Bonus Material for Night #4
"Fasting as a Natural Remedy"

David DeRose, MD, MPH
CompassHealth Consulting, Inc.
drderose@compasshealth.net

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Disease States Potentially Benefited By Various Types Of Fasting

- Diabetes, type 2
- Hypertension
- Impending acute infectious illness
- Auto-immune diseases
  - Rheumatoid arthritis
  - Lupus
- Other inflammatory conditions
  - Asthma
  - Inflammatory Bowel Disease
- Certain eating disorders
  - e.g., late night binges

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Types of Fasts

- Eating less on a regular basis—by whatever means (e.g., see items with * below)
- Excluding specific foods
- Skipping suppers*
- No eating between meals*
- Very low calorie diets
- Juice fasts
- Total fasts (no caloric intake)
- The leaf-stalk-flower fast

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Caloric Restriction

- Food restriction increases the mean and maximal life spans of rats, mice, and other species.
- In murine models a decrease to roughly 50% of standard caloric intake results in:
  - A lifespan nearly twice as long
  - Significantly fewer tumors
- In other animal models decreasing food intake in the range of 25-40% has been shown to improve immune function against cancer at the same time that allergic responses are decreased.

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Did You Know?

Scientists have discovered a secret weapon against some of the most devastating neurological diseases

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Did You Know?

- This agent also tends to improve the mental processing of normal, healthy people
- It is called Brain-derived Neurotrophic Factor (BDNF)

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BDNF: Benefits

- BDNF has been shown to improve cognitive function
- It may aid in preventing/treating alcohol abuse
- It has appetite suppressant effects

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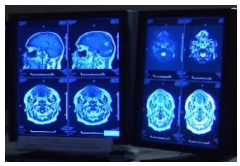
BDNF: Benefits

It also has documented preventive effects on conditions as diverse as…

- Alzheimer's disease
- Parkinson's disease
- Ischemic Stroke
- Depression



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How to Naturally Optimize BDNF

- Dietary Restriction
- Regular Physical Exercise
- Environmental Enrichment/Stimulation
- Alcohol Avoidance

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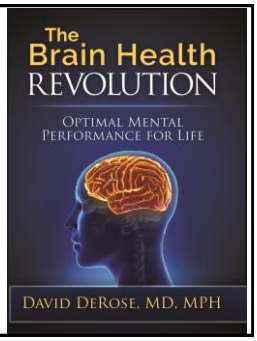
Complementary Resource

- BDNF is discussed in some detail in our 2-hour mini-series
- Also covers problems with low carbohydrate diets
- Presents a variety of other topics



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How to Naturally Optimize BDNF

- **Dietary Restriction**
- Regular Physical Exercise
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Dietary Restriction

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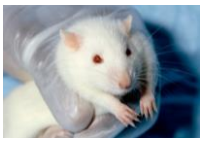
Dietary Restriction

In animal models both decreased caloric intake and periodic fasting consistently contribute to higher levels of BDNF.



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Dietary Restriction

- The theory is that caloric deficits stress the brain, and in response, levels of this protective agent are increased.
- In one primate model, cutting back calories as little as 30% significantly boosted BDNF levels.

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More Good News About Eating Less

- In animal models, dietary restriction is one of the most consistent longevity stimulating factors known
- It should therefore come as no surprise that dietary restriction improves hemorheology, decreasing inflammation, and improving a host of conditions.

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Caloric Restriction and Inflammation

When compared to rats allowed to eat all they chose, those subjected to caloric restriction for nine weeks, had lower total body levels of inflammation as documented by lower levels of:

- Tumor Necrosis Factor-α (TNF-α)
- Interleukin-4 (IL-4)
- Interleukin-6 (IL-6)

Ugochukwu NH, et al. 2006 Nutrition Research; 26(5): 221-6.

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Caloric Restriction and Alzheimer's

"it is now widely accepted that if the onset of the disease [Alzheimer's disease (AD)] could be delayed by even 5 years, the incidence could be cut in half."

Neuroinflammation Research Laboratories, Department of Psychiatry, Mount Sinai School of Medicine, New York, N.Y
Interdiscip Top Gerontol. 2007;35:159-75.

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Caloric Restriction and Alzheimer's

"Both clinical and epidemiological evidence suggests that modification of lifestyle factors such as nutrition may prove crucial to AD management given the mounting experimental evidence suggesting that brain cells are remarkably responsive to 'what somebody is doing'."

Interdiscip Top Gerontol. 2007;35:159-75

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Caloric Restriction and Alzheimer's

- "Recent studies strongly support the evidence that caloric intake may play a role in the relative risk for AD clinical dementia."
- "we found that high caloric intake based on saturated fat promotes AD type beta-amyloidosis"

Neuroinflammation Research Laboratories, Department of Psychiatry, Mount Sinai School of Medicine, New York, N.Y
Interdiscip Top Gerontol. 2007;35:159-75.

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Caloric Restriction and Alzheimer's

"dietary restriction based on reduced carbohydrate intake is able to prevent it."

Neuroinflammation Research Laboratories, Department of Psychiatry, Mount Sinai School of Medicine, New York, N.Y
Interdiscip Top Gerontol. 2007;35:159-75.

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A Possible Mechanism?

"obesity and diabetes are associated with a >4-fold increased risk of developing AD."

Neuroinflammation Research Laboratories, Department of Psychiatry, Mount Sinai School of Medicine, New York, N.Y
Interdiscip Top Gerontol. 2007;35:159-75.

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Temperance Illustrated

Perhaps the most powerful <u>Weight Control Weapon</u>:

- Eating to satisfy hunger;
- NOT eating to TRY to satisfy appetite.

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Hunger vs. Appetite

How to Know the Difference:

- Slow your eating
- "If a question, then quit."
- For the less brave:
  "the substitution test."

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What About Periodic Fasting?

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Which Meal Not to Skip?

- Eating breakfast increases the likelihood of longevity.
- In some of the original Alameda County data, men who ate breakfast and did not eat between meals had less than half the risk of death of men who skipped breakfast and snacked.

Kaplan GA, Seeman TE, et al. *Am J Public Health* 1987 Mar;77(3):307-312; Belloc NB. *Prev Med* 1973 Mar;2(1):67-81.

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Avoiding Frequent Meals and Snacks

- A more recent analysis of Alameda County study data focused particularly on 60- to 94-year-old individuals.
- Those who didn't eat breakfast regularly had a 50 percent increased risk of death compared to the regular breakfast eaters.

Kaplan GA, Seeman TE, et al. *Am J Public Health* 1987 Mar;77(3):307-312; Belloc NB. *Prev Med* 1973 Mar;2(1):67-81.

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Avoiding Frequent Meals and Snacks

Remarkably, in this age group, long life was as dependent on eating a good breakfast as it was on not smoking or getting regular physical exercise.

Kaplan GA, Seeman TE, et al. *Am J Public Health* 1987 Mar;77(3):307-312; Belloc NB. *Prev Med* 1973 Mar;2(1):67-81.

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How to Naturally Optimize BDNF

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- **Alcohol Avoidance**

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Avoid Alcohol

Key Message:

Alcohol impacts BDNF and other neurotrophin levels—and some of that impact appears undesirable.

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Alcohol May Disrupt Neurotrophin Levels

In animal models, chronic alcohol exposure appears to upset the balance of key trophic factors in the brain

Miller MW, et al. J Neurobiol. 2004 Sep 15;60(4):490-8.
Logrip ML, et al. J Neurochem. 2009 Jun;109(5):1459-68.

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Among Alcohol's Detrimental Effects…

In an animal model, chronic alcohol exposure upset the balance of key trophic factors in the brain including:

- generally depressing nerve growth factor (NGF)
- Decreasing brain-derived neurotrophic factor (BDNF) concentration in the hippocampus.

Miller MW, Mooney SM. J Neurobiol. 2004 Sep 15;60(4):490-8.

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Benefits of Fasting Beyond BDNF

Available free at:
www.CompassHealth.net

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Fasting and Immunity

- Short-term fasting enhances immunity
- Long-term fasting depresses immunity

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Rhythms of Life

- Fasting—analogy with the Sabbath
- Time to rest the digestive organs
- Walking after a meal
- Stress Management

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Fasting from Harmful Foods

Total Abstinence of that which is harmful—part of the true concept of ***Temperance***

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Fasting from Harmful Foods

Examples of Excluded Foods

- Chocolate, Chips, Desert Categories (ice cream, etc.—beware of replacements)
- Sugar
  - Often not constructive useful to totally avoid sugar forever
  - Rule of thumb for Cereals: at least 5x complex CHO per simple CHO
  - High sugar foods
  - Juices: pros and cons

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A Food Category You Should Not Exclude

Carbohydrates

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Problems with Ketogenic Diets

- Mental Health Effects
  - Low carbohydrate intake predisposes to lower serotonin levels which may precipitate depression
  - Other mental effects, including anger?
- Tend to be high in saturated fat, which raises insulin resistance

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Anger and High Protein Breakfasts?

- As part of a broader dietary intervention,10 college students ate a high protein breakfast for three weeks.
- They were compared to a control group of 9 students
- The group that ate the high protein diet had a higher anger score in the morning

Deijen JB, Heemstra ML, Orlebeke JF. Dietary effects on mood and performance. J Psychiatr Res 1989;23(3-4):275-83.

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Benefits of an Evening Fast (Skipping Supper)

- Eating fewer times per day (e.g., twice instead of seven times) has been associated with a trend toward Improved glycogen synthesis.
- This suggests that more glucose is being diverted to these beneficial processes.

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Benefits of an Evening Fast (Skipping Supper)--continued

- Large suppers may be deleterious to morning glucose control.
- Other research suggests that if an evening meal is eaten, it should constitute less than 30% of total daily calories.
- Caloric intake later in the day is associated with weight gain. This is a serious concern since most individuals with type 2 diabetes are overweight.

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Benefits of an Evening Fast (Skipping Supper)--concluded

- Fasting for five hours or more may be especially good for your intestinal tract
- The migrating motor complex is only fully expressed following five to six hours of fasting, *provided you are not sleeping*

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Fasting and Time in Your Schedule

- The challenge of passive virtues
- Cutting short our sleep
- What happens if you spent less time eating and preparing meals?

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Lessons from the Alameda County Health Study

Longevity and freedom from disability were associated with two meal patterns

- Avoiding snacking
- Eating breakfast regularly

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Physiology of Total Fasts

- Sympathetic nervous system tone drops
- Sodium output increases due to metabolic changes and water-induced diuresis
- Fasting and insulin resistance
  - Insulin resistance rapidly drops during a fast
  - Insulin resistance is associated a host of conditions
    - High blood pressure
    - Type 2 diabetes
    - Abnormal cholesterol profile
    - Female infertility
    - Certain types of cancer

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Implementing a Total Fast

- Necessary medication adjustments
- Length of the fast
- Rationale for typical prohibition of sodium intake
- Breaking the fast

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Metabolic Stages During Fasting

- For up to 15 minutes: energy demands can be met by glucose in the blood stream
- First 8 hours: glycogen stores in muscle and liver are converted to glucose in the face of falling serum insulin levels and rising glucagon levels
- Glycogen stores are depleted in less that a day; within 20 hours the body uses protein and fat for energy

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Special Fasting Considerations in Diabetes and High Blood Pressure

- Need to consider medication therapy
- Downward adjustments (or discontinuation) are often necessary for blood pressure medications and diabetes medications (if they have the potential to lower a normal blood sugar)
- In diabetes, fasting is typically only recommended if medically supervised or guided

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Fasting-Types Recommended

- A lifetime commitment to "fasting" (moderate eating)
- Reinforcement of the benefits of skipping supper and/or not snacking
- Fasting one day per week—who is it right for?
- Making clean breaks with problem foods

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