



# Complementary Therapies for Heart Disease Management

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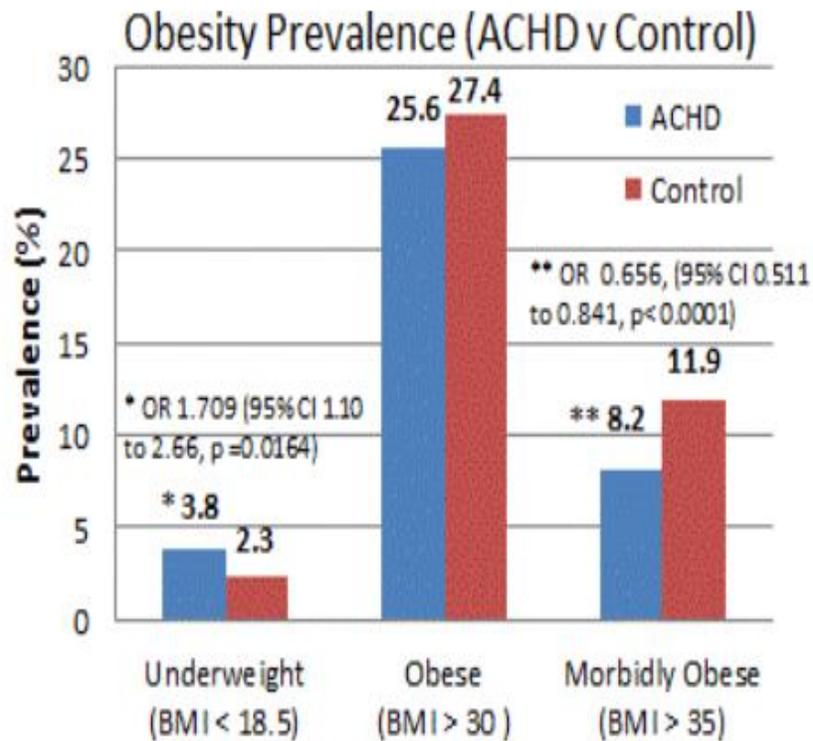
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# Prevalence of Heart Disease

- ▶ Coronary artery disease is becoming more prevalent in congenital heart disease patients as
  - ▶ Management of the illness has improved and patients are living longer
- ▶ As congenital heart disease patients are aging, the rates of coronary artery disease are equal to general population

Moons P, Deyk KV, Dedroog D, Troost E, Budts W. Prevalence of cardiovascular risk factors in adults with congenital heart disease. *European Journal of Cardiovascular Prevention & Rehabilitation*. 2006 Aug;13(4):612-6.

Giannakoulas G, Dimopoulos K, Engel R, Goktekin O, Kucukdurmaz Z, Vatankulu MA, Bedard E, Diller GP, Papaphylactou M, Francis DP, Di Mario C. Burden of coronary artery disease in adults with congenital heart disease and its relation to congenital and traditional heart risk factors. *The American journal of cardiology*. 2009 May 15;103(10):1445-50.

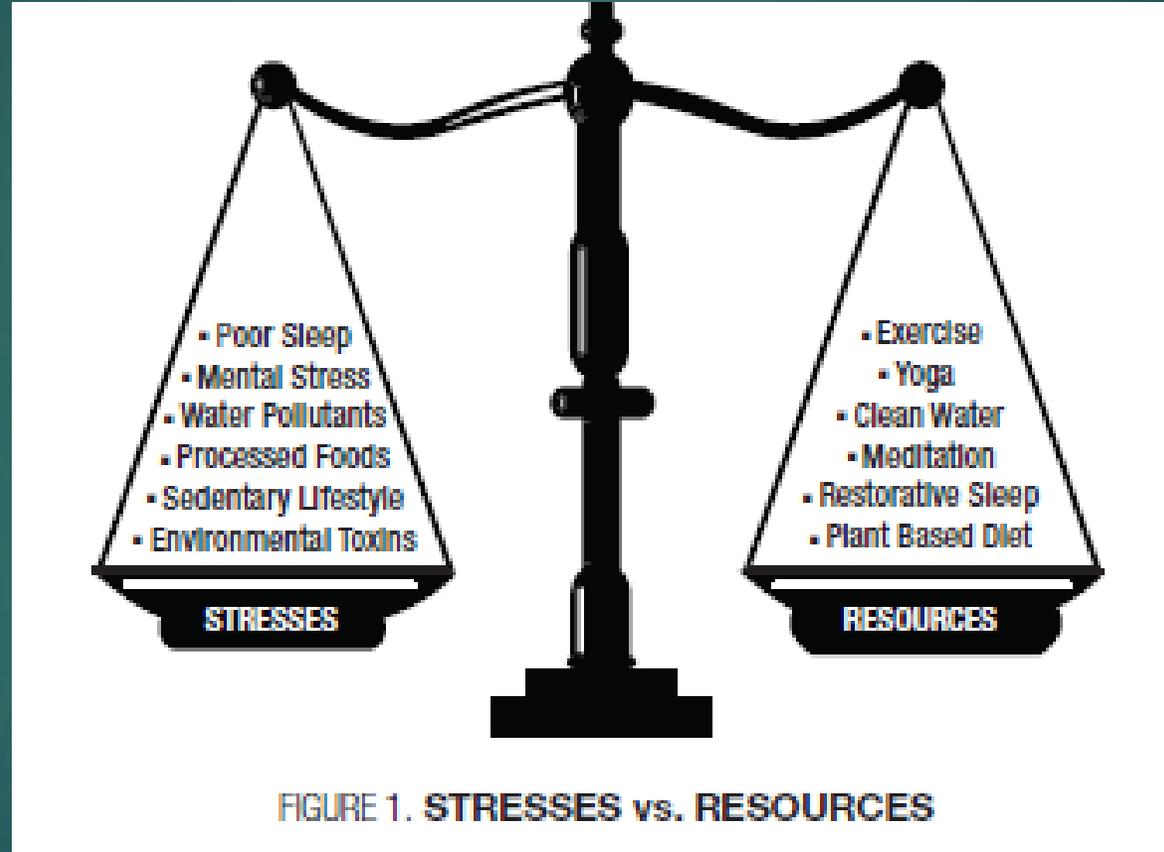


Physical inactivity, obesity, diabetes, and acquired cardiovascular disease (CVD) may be at least as prevalent in patients with congenital heart disease as in the general population.

Only 20% of congenital heart patients have a “heart healthy” lifestyle

The remaining have at least one cardiovascular risk factor for heart disease  
Focusing on a heart healthy lifestyle early on will pave the way

# Imbalance=inflammation=illness



# nutrition

- ▶ Among the top 17 risk factors, poor diet quality has been identified by the US Burden of Disease Collaborators as the leading cause of premature deaths and disability in the United States

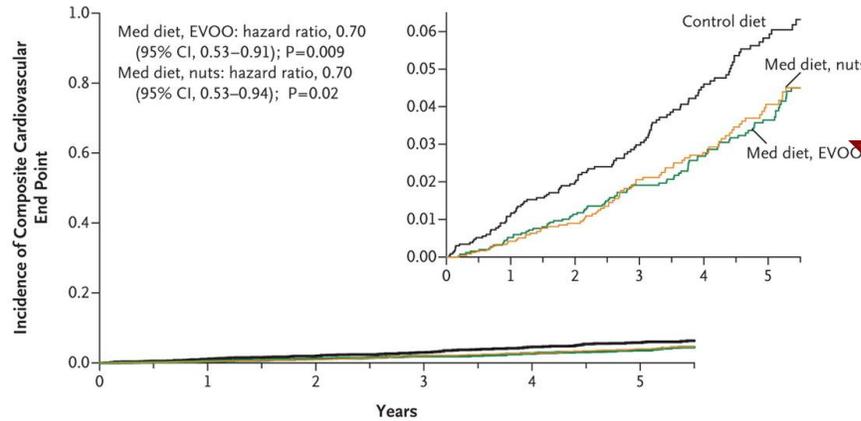
# Medical school education

- ▶ 57% of cardiologists received no nutrition training
- ▶ 33% of cardiologists received minimal nutrition training
- ▶ 59% cardiologists recall no nutrition talks in their internal medicine residency
- ▶ 57% cardiologists recall no nutrition talks in their cardiology fellowships
- ▶ No trend towards improvement as 56% of fellows in training state they receive no nutrition education
- ▶ 59% of cardiologists spend less than 3 minutes counseling patients on nutrition

# What is the best diet?

- ▶ Mediterranean versus Whole Grain Plant Based Diet

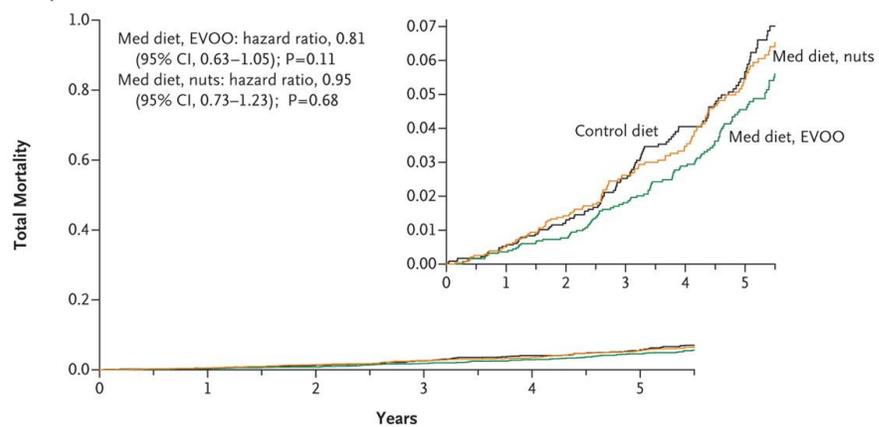
**A Primary End Point (acute myocardial infarction, stroke, or death from cardiovascular causes)**



**No. at Risk**

	0	1	2	3	4	5
Control diet	2450	2268	2020	1583	1268	946
Med diet, EVOO	2543	2486	2320	1987	1687	1310
Med diet, nuts	2454	2343	2093	1657	1389	1031

**B Total Mortality**



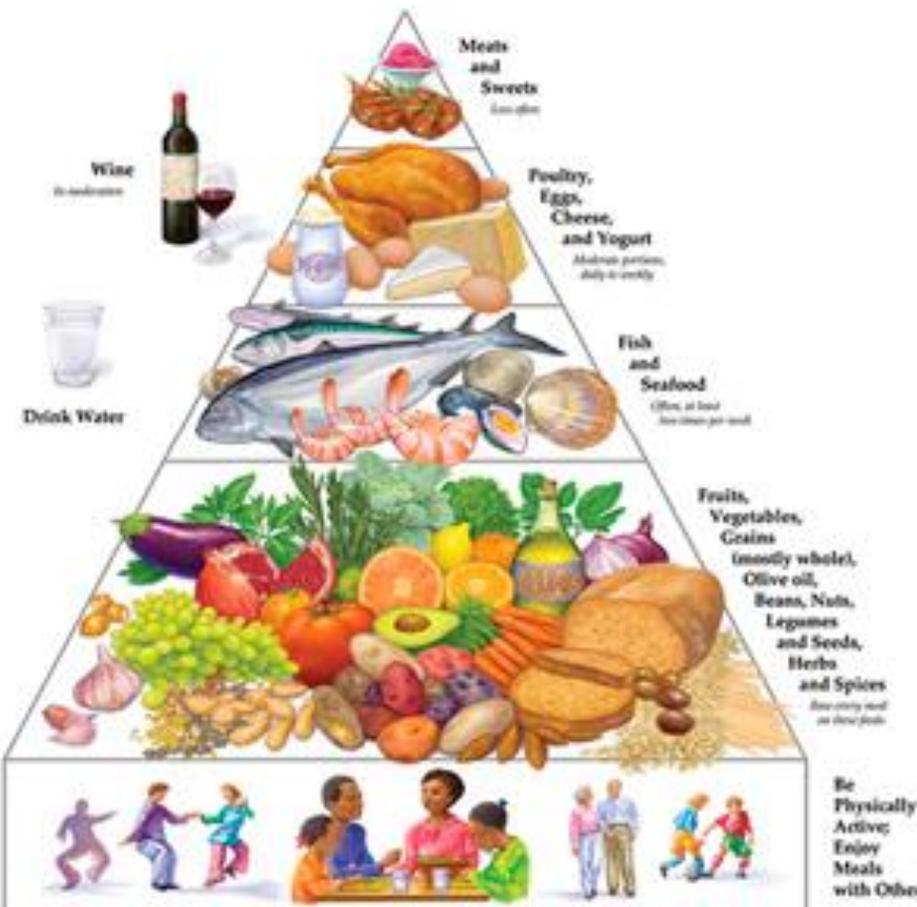
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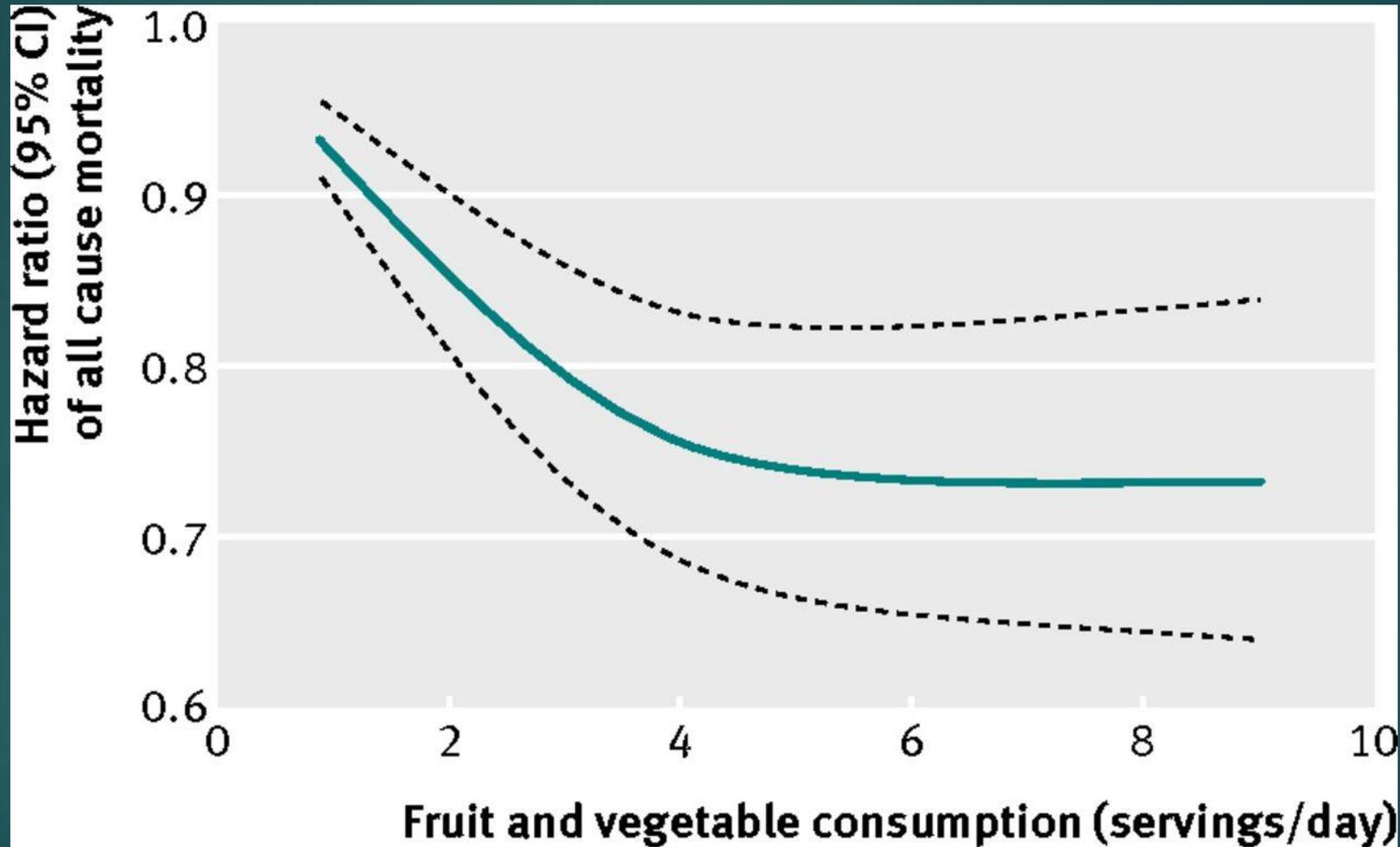


30%  
 End point driven  
 by reduction in  
 strokes

# Mediterranean Diet Pyramid

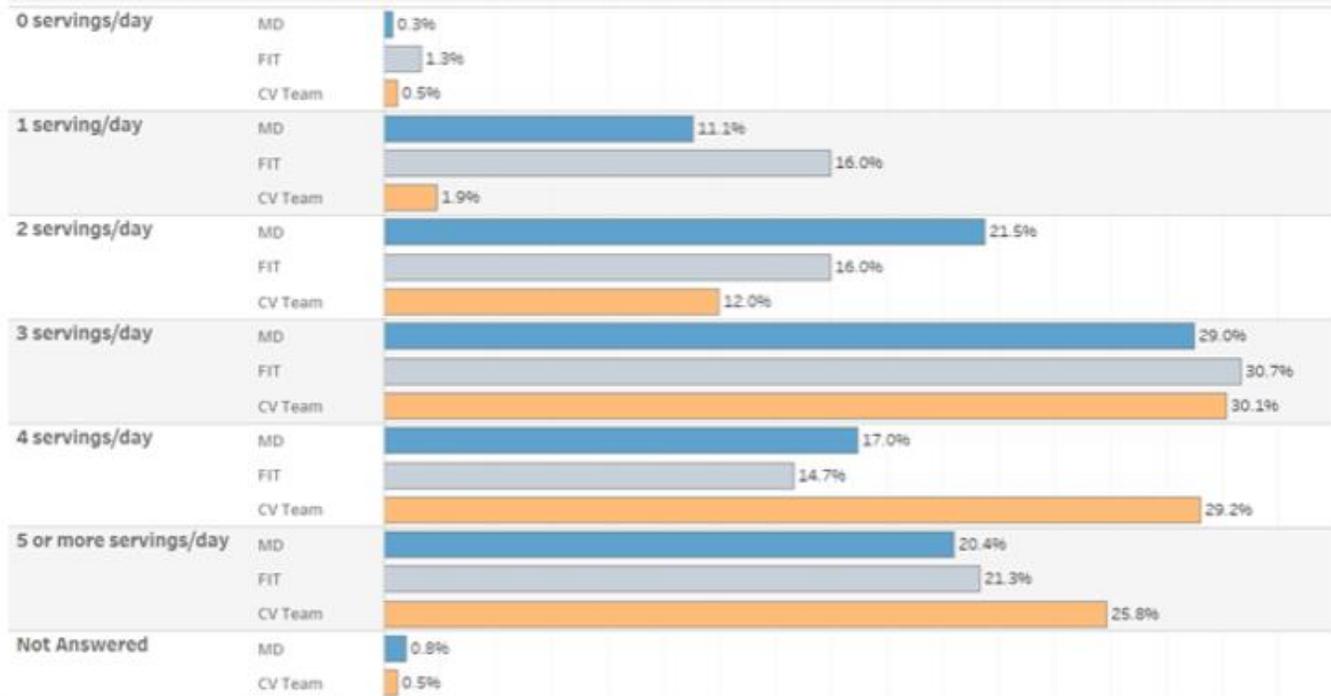


# Meta-analysis



# Dietary Habits of Cardiovascular Professionals

Average Servings of Fruits and Vegetables per day



# Fruits and vegetables

- ▶ The results of the present meta-analysis of cohort studies indicate that fruit and vegetable consumption is inversely associated with the occurrence of CHD. The risk of CHD is decreased by 4% for each additional portion per day of fruit and vegetables and by 7% for fruit consumption.

# What foods should we be advocating?

- ▶ Dark blue and red fruits like blueberries and strawberries?
- ▶ Full of ANTHOCYANINS and FLAVONOIDS which are anti-inflammatory and lower blood pressures
- ▶ 93, 600 women 25 to 42 years of age from the Nurses' Health Study
- ▶ An inverse association between higher intake of anthocyanins and risk of MI was observed (hazard ratio, 0.68)
- ▶ 34% reduction in myocardial infarctions in consuming >3 servings a week compared lowest quintiles

# Leafy green vegetables

- ▶ Each daily serving is associated with 23% reduction in cardiovascular disease
- ▶ Folic acid is likely the key ingredient
- ▶ Spinach and kale
- ▶ Folic acid supplements are NOT cardioprotective.
- ▶ Consult your physician, if you are on warfarin

# nuts

- ▶ 33% reduction in CV disease if eat all nuts combines, 4 times per week
- ▶ Despite the high calorie density, there was no associated increase in weight

# Whole Grains-nurses health study

- ▶ 75521 women aged 38–63 y with no previous history of cardiovascular disease or diabetes
- ▶ Observational
- ▶ The inverse relation between whole-grain intake and CHD risk was even stronger in the subgroup of never smokers
- ▶ Highest quintile of whole grain intake (>3 servings per day) was associated with a 25% reduction in cardiovascular disease

# Fish

- ▶ In the US Physicians Health Study, 22,071 US male physicians who were 40 to 84 years old and had no history of myocardial infarction or cerebrovascular disease.
- ▶ Survey
- ▶ Results showed that even one serving of fish per week was inversely related to the risk of sudden cardiac death.
- ▶ Importantly, there was no association between fish consumption and myocardial infarction.
- ▶

# More on fish...

- ▶ The GISSI-Prevenzione trial was a secondary prevention trial that looked at 11,324 patients who had had a recent ( $\leq 3$  months) myocardial infarction.
- ▶ At 3.5 years, the n-3 PUFA supplement at 1 g per day significantly reduced the primary endpoint (combined death, nonfatal MI, and stroke) compared with the control group.
- ▶ This benefit resulted largely from a 45% reduction in sudden cardiac death. This led to the belief that the benefit of omega-3 fatty acids is related to the decreased risk of sudden cardiac death; rather than related to reduction in MI.
- ▶ In studies, these improvements in lifespan were noted with marine omega-3 fatty acids and were most notable when intake was as high as 30 percent of the overall.

## **Very High Omega-3s, Low Mercury, Sustainable**

- Wild salmon
- Sardines
- Mussels
- Rainbow trout
- Atlantic mackerel

## **High Omega-3s, Low Mercury**

- Oysters
- Anchovies
- Pollock/Imitation crab
- Herring

## **Low Mercury But Also Low Omega-3s**

- Shrimp
- Catfish
- Tilapia
- Clams
- Scallops

## **Mercury Risks Add Up Pregnant Women And Children Should Limit Or Avoid**

- Canned light and albacore tuna
- Halibut
- Lobster
- Mahi mahi
- Sea bass

These fish contain too much mercury to be part of the regular diet of pregnant women and children.

## **Avoid Mercury Levels Too High To Eat Regularly**

- Shark\*
- Swordfish\*
- Tilefish\*
- King mackerel\*
- Marlin\*\*
- Bluefin and bigeye tuna steaks or sushi\*\*
- Orange roughy\*\*

# Sleep debt and inflammation

- ▶ Lack of sleep in the new millenium
- ▶ Cortisol highest in am and lower as the day goes on
- ▶ Recruits glucose
  
- ▶ Elevated sympathetic system or sympathetic overdrive associated with
- ▶ Chronic elevations associated with higher blood pressures and insomnia

- ▶ Spiegel K, Leproult R et al. Impact of sleep debt on metabolic and endocrine function. Lancet. 1999;354:1435-1439

# Hormonal changes with sleep debt

- ▶ Ghrelin – appetite stimulant
- ▶ Leptin- satiety

- ▶ Kowall, B. Associations among sleep disturbances , nocturnal sleep duration , daytime napping and incident prediabetes and type 2 diabetes. [Sleep Med.](#) 2016 May;21:35-41. doi: 10.1016/j.sleep.2015.12.017. Epub 2016 Jan 29.
- ▶ Taheri S, Lin L, et al. Short sleep duration is associated with reduced leptin, elevated ghrelin , and increased body mass index. [PLoS Med.](#) 2004 Dec;1(3):e62. Epub 2004 Dec 7.

# Changes in hormones related to hunger associated with sleep debt

- ▶ 1024 patients from a longitudinal sleep study
- ▶ Nocturnal polysomnography /sleep questionnaire /fasting glucose
- ▶ Leptin, ghrelin, adiponectin, insulin, glucose, and lipid
- ▶ <8 hours of sleep associated with elevated BMI
  - ▶ Independent of BMI <5 hours showed elevated ghrelin and low leptin

# Short and long sleepers were at increased risk for diabetes and prediabetes

- ▶ Subgroup of people aged 45-75
- ▶ Looked at baseline and 5 year follow up
- ▶ Self reported glucose score and self questionnaire for sleep
- ▶ Those <5 and >7.5 hours of sleep were at greater risk for diabetes
- ▶ Any regular sleep disorder was at higher risk of diabetes and prediabetes
- ▶ Regular nappers were not at risk

# Sleep Deprivation and Performance

- ▶ Meta-Analysis of over 19 original research studies
- ▶ 143 studies with N=1932
- ▶ Mood is affected more by sleep deprivation but so are cognitive and motor performance

# Moderate sleep deprivation = drunk driving

- ▶ Subjects given 17-19 hours of sleep deprivation performed equal to or worse than those with BAC 0.1%

- ▶ Williamson AM, Feyer A-M. Moderate sleep deprivation produces impairments in cognitive and motor performance equivalent to legally prescribed levels of alcohol intoxication. *Occup Environ Med.* 2000; 57: 649-655.

# Yoga/Meditation

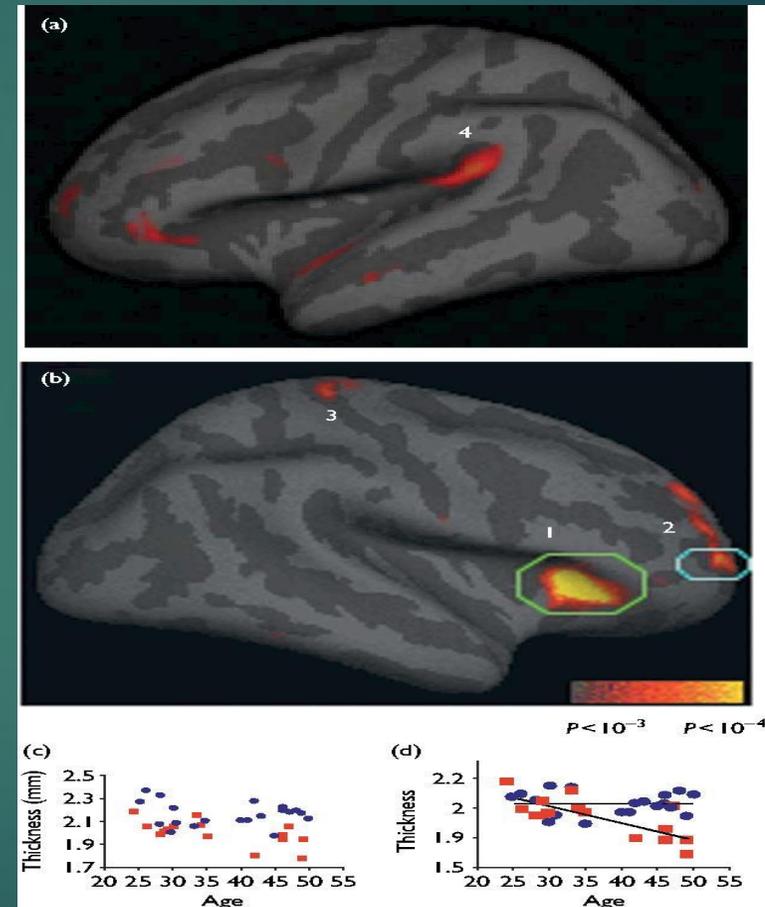
Mind /Body techniques have been shown to

- ▶ Reduce cortisol
- ▶ Reduce blood pressure
- ▶ Reduce risk for MI
  
- ▶ Improve mood
- ▶ Improving cognition
- ▶ Effects on genes
- ▶ Decreased pain

# Meditation and increased cortical thickness

- ▶ 20 participants who were active meditators compared with age related cohort of non meditators
- ▶ Brain regions associated with attention and sensory processing were thicker in meditation participants than matched controls, including the prefrontal cortex and right anterior insula.

Lazar SW, Kerr CE, et al. Meditation experiences is associated with increased cortical thickness. *Neuroreport*, 2006 Nov ;16 (17) :1893-1897.



# TM and Reduction in Cardiovascular Disease

- ▶ RCT of 201 Black men with CAD
- ▶ In 5.4 years 48% reduction in TM group for all cause mortality , MI and stroke
- ▶ 24% reduction in revascularizations and hospitalizations
- ▶ 4.9% reduction in systolic blood pressure

Schneider RH, Grim CE , etal. Stress reduction in the secondary prevention of cardiovascular disease: randomized controlled trial of Transcendental Meditation and health education in Blacks. *Circulation: Cardiovascular Quality and Outcomes*, 2012; 5: 750-758.

# Transcendental Meditation

- ▶ Practice which is taught by registered teachers
- ▶ Focus on a mantra (sound/word)
- ▶ 20 min twice a day
- ▶ 380 peer reviewed research and publications in over 160 journals
- ▶ Studies look at end points of stress, anxiety , depression, insomnia ,
- ▶ Lowering blood pressure, decrease cholesterol, and metabolic illness

# Exercise

- ▶ Congenital heart patients often self restrict from exercise
  - ▶ Not always indicated
  - ▶ Consult you physician, can often do more than you think
- ▶ Why is it important?
  - ▶ Cardiovascular health
  - ▶ Mood management
  - ▶ Memory enhancement
  - ▶ Reduce falls
  - ▶ Improve metabolism
  - ▶ Improve hormone imbalance
  - ▶ Reduced cancer risk

# Active couch potato

- ▶ Meta-analysis of 1 million patients
- ▶ High levels of moderate intensity physical activity (ie, about 60–75 min per day) seem to attenuates the increased risk of death associated with high sitting time.
- ▶ However, this high activity level reduces, but does not eliminate the increased risk associated with high TV-viewing time.

# Recommendations

- ▶ Recommendations from the American College of Sports Medicine for exercise and hypertension are dynamic aerobic endurance training for at least 30 minutes per day supplemented by dynamic resistance exercise.
- ▶ Isometric resistance training showed the highest reductions in SBP.
- ▶ The AHA recommends an average of 40 minutes of moderate-vigorous intensity aerobic exercise 3-4 times per week for lowering blood pressure and cholesterol.
- ▶ They also define exercise as any activity that burns calories such as walking, jogging, running, biking, playing sports, climbing stairs, weight training, and stretching.
- ▶ Consult your cardiologist before starting any exercise program

# Conclusions

- ▶ Decreasing risk of illness cannot focus on one thing
- ▶ imbalance=inflammation
- ▶ Goals:
  - ▶ Improve sleep
  - ▶ Electronic free time
  - ▶ Moments of calm, deep breathing, meditation
  - ▶ Exercise with dynamic exercises, isometrics
  - ▶ Nutrition>>more to come tomorrow on this topic