

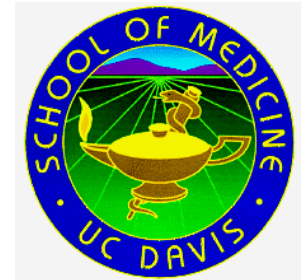
# Complementary and Alternative Therapies for HD



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# Complementary and Alternative Medicine (CAM) Definition

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*"CAM is a broad domain of healing resources that encompasses all health systems, modalities, and practices and their accompanying theories and beliefs, other than those intrinsic to the dominant health system of a particular society or culture in a given historical period."*

*Source: The NIH Office of Alternative Medicine, 1994.*

# What is the “Politically Dominant” Health Care System?

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Reflects broad acceptance as evidenced by “medical practice laws, legally recognized accreditation...., third party payment, privileged access to research moneys and to prestigious publication venues, high status, and so forth.”

*Source: Panel on definition and description, CAM research methodology conference, Alternative Therapy 1997;3:49-57.*

# Integrative Medicine

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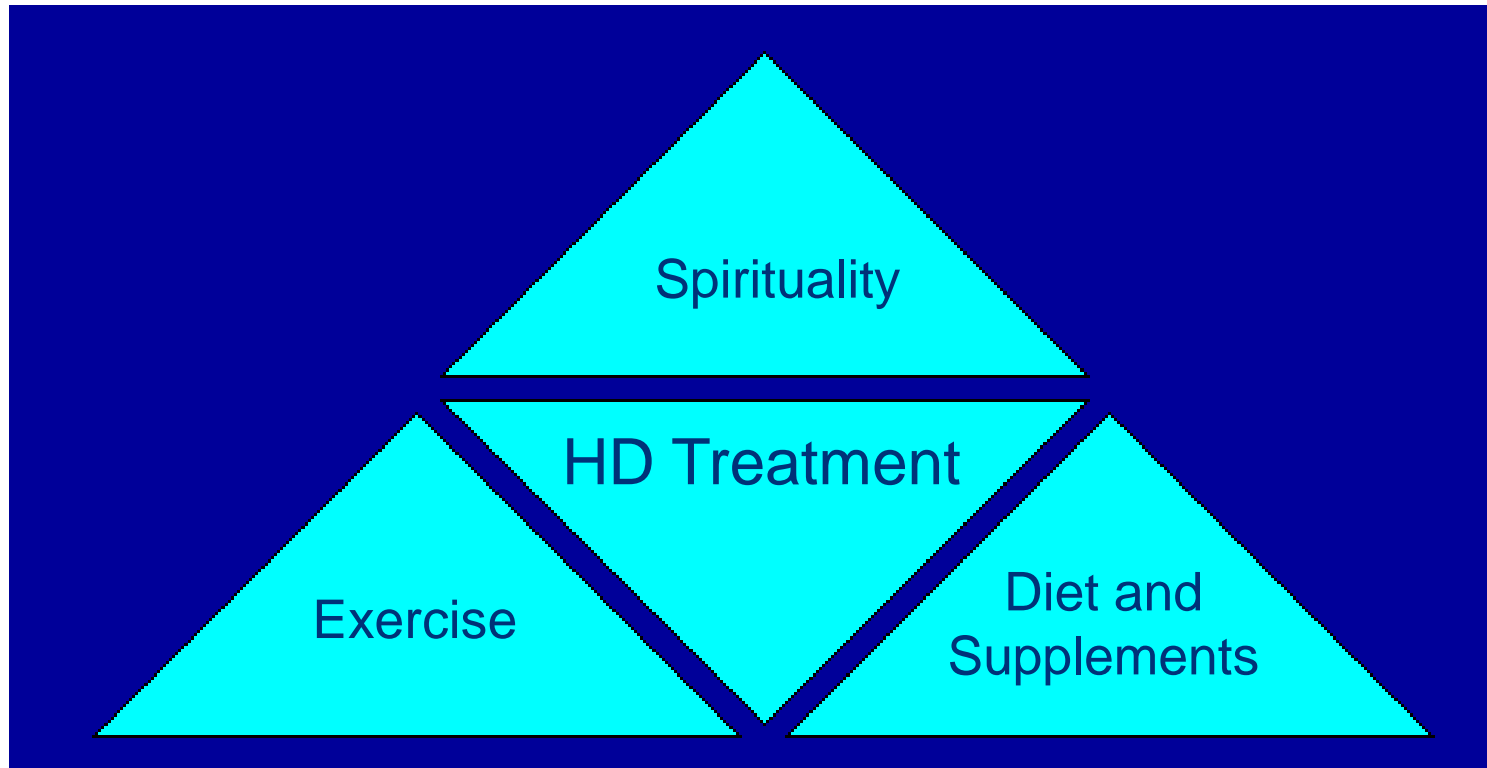
*Combined* conventional and CAM treatment approach

# Why Consider CAM for HD?

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- Despite the discovery of the gene responsible for HD in 1993, we don't yet have a cure
- Treatments for HD have lagged behind those of other neurological conditions; focus on the cure
- Influence of predictive testing: what can a person who tests positive do while they're still healthy?

# HD Treatment Triad\*



\*Adapted from Jerry Lampson, [www.hdlighthouse.org](http://www.hdlighthouse.org)

# Spirituality

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- Multiple paths.....organized religion, massage, relaxation, yoga, meditation
- No research has been published in this area, but PHAROS and PREDICT studies are collecting data via questionnaires from participants

# Exercise

- HD study mice had delayed onset of HD symptoms when placed in a stimulating environment
- One study of 6 individuals with HD showed behavioral improvement with remotivation therapy



*Van Dellen et al, Nature 2000;404:721-2*  
*Sullivan et al. J Neurosci Nursing*  
*2001;33:136-142*



# Exercise

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- Mechanism: explored by Spires et al in UK:  
(J Neuroscience 2004;24:2270-6)
- Using study mice, mice were randomized to be placed in regular vs. enriched environments. Control mice with HD gene were also used.
- Results: those in enriched environments had improved coordination and had normal levels of brain growth factors.

# Exercise....Does It Help in HD?

- Yes!
- Possibly neuroprotective
- Definitely helps symptoms of pain, decreased balance, walking difficulties
- Recommendation: exercise helps!



# Diet and HD

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Choose fruits and vegetables  
over unhealthy fatty foods



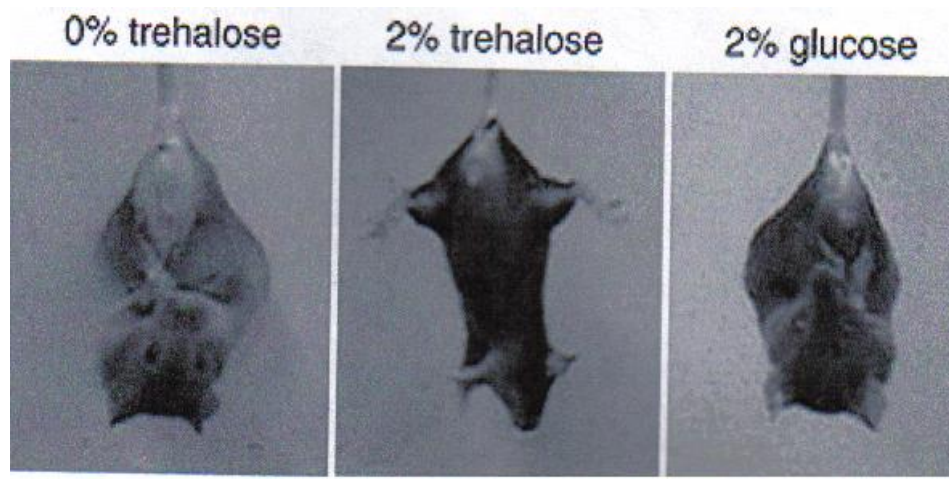
# The HD CAG Expansion Causes a Number of Metabolic Changes

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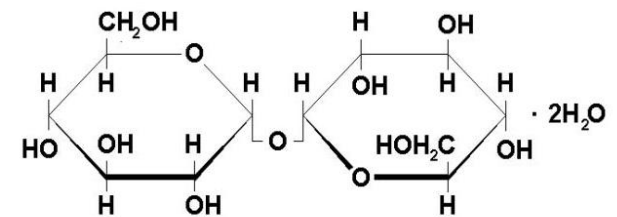
- People with HD have decreased body mass index (BMI) and over 3 years gain less weight than average Americans
- Increased 24 hr energy expenditure
- Cholesterol metabolism is abnormal in HD brain cells
- Altered glucose tolerance in people with HD

# Diet Supplements in HD

- Trehalose, a naturally-occurring sugar molecule found in shellfish, honey, and mushrooms, helped HD mice.



## Trehalose Structure



$\alpha, \alpha$  - Trehalose

trehalose

*Tanaka et al, Nat Med 2004;10:148-54*

# Diet Supplements

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Curcumin (spice turmeric) reduced protein clumping in HD cells in culture



1. Dikshit et al, *BBRC* 2006.
2. Kumar et al, *Methods & Findings in Exp&Clin.Pharm.* 2007



## More Diet Clues

- Fruits rich in polyphenols (blueberries, cranberries, strawberries, concord grape juice) can reduce oxidative stress and brain inflammation and can improve memory and motor behavior
- Another polyphenol, green tea, may also help cells degrade abnormal protein

*Joseph et al, Ann NY Acad Sci 2007;1100:470-485*

*Kalfon et al, L Neurochem 2007;100:92-1002*

# A Role for Chocolate in HD?

- Cocoa contains a high concentration of flavenoids. These compounds reduce oxidative damage in animal and cell models.



*Source: Orozco et al, J Nutri Biochem 2003;14:104-110.*





# More Diet Clues

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- Fruits rich in polyphenols (blueberries, cranberries, strawberries, concord grape juice) can reduce oxidative stress and brain inflammation and can improve memory and motor behavior

# Diet in HD: What Can We Recommend?

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- Eat a diet rich in polyphenol flavinoids (BB, other fruits, green tea, cocoa)
- Match caloric intake to energy requirements
- Consider using trehalose or honey in place of sugar
- Role for Turmeric.....needs more research
- Cholesterol.....needs more research

# Supplements in HD

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- Coenzyme Q10
- Creatine
- Omega 3 Fatty Acids

# Coenzyme Q10

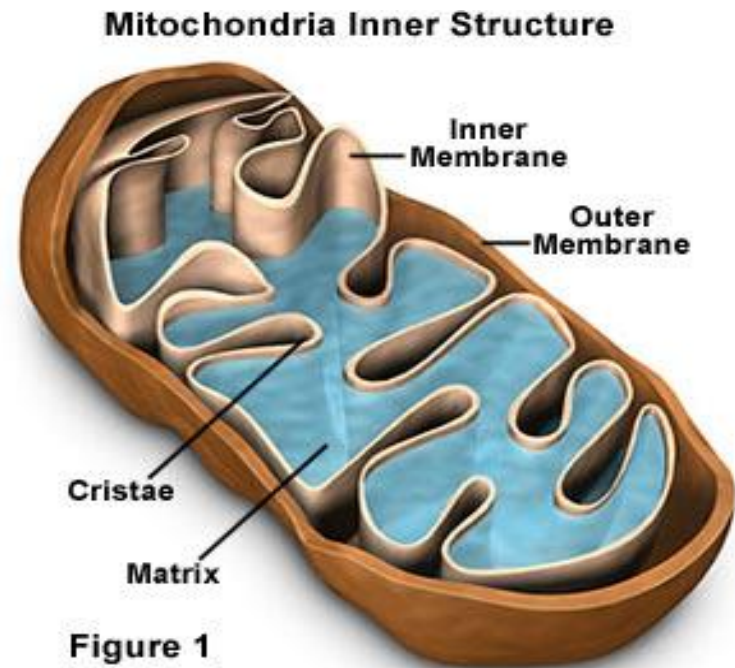
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- Mechanism: Improves energy metabolism in mitochondria
- Source: occurs in meats and seafood
- Research: benefit seen in HD mouse model, in brain energy metabolism in people with HD, and showed non-significant trend\* of helping slow HD progression in HSG CARE-HD study.

*\*Not statistically significant. HSG, Neurology 2001;57;397-404*

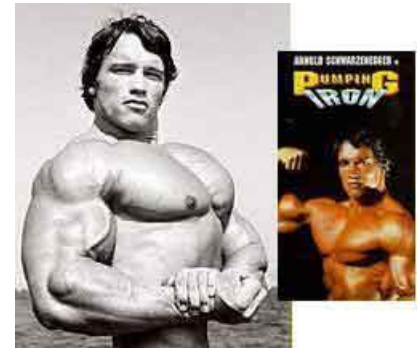
# Coenzyme Q10

- Dosage: 1200-2400 mg/day
- Safety: established
- Down-side: cost (approx. \$200/month)



# Creatine

- Mechanism: improves energy metabolism in body and brain
- Source: protein-derived
- Research: improved brain metabolism and decreased blood levels of 8OH-DG; safe and tolerable in people with HD



# Creatine

- Dose: 5-10 gm/day (possibly more)
- Safety: established at those doses
- Cost: relatively low
- Caution: kidney disease, diabetes

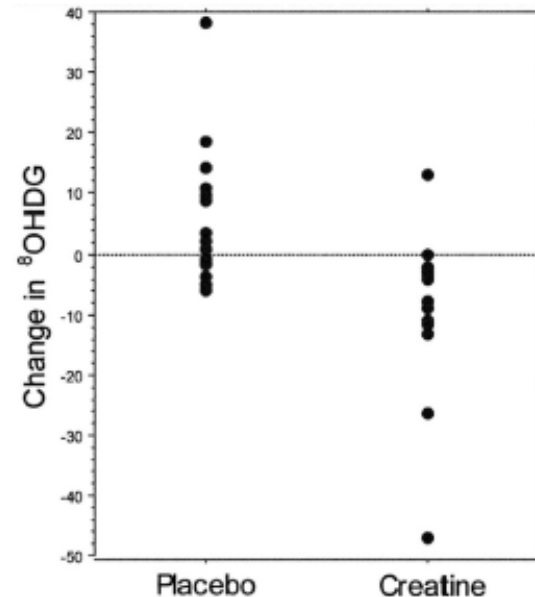


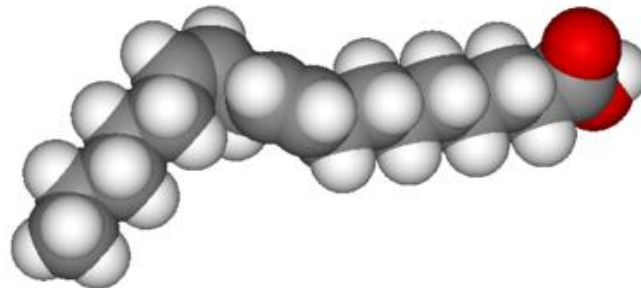
Figure. Changes in serum 8-hydroxy-2'-deoxyguanosine (8OH2'dG) levels in placebo and creatine treated subjects. Scatterplots showing individual changes in 8OH2'dG levels (pg/mL) at week 16 in the 32 subjects from two sites. The difference in the changes between treatment and placebo groups was significant ( $p < 0.0042$ ).

Hersch et al, *Neurology* 2006;66:250-2

# Omega 3 Fatty Acids

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- Mechanism: improves energy metabolism
- Source: seafood, plants (must be obtained from diet)
- Research: Modest help in large European trial; TREND-HD study showed no improvement in chorea, but many study participants felt a benefit





# Omega 3 Fatty Acids

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- Dose: 2 or more grams/day
- Safety: established, but beware of mercury contamination
- Cost: Low
- Caution: blood thinners, avoid falls

