

Brain Nutrition

Review of short course #1 presented by David LeMay, MD
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"The brain is a biochemical organ," stated LeMay in his introduction to this course covering concepts in brain nutrition. He continued, "Nutrients are involved in all body processes at the cellular level."

He then proceeded to give the class a lesson in related biological processes between the brain, body, and nutrition in the categories of micronutrients (vitamins, minerals, and phytochemicals in our food) and macronutrients including proteins, fats, carbohydrates, and water

Dr. LeMay captured our attention with some staggering statistics...

- 78% of Americans do not meet basic activity level recommendations
- There has been a 75% increase of type II diabetes in adults age 30-40 since 1990
- 80% of type II diabetes is related to obesity
- 70% of cardiovascular disease is related to obesity
- 42% of breast and colon cancer is diagnosed among obese individuals
- Obesity puts individuals at higher risk for illness than smoking
- 33% of Americans are obese with a BMI of 30 or greater

What does this mean? Nutrition is a big deal! We should turn our focus to disease PREVENTION with optimal nutrition since many ailments result from a poor diet. Perhaps we can avoid reacting to it with surgery, pills, etc.

LeMay also covered the topic of neurodegenerative diseases, which have nutritional links rooted in inflammatory processes, reactive oxidation, and inhibition of energy production. The risk factors include genetic predisposition, head traumas, TIA's, microvascular defects, diabetes, and infectious agents. LeMay then gave us a thorough biochemistry lesson on energy metabolism affecting neuron health

as determined by calorie restriction, lipid intake, serum glucose levels, gene expression, and neurodegeneration linked to inflammation.

He covered risk factors of Alzheimer's Disease specifically, which include:

- Age
- Obesity
- HSV-1
- Low vitamin D
- Dietary fat intake/type
- Head trauma
- Elevated homocysteine
- APOE-4 gene
- Diabetes

LeMay then turned his attention back to nutrition as he outlined the functions of macronutrients in the diet. The body requires **protein** in the production of muscle, manufacture of hormones, DNA, antibodies, enzymes, skin, organs, **neurotransmitters**, and the maintenance of acid-alkali balance. Amino acids are the building blocks of neurotransmitters, the loss of which contributes to widespread breakdown in the brain. **Carbohydrate** metabolism affects blood glucose regulation and hormones. Even the type of **fat** we eat influences insulin levels and hormones. The best fatty acids for brain function are DHA and EPA. Fiber, taken in foods with carbohydrates, affects blood glucose metabolism.

"Why should we care about this?" asks Dr. LeMay, *"Our brain health is at risk! There is a large brain body connection and prevention with nutrition is key."*

Intervention is not so effective after onset of disease. He delivered particularly bad news for the brain of a diabetic on insulin, a situation which can lead to oxidative stress, atrophy, and inflammation. He also described how midlife adiposity increases the risk of Parkinson's Disease and that hormones

affect neurotransmitters and our ability to sleep well.

Putting it all together, the class was offered a list of what helps decrease inflammation, which is key in all the aforementioned disease processes:

- DHA
- Resveratrol
- Curcumin
- Pharmaceutical COX-2 inhibitors
- Green tea
- Decreasing calories
- Lower saturated fat
- Lower glycemic index (lower carbohydrates)

How we can protect our brains by:

- Caloric restriction
- Physical exercise
- DHA
- Mental exercise

These preventative measures result in neurogenesis, neuroplasticity, and neuronal repair.

In a nutshell, he suggests following a Mediterranean diet, increasing consumption of fruits and vegetables, eating breakfast to include a good protein source and fewer carbohydrates, and eating clean. Clean eating involves practices such as consuming whole food in its most natural form with little or no processing and including lots of fruits, vegetables, whole grains, and lean meats in our diet on a daily basis.

Suggested reading:

- Blaylock, R. (1997) Exotoxins: The taste that kills. Health Press, New York.
- Braverman, E. (2004) The Edge Effect. Sterling Publishing, New York.
- Perlmutter, D. (2004) The Better Brain Book. Penguin, Berkeley.
- Schmidt, M. (2007) Brain Building Nutrition: How dietary fats and oils affect mental, physical, and emotional performance. (3rd Edition), Frog Books, Berkeley.