low sodium
  - Avoid lunchmeats, prepackaged smoked meats
- Look for certifications:
  - Animal Welfare Approved
  - Certified Humane
  - Global Animal Partnership
  - Food Alliance
- These certifications ensure animals were raised humanely, without growth hormones or antibiotics

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## HEALTHY PROTEIN SOURCES

- Soy and other legumes (lentils, beans, etc)
- Nuts and seeds
- Low mercury cold water fish
- Organic poultry
- Grass fed beef, pork, lamb
- Wild game
- Milk and dairy without hormones
- Omega 3 enriched eggs

*Roughly 8 grams of protein per 20 pounds of body weight is generally recommended*

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## Environmental Toxins Impact Us All



- 80,000 chemicals have been created since WW II; 2,800 are high production volume chemicals that exceed 1 million pounds/year.
- Less than 20% of these chemicals have been tested for their possible toxicity to children.

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## Unique Susceptibilities of Children

- Exploratory behavior
- Crawling
- Hand to mouth activity
- Restricted diet
- Teens – work, hobbies, high risk behaviors



Children differ physiologically:

- Still growing and developing
- Absorption, metabolism, and elimination differences
- Blood-brain barrier still forming in young infants

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## Insecticides and Cancer

- Meta-analysis of 16 studies found childhood exposure to indoor residential insecticides associated with a significant increased risk of childhood leukemia and lymphomas.
- Positive but not statistically significant association also found for childhood brain tumors.

Chen M, et al. Pediatrics 2015; 136(4):719-29.

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## Integrated Pest Management

- IPM focuses on nontoxic and less toxic methods to control pest problems.
- Benefits include: reducing number of pests, reducing number of pesticide applications, lower cost while protecting human health.
- IPM in schools has been recommended by the USDA, EPA, American Public Health Association, and National PTA.

[www.epa.gov/managing-pests-schools/introduction-integrated-pest-management](http://www.epa.gov/managing-pests-schools/introduction-integrated-pest-management)

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## Mercury

- Bacteria in water can transform inorganic mercury into bio-active, organic methylmercury, which can then concentrate to very high levels in fish.
- US Geological Survey of 291 freshwater streams found 100% of larger fish positive for significant mercury levels. Walleye from lakes very high.
- Asian American and Native American women found to have higher levels of serum mercury.

Scudder BC, et al. U.S. Geological Survey Scientific Investigations Report 2009-5109, 74p.  
Foran JA, et al. J Environ Public Health 2010; 2010:802584.

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## Heavy Metals in Pregnancy

- Heavy metals cadmium, mercury, lead, and selenium readily cross the placental barrier.
- Inner city cohort found mercury cord RBC levels were 1.5 times greater than maternal RBC levels.
- Higher mercury levels associated with preterm births, low birth weight and lower IQ.
- Mercury exposure from both fish consumption and environmental contamination.

Chen Z, et al. J Expo Sci Environ Epidemiol 2014;24(5):537-44.  
Solari TD, et al. J Perinat Med 2014;42(6):725-9.

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## EWG Seafood Calculator

CATEGORY	SPECIES	WEEKLY MERCURY	SUSTAINABILITY	CONCLUSION
<b>EWG'S BEST BETS</b> Very High Omega-3s, Low Mercury, Sustainable	SALMON	30%	Best Choice: Wild Alaska	
	SARDINES	48%	Best Choice: Pacific	
	MUSSELS	18%	Best Choice: Farmed	
	RAINBOW TROUT	30%	Best Choice: Farmed	
	ATLANTIC MACKEREL	24%	Best Choice: Not Trawled	
CATEGORY	SPECIES	WEEKLY MERCURY	SUSTAINABILITY	CONCLUSION
<b>MERCURY RISKS ADD UP</b> Pregnant Women And Children Should Limit Or Avoid	CANNED LIGHT TUNA	71%	Variable*	
	FLATFISH (Haddock, Sole, Flounder)	71%	Good Alternative*	

- Asks body weight, age, gender and if you have heart disease.
- Calculations based upon four ounce serving.
- Number of fish on right column is how many times you can eat per week if you eat no other seafood.

[www.ewg.org/research/ewg-consumer-guide-to-seafood-calculator](http://www.ewg.org/research/ewg-consumer-guide-to-seafood-calculator)

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## Bisphenol A



- Bisphenol A (BPA) is a known endocrine disruptor.
- BPA associated with increases in developmental disorders of the brain and nervous system in animals.
- Associated with obesity, diabetes, and CVD in adults.
- Recent study found that higher levels of urinary BPA were associated with a higher odds of obesity (BMI >9.5%) and abnormal waist circumference-to-height ratio in children ages 6-18.
- There is some evidence that prenatal exposure to BPA decreases respiratory function and increases persistent wheeze in children.

Eng DS, et al. Pediatrics 2013;132(3):e637-45.  
Spanier AJ, et al. JAMA Pediatr 2014;168(12):1131-7  
McGuinn LA, et al. Environ Res 2015;136:381-6.

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## Dental Sealants

- Resin-based dental sealants and composites contain a BPA derivative. Researchers examined urinary BPA measurements and oral examination data for 1,001 children aged 6 to 19 years from 2003-2004 NHANES.
- Children with 7 to 42 restorations had mean BPA concentrations 20% higher than those of children with no restorations, this *did not* reach statistical significance.

McKinney C, et al. *J Am Dent Assoc* 2014 Jul;145(7):745-50.

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## Canned Soup

- Researchers at the Harvard School of Public Health found that volunteers consuming one serving of canned soup each day for five days had a more than 1,000% increase in urinary BPA concentrations compared with when the same individuals consumed fresh soup daily for five days.

Carwile JL, et al. *JAMA* 2011;306(20):2218-20.

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## Ways to Limit Exposure

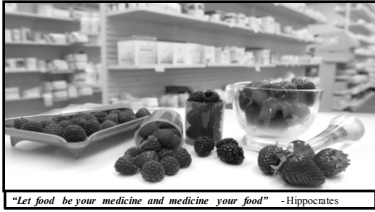


- Reduce use of canned foods.
- Eat fresh or frozen foods.
- Opt for glass packaging, especially for tomatoes.
- Don't microwave plastic.
- Don't store acidic foods in plastic. Use glass.
- Get rid of old/scratched plastic.
- Use BPA free water bottles.
- Powdered infant formula contains less BPA than liquid canned formula.

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## PREVENTION



"Let food be your medicine and medicine your food" -Hippocrates

The U.S. Centers for Disease Control and Prevention (CDC) estimates that eliminating three risk factors - poor diet, inactivity, and smoking - would prevent:

- 80% of heart disease and stroke
- 80% of type 2 diabetes
- 40% of cancers

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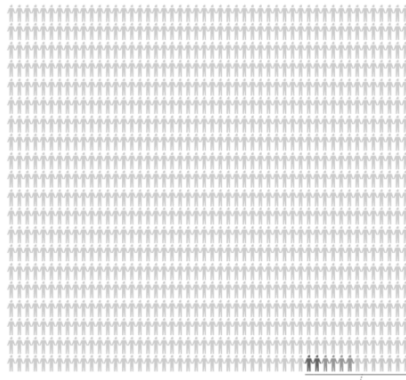
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### Effectiveness of statins

1,000 people taking **statins** for three years prevents



Prevents:

- 7 non fatal heart attacks
- 4 strokes
- 2 deaths

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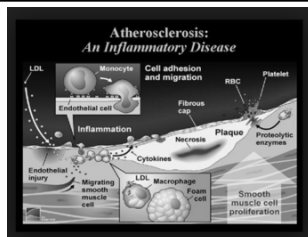
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- CAD is leading cause of death in US
- CAD was considered primarily a lipid accumulation mediated disease; now shown to involve an ongoing inflammatory response.

Christodoulidis G, et al. Cardiol Rev 2014 Jan 15

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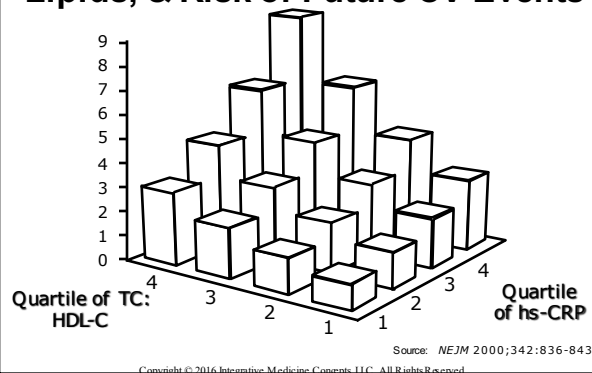
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### Women's Health Study: hs-CRP, Lipids, & Risk of Future CV Events




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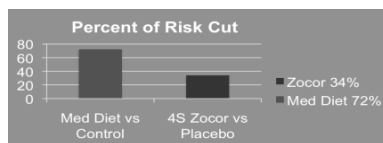
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### Mediterranean Diet

- Lyon Diet Heart Study – there was a 72% reduction in having another heart attack during 4 years of follow-up in those who had a heart attack.
- In 2013, the PREDIMED trial showing a significant risk reduction in a low-risk population.

de Lorgeril M, et al. *Circulation*. 1999;99:779-785  
Scandinavian Simvastatin Survival Study Group. *Lancet* 1994;344:1383-1389  
de Lorgeril M. *Curr Atheroscler Rep* 2013; Dec;15(12):370.




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### Exercise



- Men who run 1 hour or more per week reduce risk of heart disease by 42%.
- Studies suggest that active women have a 50% risk reduction in developing heart disease.
- Guidelines 60-90 minutes moderate exercise everyday if overweight.

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## A Nation on the Edge?



- According to CDC, 11% of Americans 12 and older take anti-depressant medications, a 400% increase from the 1980s, ~203 million prescriptions in 2011
- In 2011, ~63 million prescriptions for Xanax and Ativan (Xanax #1 psychiatric medication).
- Prevalence anxiety disorders ages 9 - 17 is 13%.
- 1 in 8 adolescents suffer from depression.

NCHS Data Brief Number 76, October 2011

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## Drugging the Mind

- Drug companies have had remarkable success in making psychotropic drugs part of everyday life.
- In 2009, antipsychotics reigned as the top-selling class of all medications in the USA, generating \$14.6 billion of revenue.
- Over-diagnosis and overtreatment of mental disorders is of particular concern because diagnostic decisions are based mostly on patient self-report, not on objective signs or laboratory tests

Balstra L, et al. Psychother Psychosom 2012;81:5-10

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## Publication Bias?

- 74 FDA-registered studies, 31% not published.
- According to published literature, 94% of trials conducted were positive.
- By contrast, FDA analysis showed that only 51% were positive.

Turner, et al. NEJM 2008 Jan 17;358(3):252-60

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## Effectiveness Questioned



- The magnitude of benefit for antidepressant medication compared with placebo may be *minimal or nonexistent*, on average, in patients with mild or moderate symptoms.
- For patients with very severe depression, the *benefit of medications over placebo is substantial*.

Fournier, et al. JAMA. 2010;303(1):47-53.

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Oh what to do, what to doooo???

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## Folate, B6 and B12



- In those over age 65, low levels of folate, B6 and B12 are associated with higher incidence of depression.
- 30 million Americans deficient in B6
- 18 million Americans deficient in B12
- Risk of vitamin B12 deficiency increases with age and in those:
  - ✓ Taking proton pump inhibitors or metformin
  - ✓ With gastric bypass surgery
  - ✓ With Crohn's disease
  - ✓ Who are vegans



Skarupski, et al. Am J Clin Nutr. 2010; 92(2):330-5;  
Kim JM, et al. Br J Psychiatry 2008; 192:268-74

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## Psychotherapy

- 125 studies reviewed:
  - Interpersonal psychotherapy, cognitive behavior therapy, and behavior therapy are all effective for treating major depressive disorder (MDD)
- *“Psychological interventions are as efficacious as and more enduring than medications in the treatment of MDD...”*

Hollon SD, et al. *Depress Anxiety* 2010; Sept9

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## Exercise and Mental Health



- The relationship between physical activity and mental health has been widely investigated and has been shown to reduce the harmful effects of stressors when performed at moderate intensities.
- The overwhelming evidence present in the literature today suggests that exercise ensures successful brain functioning.
- 92 studies 4310 participants for effect of physical activity on depression; 306 study effects with 10,755 participants for effect on anxiety concluded: physical activity reduces depression and anxiety.

Deslandes, et al. *Neuropsychobiology* 2009; 59(4):191-8  
Rehar AL, et al. *Health Psychol Rev* 2015; Mar 3:1-78

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## Social Isolation and Health



- 148 studies on effects of social isolation on health found it is:
  - As bad as smoking 15 cigarettes a day.
  - As dangerous as being an alcoholic.
  - As harmful as never exercising.
  - Twice as dangerous as obesity.

Holt-Lunstad J, et al. *PLoS Med* 2010; 7:e1000316

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*Call it a clan, call it a network, call it a tribe, call it a family. Whatever you call it, whoever you are, you need one.*

*~ Jane Howard*



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*“Only in the darkness, can we see the stars.”*

*~ Martin Luther King, Jr.*

- In truth, there is a lot we can't control in our lives, and there are often no easy fixes for the problems we face.
- Most of us were never given any tools to deal with the curve balls life throws at us.
- Having a purpose in life and positive affect may serve as a buffer against life challenges.

Stephens A, et al. Proc Natl Acad Sci 2005;102(18):6508-6512.

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## Mind Body Therapies

- Mind-body therapies are comprised of a variety of techniques with origins in Asian healing systems and Western psychological and medical therapies.
- They all are based upon a premise that inner directed experiential practice helps reduce tensions and stress originating in the mind and/or expressed in the body.
- Mind-body interventions, such as hypnosis, distraction and imagery, may be effective in managing procedure-related pain, anxiety, and distress in pediatric oncology.

Kanitz JL, et al. Complement Ther Med 2013; 21 Suppl 1:S20-5.  
Landier W, et al. JPediatr Nurs 2010; 25(6):566-79

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- Meditation practice is the deliberate self-regulation of attention in the present moment. Concentration, relaxation, altered states of consciousness, and maintenance of a self-observing attitude.
- Science suggests it can be a powerful tool for attention, regulating emotion, and increasing self-awareness and the cultivation of mindfulness.

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## Meditation

- Long-time meditators have greater activation of areas responsible for sustaining attention, processing empathy, integrating emotion and cognition, and perceiving the mental and emotional state of others.
- Review of 47 trials found meditation improves:
  - Anxiety
  - Depression
  - Pain

Goyal M, et al. JAMA Intern Med 2014;174(3):357-68

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## The Future

- Chronic illness now affects more than 50% of the American population and for the first time in history, future generations of children will likely not live as long as their grandparents.
- Without *early* intervention, the burden of chronic disease for both children and adults will continue to escalate dramatically over the coming decades.
- An integrated approach is the only one that really makes sense.....

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