Developing a Healthy Body and Brain During Recovery

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The Effects of Diet & Lifestyle on Brain Function & Potential for Addictions

Dopamine
GABA
Acetylcholine
Serotonin

Chronically Poor Diet
Poor Digestion and Leaky Gut
Chronic 24/7 Stress

Chronically Poor Diet

Goals and Expectations for Today

Game Plan
• Learn about how neurotransmitters out of balance can lead to a tendency for addictions
• Learn about what dietary and lifestyle issues can cause these neurotransmitters to be out of balance
• Learn strategies to apply as an adjunct to counseling for total body and mind health.

Addictions Treatment Triad

Mental Health
Chemical
Functional

We Are Not Experts on:
1. Counseling
2. Neurochemistry
3. Drugs

What We’re Pretty Good At:
Functional/Lifestyle Medicine

Addictions (AKA The Holistic Health Matrix)

Chiropractic—spinal adjustments
Us Guys
“Fix My Back Doc”

Why’s a Bone Doctor Talking About Functional Medicine?

Northwoods Chiropractic

Food for Thought

Jay Lombard, DO, Cornell University
Eric Braverman, MD

Functional Medicine Matrix

(aka the Holistic Health Matrix)
We’ve Made Some Discoveries Over 23 Years of Practice

Discovery #1
Chiropractic is great for acute pain and prevention of wear and tear in the joints of the body. But..... Chiropractic does not get to the root of most chronic pain.

Discovery #2
Chronic, generalized pain throughout your body is an indication that something isn’t functioning right in your body. It’s not just a bone out of place.
- If your body does not work the way it should, you will have health problems that not only can lead to chronic pain, but a whole host of other chronic health problems
- Usually people who have chronic generalized pain have other chronic health problems as well.

Discovery #3- The Best Answer for Chronic Pain & Chronic Health Problems (including a healthy brain)
GET HEALTHY!
- Optimal Structure-Chiropractic
- Optimal Function-Functional/Lifestyle Medicine® (Holistic Health)
- Correct thinking/Counseling-You Guys

What is Chronic, Generalized Pain?
- The pain is everywhere
- The pain is always there at varying degrees
- Spinal Adjustments give some temporary relief but …...
  a. You have to keep going to get any relief at all
  b. The pain is still never gone

What Do We Mean By Chronic Health Problems
- Diabetes
- High Blood Pressure and Cholesterol
- Increased Weight
- Hormonal Problems, Digestive Problems
- Immune Problems (allergies, chronic illness)
- Fibromyalgia, Chronic Fatigue Syndrome
- Neurotransmitter problems (sleep issues, depression, anxiety, brain fog, tendency for addictions, etc.)

Good Health, Better Brain Function, Better Prognosis
- We want to make a case today that the healthier a persons' body is, chances are they will have healthier brain function AND their chances of recovery in their addictions program will be much better.
- The more unhealthy the individual, possibly the harder it will be during their recovery program
Winging Nutrition vs The Functional Medicine Approach

• For years we had practiced causal nutrition (that is a “shooting from the hip”) style of prescribing vitamins, minerals and diets
• But after years of being frustrated with these type of chronic cases we came upon this discipline of Functional Medicine
• We went to a seminar on Functional Medicine, nutrition and Fibromyalgia (to get our credits) and what we found was the practice of nutrition and lifestyle medicine is NOT CAUSAL. As a matter of fact we learned just how serious it is to find out the biochemical individuality of a patient before you prescribe any nutrition.
• And when you do this, and prescribe the specific, proper nutrition, diet and lifestyle for that body, WONDERFUL, HEALTHY, HEALING things can result.

What is Functional Medicine?
The in depth study of the function of the body through laboratory analysis.

The Correlation Between Functional Health & Addictions

The Functional Medicine Matrix (AKA The Holistic Health Matrix)

Discovery #5- It Helps to Know How a Patient is Wired When We Work on Getting Them Healthy

• How our brain functions will help us determine how we view our health, our life, our stresses, our highs and lows, our goals, etc.
• Our physical health is very much dependent on our mental health. If you know how a person’s tendencies are you can utilize them in our counseling (or in our case, Functional Medicine Treatment)

Goals and Expectations for Today

Game Plan

• Learn about the 4 primary ways we can be neuro chemically hard wired (neurotransmitters) which will effect our tendency for behavior
• Learn about how neurotransmitters out of balance can lead to a tendency for addictions
• Learn about what dietary and lifestyle issues can cause these neurotransmitters to be out of balance
• Learn strategies to apply as an adjunct to counseling for total body and mind health.
Neurochemistry in a Nutshell

1. The brain is made up of 100 billion of neurons which communicate to one another via chemicals called neurotransmitters.

2. A healthy brain communicates from neuron to neuron via neurotransmitter to neurotransmitter receptor. Various health circumstances cause to communication to be faulty. The proper amount of neurotransmitter and healthy neurotransmitter receptors are needed for this communication to work well.

Neurotransmitters

- Scientists have identified over a hundred different neurotransmitters.
- Each one communicates different personalities and characteristics.
- We all have a mix of these neurotransmitters but are usually dominant in 1 of the 4 main neurotransmitters:
  - Dopamine, Acetylcholine, GABA, Serotonin

Dopamine - Power

The Dopamine Dominant Person
- Fast on your feet and self confident
- Highly rational - more concerned about facts and figures than with feelings and emotions
- Able to assess yourself critically but do not accept criticism from others
- Task oriented and take pride in achievement
- You're thinking, inventing, problem solving
- You're hyper, competitive and require less sleep

You are more skilled at establishing relationships rather than nurturing them
You assume that reason is more important than feelings
You tend to control relationships and situations especially in pursuing personal growth

Dopamine - out of balance

- Excess - overly intense and driven, impulsive, possibly violent, over active libido and out of control sex drive, high risk for burn out (and depression)
- Also restlessness (kids ADD, ADHD), impatient, unable to relax

Stimulants can cause this, in the worse cases amphetamines and cocaine

Deficiency - very perceptive to the least amount of deficiency and they don't like it. Symptoms may include mild depression, insomnia, mild cognitive deficient or memory problems, fatigue

This can lead to a tendency to be drawn to substances which are stimulants such as sugar, nicotine and in some other cases more aggressive drugs (ie. Cocaine). Also risk taking behavior may take place to stimulate dopamine

Dopamine Deficiency (con't)

- Personality Issues - aggression, anger, depression, guilt or feelings of worthlessness or hopelessness, inability to handle stress, isolation, mood swings, self destructive thoughts.

The Stress of High Dopamine or Low Dopamine can lead to a tendency to take various drugs

Natural Strategies to Balance Dopamine

- Diet and Lifestyle Strategies:
  1. Balance your stress and intensity with relaxation (take nap, deep breathing, relaxation tapes, etc.)
  2. Work out in gym at least 2-3 days a week with weights (do aerobic also but make sure you do the weights)
  3. Make sure you eat a relaxed meal that calming and social
  4. Eat high quality protein with good fruits and veggies (organic)
  5. Eat a low (poor quality) carbohydrate diet. Stay away from processed sugar, breads, pastas.

- Supplementation:
  1. Amino Acid tyrosine (up to 6 grams a day) is important in building Dopamine. Phenylalanine processes the tyrosine.
  2. A good supply of B vitamins are needed (especially Folic Acid)
  3. High quality omega 3 fish oils are also a plus
**Acetylcholine- Creative**

*The Acetylcholine Dominant Person*

- Highly creative, open to new ideas and a quick thinker
- Constantly take others in to consideration
- Flexible, creative and open especially if it leads to learning, excitement or something new
- Enjoy things involving works, ideas and communication
- Sociable and charismatic and enthusiastic about your ideas
- Put energy in to relationships and have a unique ability to remember people’s feelings and reactions so you avoid hurting them

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**Acetylcholine**

- **Excess** puts yourself at risk for giving too much of yourself to the point of becoming harmful. Feeling that the world is taking advantage of them leading to become paranoid and retreating in to isolation
- **Deficiency** difficulty remembering things, mentally lose your enthusiasm for life. Avoiding contact with others and tension in your relationships. Can’t schedule your daily routine and time management problems. Chronically can lead to dementia and Alzheimer’s disease

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**Acetylcholine Deficiency**

- Craving fatty foods, weight gain, pain and inflammation

The body always craves what it needs. In an Acetylcholine deficiency you crave fat because that is what myelin is made up of. Myelin is the protectant around nerves which allow nerve signals to be more quickly transmitted. This contributes to the function of memory.

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**Natural Strategies to Enhance Acetylcholine**

- **Diet and Lifestyle strategies:**
  1. Allow for at least a half an hour of solitary everyday (reading, prayer, meditating, etc.)
  2. Work on making decisions based on facts and logic rather than feelings. Balance facts and feelings on decisions.
  3. Get regular aerobic exercises at 3-5 times a week. Get your heart rate up.
  4. Avoid heavy metal aluminum (cookware, baking powder, antacids)
  5. Create a calming environment with gentle music, soft bulb lights and pleasant scents such as lavender.
  6. Avoid violent films, TV, aggressive language and pornography, all which can drain acetylcholine.
- **Supplementation**
  1. Choline (from B vits) is needed for synthesis of acetylcholine.
  2. Phosphatidylserine (a phospholipid) is a major component of the cell membrane and is abundant in the brain.
  3. Sugar handling supplements such as chromium and vanadium.
  4. Antioxidants for brain protection, especially CoQ10, Vit E.

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**GABA- Stable**

*The GABA Dominant Person*

- Has the characteristics of stability, consistency, sociability and concern for others. This person is dependable with a calming nature
- Good at organization and goal setting without going overboard. They are level headed with a caretaker-type personality. Team player, nurturing and feel deep satisfaction making others comfortable

The GABA nature remains unruffled by the chaos around them.

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**GABA**

- **Excess**- nurturing taken to an extreme. Caretaking out balance with disappointment, pain and unmet personal needs. There is also craving and over valuing judgments of peers
- **Deficiency** leads to an excess of glutamate. Glutamate is the precursor to GABA. Glutamate has the opposite effect as GABA on the brain. It is Excitatory.
Neurotransmitter- Glutamate

- Glutamate- the excitatory neurotransmitter in the brain.
- Glutamate should be in balance with GABA.
- When Glutamate is high, this causes neurons in the brain to fire.
- Glutamate out of control causes negative effects in the brain (such as neuron burnout)
- Various malfunctions of the body cause Glutamate to be out of control

Glutamate Out of Control leads to a HYPERACTIVE BRAIN

The Balance of GABA (calming) and Glutamate (wired)

Symptoms of a GABA deficiency and a Glutamate Excess

- Nagging Headaches, sleep disturbances, clammy hands, muscle aches, anxiety, nervousness, irritability, allergies, tachycardia, mood swings, hypertension, fibromyalgia symptoms, depression, hyper vigilant.

These people may find addictions in things to calm them down (alcohol and marijuana) as well as pain medications.

A Side note on Glutamate and Alzheimer’s Disease

- Glutamate causes excess firing on brain neurons. Long term this leads to neuron burn out and scar tissue formation. This is demonstrated in the AD brain.
- Alzheimer’s Disease is on the rise
- We will talk about how a bad diet, toxins and stress can cause excess Glutamate firing and Alzheimer’s Disease

Natural Strategies to Enhance GABA

- Diet and Lifestyle strategies:
  1. Regular aerobic exercise
  2. Learn to balance caring for others with tending to your own needs
  3. Learn to say “NO” (no only to service but also pursuing training and growth.
  4. Take time out to play, pursue hobbies and learn new fun stuff to do
  5. Learn that you don’t need to be available to others 24/7
  6. Eat lots of fruits, veggies, whole grains and nuts
  7. Stay away from various environmental chemicals such as lead and paints
  8. Consider testing for heavy metals

- Supplementation
  1. You need specific nutrients such as Vitamin B6 and Taurine for the synthesis of GABA. B complex vitamin supplement for general NT support.
  2. N-acetylcysteine (NAC) and Magnesium Malate to counteract the response of the brain to Glutamate.
  3. Valerian root, passion flower or melatonin for relaxation

Serotonin- Playful

The Serotonin Dominant Person

- You have great ability to rest, regenerate your body and mind and thus find serenity
- You know how to live for the moment, you can be impulsive and you thrive on change
- You can be the “life of the party”, optimistic, cheerful and easy going
- You tend to enjoy the journey, not just the goal. You enjoy play and know how to make work fun
- You tend to be flexible and good at crisis management
- You tend to be intensely loyal to your relationships
Serotonin- con’t

- You are in touch with your mind and body
- Perseverance is a strong point and you are not deterred by setbacks
- You have high motor skills and excellent hand-eye coordination
- You enjoy PARTIES, CELEBRATIONS, computer and video games
- You like adventurous sports like scuba diving, sky diving, hunting, etc.
- You have a dislike for order and structure and love independence

You have many deep relationships, but refuse to be tied down (Uncle Buck)

Serotonin

- Deficiency: Serotonin is responsible for controlling your cravings and maintaining your brain’s overall balance. This neurotransmitter has a major effect upon all other neurotransmitters in the brain. As a result, a Serotonin deficiency effect many, many functions in the body and brain.

Serotonin-deficiency

- **Brain Related**
  - Feeling like you are going off the edge
  - Over excitability, over emotional
  - Insomnia or poorly rested sleep
  - Over tired and difficulty thinking clearly, depression
  - Learning difficulties

Serotonin- deficiency con’t

- **Body Related**
  - Poor temperature control
  - Constipation or IBS
  - Irregular Heart Beat, Hypertension
  - Insomnia or excessive sleep without without feeling rested
  - PMS, sexual dysfunction
  - Food and/or chemical addiction, binging
  - Arthritis and arthritic symptoms

Serotonin

*Excess* - feelings of inadequacy and inferiority. Loneliness, anger and sadness.
- Extreme nervousness, hesitancy, Distraction and vulnerable to criticism
- Painfully shy with a fear of being disliked

Serotonin Syndrome

- Too much serotonin due to adverse drug reaction (antidepressants), drug interactions or recreational drugs
- Symptoms can start within minutes of the drug interaction. Mild symptoms include **tachycardia, shivering, dilated pupils and tremors**
- More severe symptoms are high temperature, overactive reflexes, hypertension that can lead to shock. Extreme symptoms are temperatures over 106 F, **seizures** and kidney failure
Natural Strategies to Enhance Serotonin

- **Diet and Lifestyle strategies:**
  1. Regular aerobic exercise (at least 3 times a week, minimum 30 min each)
  2. Write out some long term goals since you are a live for the day person.
  3. Add introspection activities such as prayer and meditation, relaxation tapes
  4. Set aside times for peace and calm, allow your brain to rest.
  5. Serotonin types are particularly sensitive to PCBs, pesticides and plastics
  6. Eat a diet rich in tryptophan rich foods such as turkey, avocado, eggs, wheat germ, chicken, yogurt (if you don’t have a dairy allergy).

- **Supplementation:**
  1. 5-Hydroxytryptophan is needed for serotonin synthesis. Folic acid is also needed.
  2. B complex vitamins for general NT synthesis.
  3. EPA/DHA omega 3 fish oils for overall brain health.

How to Determine the Dominant Neurotransmitter in a Patient

Most authorities on neurotransmitter dominance agree that questioning people is the best way to determine how their minds work.

Even people on medications or coming off drugs and/or medications will should a pattern of responses helping you determine how they are wired.

Knowing how a person is wired can help you understand why the act and react they way they do and why (along with their history) they have a tendency for different addictions.

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All information presented tonight is taken from research journals such as the JAMA, Journal of Clinical Nutrition, Journal of Clinical Endocrinology, etc.

Jay Lombard, DO, Cornell University
Eric Braverman, MD
“75 percent of an individual’s health after age 40 is dependent upon what the person has done to his or her genes, not to the genes themselves.”
Jeffrey S. Bland, Ph.D. Genetic Nutritioneering, 1999 p. 65

“... in most cases, disease results when the individual elects a lifestyle or diet that alters the expression of the genes in such a way that the weakness or uniqueness of inheritance factors results in a phenotype we call a disease.”

Who Got Our Genes

Daddy Acetylcholine and Daughter Dopamine Walking Down the Aisle

The Root of all Health Evil in our bodies

INFLAMMATION
Main Entry: in-flam-ma-tion
Function: noun
Pronunciation: in-‘flam-ma-shen
“The reaction that occurs in the affected cells and adjacent tissues in response to an injury or abnormal stimulation caused by a physical, chemical, or biologic substance.”
Also Abnormal mental stimulation/stress!!!! (added by me)
(http://www.brockers.northwestern.edu/teichingen/Glossary Definitions/Def-4-inflammation.html)
Inflammation- Normal or Abnormal?

- **What is inflammation?** It’s a normal, natural response of the body to a perceived foreign invader or injury.
- **The purpose of inflammation is to prevent infection and start the healing process.** It’s usually in a localized area.
- **During a trauma to the body, the immune system sends in red blood cells and white blood cells to heal and prevent infection.**
- **For example, when you sprain an ankle, the body reacts to the tearing of the ligaments by becoming inflamed or swollen.**

The Problem occurs when …

- **Inflammation becomes widespread, throughout your body instead of localized and is**
- **Relentless and out of control with no end in sight.**

*If You Learn Nothing Else Tonight, Learn About Inflammation!*

Inflammation Effects on the Body

Anywhere you have water in your body you will have Inflammation!

- Joints will be stiff
- Tendons and muscles will hurt
- Any weak area of the body will be irritated
- Sinuses will be swollen
- And all the time, the body will be at war with itself, causing lack of sleep, pain and fatigue.
- Your immune system will be constantly activated
- Veins and Arteries will be inflammation increasing the risk for a stroke

NEUROTRANSMITTERS IN THE BRAIN WILL BE OUT OF BALANCE!

Inflammation Can Have a Direct Effect Upon the Communication of Neurotransmitters in the Brain

- **Inflammation causes a communication problem with neurotransmitters in the brain.**
- **This can cause either an excessive amount of a neurotransmitter or a deficiency of a neurotransmitter.**
- **Remember, even though we have a dominant neurotransmitter, we still need good functioning of all of our neurotransmitters for good mental and physical health.**
- **Either situation (excess or deficiency) will cause brain malfunction and a possible tendency for addictions.**

Neurons in the brain

"Inflammation plays an important role in the pathogenesis of Alzheimer's disease. This article reviews the results of prospective studies demonstrating that the level of systemic inflammation markers, particularly C-reactive protein and interleukin-6, can predict cognitive decline or dementia. The potential mechanisms linking systemic inflammatory molecules to cognitive decline are also discussed." 

American Journal of Alzheimer's Disease and Other Dementias®, Vol 21, No. 4, 258-262 (2006)
Inflammation has a direct effect upon Neurotransmitters

Phase I- Inflammation stimulates the neurotransmitters that are Excitatory! THIS CAN LAST FOR YEARS.
- Elevates Dopamine
- Norpinephrine
- Glutamate
- Cortisol
- Decreases GABA and Serotonin

The patient becomes... Hyper-vigilant and hyper-aroused
- Hyper-sympathetic (increased BP, and pulse)
- Insomnia
- Inflammation itself will lead to a variety of health issues

Eventually Neurotransmitters and thus, the Body Don’t react to the Stress Stimuli

Long term Inflammation will effect upon other Neurotransmitters

- Phase 2: can happen over months but usually years, from chronic inflammation. At this point, excitatory receptors (for excitatory neurotransmitters) get adapted to the inflammation and there is a type of “burn out” effect thus the effect is Inhibitory
- Decreased Acetylcholine
- Dopamine
- Glutamate
- Cortisol

The patient becomes... Lethargic and fatigued with apathy and low motivation. May have hyper-somnia apathy.
- Physically- have a depressed immune and hypotension

Top 4 Reasons For Inflammation

© Rakowski, 2006

Toxins
Unhealthy Diet
STRESS!!

A Good Diet
The Food You Eat Should Turn Into Muscle, Energy and low inflammation

A Bad Diet- Food Turns Into Fat, Fatigue and high inflammation

AN UNHEALTHY DIET
Our Body is Made Up of Trillions of Cells — Each should make energy from food

BLOOD SUGAR METABOLISM

Sugar in the blood stimulates secretion of insulin from the pancreas. Insulin binds to receptors on the membrane, triggering intracellular communication.

The mitochondria, the cell’s energy pack, takes in the sugar and turns it into energy and muscle. When Insulin Receptors don’t work, sugar doesn’t get in to the cell, to the Mitochondria to make muscle and energy. As a result food turns to fat and fatigue.

An unhealthy diet, high in refined carbohydrates, causes rapid elevation of blood sugar, high insulin and burned out receptors. Stress = Comfort Food

Remember, we crave sugar for the stimulation in a dopamine deficiency. Also for the Endorphin release when we are stressed.

When Insulin Receptors don’t work, sugar doesn’t get in to the cell, to the Mitochondria to make muscle and energy. As a result food turns to fat and fatigue.

An unhealthy diet, high in refined carbohydrates, causes rapid elevation of blood sugar, high insulin and burned out receptors. Stress = Comfort Food.

Remember, we crave sugar for the stimulation in a dopamine deficiency. Also for the Endorphin release when we are stressed.

Also, a diet of trans fats, hydrogenated and partially hydrogenated oils plus an over abundance of saturated (animal) fats can lead to poor insulin receptor function. This all leads to higher blood sugar, fat gain and inflammation.

There are between 200-2000 mitochondria per cell.
A Bad Diet Leads to Inflammation because
1. High Insulin is pro-inflammatory
2. Fat is pro-inflammatory

People crave sugar for the endorphin release through alcohol or other means, but are creating inflammation in the process, making them more depressed and craving more sugar. Recovering alcoholics crave the sugar they are now missing.

What’s Happening With the Foods You Eat?

Important Dopamine Side-Note

• A Healthy Insulin/Insulin Receptor function is needed for good dopamine function.
• People who are Insulin Resistant (a pre-Diabetic condition) will have an impairment and thus deficiency in dopamine function. As a result they will try to eat more and more sugar in order to increase Insulin and thus Dopamine. High sugar means high Insulin which leads to inflammation
• Thus we see many pre-Diabetics and Diabetics with a dopamine deficiency.

AN OVERABUNDANCE OF TOXINS

Your Body as a Flask

Your Body can only hold so many toxins before it overflows and symptoms appear
Symptoms of Toxin Buildup:

- Headaches, GI distress
- Muscular aches & pains
- Joint pain
- Fatigue, sleep disturbances
- Marked sensitivity to environmental chemicals, odors, medications, and/or nutritional supplements
- Depression, anxiety, &/or mood swings
- Cognitive dysfunction (poor memory and concentration, learning disorders)
- Paresthesias and neuropathic pain
- Recurrent infections, Allergies
- Infertility
- And more...
- Toxicity accelerates the effects of aging, both physically and mentally

Categories of External Toxicants

- **Pesticides**
  - Insecticides
  - Herbicides
- **Industrial Compounds & Chemical byproducts**
  - Volatile organics
  - Solvents & detergents
  - Toxic metals
  - Plastics
  - Insulators (asbestos)
- **Combustion/Incineration Pollutants**
- **Synthetic medications**
- **Food additives & preparation byproducts**
- **Cosmetic additives**

Toxic Metals

**MOST COMMON:**

- Arsenic
- Mercury
- Lead—consistent with dopamine deficiency and an increase incident of alcoholism
- Cadmium

**FROM INDUSTRIAL EXPOSURE:**

- Aluminum
- Nickel
- Chromium (hexavalent)
- Beryllium
- Manganese

"Over one billion tons of pesticide products are used each year in the United States."

http://www.epa.gov/pesticides/factsheets/security.htm below

WE EAT FOODS VOID OF NUTRIENTS, LOADED WITH ADDED SYNTHETIC CHEMICALS.

"He crowded his cattle onto pasture sprayed with weed killers and fertilizers. When they were half grown, he shipped them in diesel-fueled trucks to huge feedlots. There they were stuffed with corn and soy—pesticide treated of course—and implanted with synthetic hormones to make them grow faster. To prevent disease, they were given antibiotics."
Chemical Additives

• Over 10,000 food and chemical additives are allowed into U.S. food supply
  – including colorings, sweeteners, stimulants, preservatives, flavorings, emulsifiers, humectants and antimicrobials
• In 1984, 3200 tons of coal tar dyes added to foods
• Average American eats approximately 14 pounds of additives per year

Additional Environmental Toxicants

• Microbial toxins
  – Aflatoxin (peanuts)
  – Mycotoxins from molds
• Medications and “lifestyle chemicals”
  – Alcohol, caffeine, recreational drugs
  – Acetaminophen
  – Cosmetics
• Byproducts of food preparation
  – Acrylamide from French Fries
  – Nitrosamine from cold cuts and sausages
  – Polycyclic aromatic hydrocarbons from char-broiled meats

Synergistic Effects of Toxins:

When 1 + 1 = LOTS MORE THAN 2!

• Cigarette smoking:
  ↑10X risk of lung cancer
• Asbestos exposure:
  ↑5X risk of lung cancer
• Smoking + asbestos:
  ↑55X risk of lung cancer

• Total effect:
  More than additive or multiplicative

Cumulative Effect of Toxins

• Our bodies do not have the capacity to metabolize and detoxify many man-made chemicals.
• These chemicals cannot be detoxified and excreted, so the body stores them, primarily in FAT TISSUE.
• The level of stored toxins in addition to the ongoing exposure produces the cumulative effect.
• We may not see symptoms of the poisoning for many years, until it “fills our flask.”
Detox Strategies

- **7, 10, 21 Day Detox Diets** - There are numerous diets out there, the main thing is to upgrade the liver function with the appropriate nutrients
- **Gut Detox** - for elimination of bad bacteria, yeast and parasites
- **Metal Chelation** - specific nutrients to draw metals out of fat storage while upgrading the liver
- **Far Infrared Saunas** - great for liberating environmental toxins, heavy metals and to effective adjunct to the antibiotic treatment in Lyme disease

**Poor Digestion & an Unhealthy Gut**

The Healthy Gut

- The Body Should Digest Food. Keep the Good & Get Rid of the Bad
- The Gut (Stomach, Small Intestine & Large Intestine) should be full of good bacteria and free of bacteria, yeast and other pathogens

The Unhealthy Gut

- Digests food poorly creating toxins that are reabsorbed by the body. This leads to a hyperactive immune response and inflammation

Your health is a function not only of what you eat, but what you are able to assimilate and use. *Even healthy foods can be toxic!*

**What Goes Wrong #1 – Low Stomach Acid**

Adequate stomach acid is needed to break down food into healthy nutrients. Unassimilated food is very toxic to the body, and has no nutrients.

**What Goes Wrong #2 – Low Stomach Acid**

Adequate stomach acid is needed to fight off all of the bacteria and toxins entering our mouths.
“The low pH of the intragastric environment constitutes one of the major non-specific defense mechanisms of the body. Reduction of gastric acid secretion predisposes to infection with a variety of organisms . . .”

Howden, CW and Hunt, RH. Progress Report: Relationship between gastric secretion and infection. Gut 1987;28:96-107

Low Acidity = Acid Reflux

4 Good (Bad) Reasons

• Low Stomach acid means food stays in your stomach longer, which then ferments causes acidity and pressure
• Low stomach acid causes stomach bacterial infections with create heartburn
• Low Stomach acid causes yeast to grow and ferment causing pressure and heartburn
• Low stomach acid leads to food allergies and reverse peristalsis

What Goes Wrong # 3

GI distress

Symptoms of Hypochlorhydria or Low Stomach Acid

• Bloating or distention after eating
• Diarrhea or constipation
• Indigestion
• Excessive belching, burping and/or bloating
• Flatulence after eating
• Sense of fullness during and after meals (prolonged)
• Poor appetite, disinterest in food
• Offensive breath
• Bad taste in mouth
• Partial loss of taste or smell

Symptoms of Hypochlorhydria (continued)

• Difficult bowel movements
• Difficulty swallowing
• Unintentional weight loss
• Picky eater
• Spoon shaped nails
• Sores in corner of mouth
• Smooth tongue

What Goes Wrong # 4

Leaky Gut

* It is here that we find a very common problem called Leaky Gut.
* Leaky Gut is when the lining of the small intestine is destroyed.
* This happens due to our Standard American Diet (sugar, fat, caffeine, etc), Stress and Low Stomach Acid
The Gut Is A Major Entrance For Toxins

- Over the course of a lifetime the average person consumes more than 25 tons of food, which must be processed by the GI tract.
- This food may also contain damaging bacteria, viruses, parasites, yeast, toxins, food additives and antigens which may provoke allergy and inflammation in sensitive individuals
  - *Stomach acid is the first line of defense*

The gut as a Barrier

- The GI tract must somehow reduce the food components to a soluble condition so that they may be absorbed, while simultaneously excluding harmful substances including microbes and undigested food
- We need a healthy gut lining to absorb the good stuff and pass out the bad stuff

Healthy Gut vs. Leaky Gut

How a Leaky Gut Allows Toxins Into Your Body

What Causes a Leaky Gut?

- Pain Medications
- Dysbiosis (more bad bacteria than good)
- Antibiotics
- Candida (Yeast Infection)
- Steroid Medications
- Cancer Therapies
- *Chronic Stress*
- Toxic Overloads and contaminants
- Poor Food Choices (caffeine, alcohol, carbonation, saturated fats, high sugar)
- Food and environmental sensitivities

More Creators of the Leaky Gut

- Mountain Dew or energy drink in for the caffeine, carbonation and acidity and destroying of gut lining.
- Recreational drugs
- Alcohol
Unhealthy Guts - Unhealthy Body

• Poor Digestion
• Increased Toxins
• Inflammation
• Pain/Fatigue
• Brain Issues

Treatment Strategy

• The 4 R program
• Remove (bad bacteria, yeast, parasites, food allergies, irritants)
• Replace (digestive enzymes and stomach acid)
• Reinoculate (with good bacteria to push out the bad bacteria)
• Regenerate or Repair (nutrients to heal gut lining such as glutamine, zinc, folic acid and various herbs, etc.)

Inflammation Producer #4

CHRONIC 24/7 STRESS!!!!

“Life is largely a process of adaptation to the circumstances in which we exist. A perennial give and-take has been going on between living matter and its inanimate surroundings and between one living being and another ever since the dawn of life in the prehistoric oceans. The secret of health and happiness lies in successful adjustment to the everchanging conditions on this globe; the penalties for failure in this great process of adaptation are disease and unhappiness.”

Selye, Hans The Stress of Life second edition (preface xv)
ISBN 0-07-056212-1

What Should Happen # 4
Stress Should Come & Stress Should Go & Our Body Should Handle It

• Stress is necessary for survival
• “Fight or flight” reaction

What Goes Wrong - Our Stress Goes On and On and On and On......

• Acute stress – short-term stress. This is what our body was made for.
• Chronic stress – long-term unrelieved stress leads to chronic health problems.
Stages of Stress
General Adaptation Syndrome

• Alarm – “fight or flight” (short lived)
  * heart rate increases, breathing becomes rapid, digestive enzymes decrease, blood sugar levels increase

• Adaptation – if longer term response needed
  * cortisol increases, protein converts to blood sugar (then turns to fat when muscles are full), Sodium is retained to body fluid levels up and blood pressure becomes elevated
  * THIS PERSON IS STRESSED AND WIRED

• Exhaustion – if the reaction continues beyond the bodies ability to cope
  * eventually cortisol decreases and the body is unable to cope and exhaustion occurs
  * THIS PERSON IS STRESSED AND TIRED

Adrenal Exhaustion- The Stress Hormones

• Phases of hormonal exhaustion

  Stage 1- normal adaptation
  * both cortisol and DHEA increase with stress
  * usually asymptomatic

  Stage 2- early decomposition
  * cortisol increases but DHEA decline
  * “stressed”, anxiety attacks, moods swings
  AKA Adaptation * Stressed and Wired

  Stage 3- late decomposition
  * both cortisol and DHEA are now low
  * depression and exhaustion
  AKA Exhaustion * Stressed and Tired

Stress Hormone Reaction
Normal Adaptation if Short Lived

<table>
<thead>
<tr>
<th>Time of Stress Increasing</th>
<th>Cortisol</th>
<th>DHEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both hormones drop when stress is over</td>
<td></td>
<td></td>
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</table>

Stress Hormone Reaction
Adaptation Stage (Stressed & Wired)

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Adaptation- Stressed and Wired
Symptoms

• Anxiety
• Restless sleep
• Increased cholesterol/ BP
• Insulin Resistance/ weight gain
• GI disturbance
• Neurologic and cognitive problems
• Muscle loss
• Depression, reduced libido
• Reduced Immune function

Inflammation (High Cortisol) has a Direct Effect Upon Neurotransmitters

Phase I- Inflammation stimulates the neurotransmitters that are *Excitatory*!
  Elevates Dopamine
  Norepinephrine
  *** Glutamate ***
  Cortisol
  Decreases GABA and Serotonin

The patient becomes... *Hyper-vigilant and hyper-aroused*
  Hyper-sympathetic (increased Bp, and pulse)
  Insomnia

Inflammation itself will lead to a variety of health issues
Stress Leads to a Cycle of Carbohydrate Cravings

Increased Carbohydrate Intake Leads to High Insulin and More Inflammation

Stress Hormone Reaction
Exhaustion Stage (Stressed & Tired)

Rise in Hormone Level

Cortisol
DHEA
Adrenals “Burned Out”
Time of Stress Increasing

Exhaustion- Stressed and Tired

Symptoms
• Fatigue/ apathy
• Chronic pain
• Increased inflammation
• Decreased Immune function
• Muscle loss/ fat gain
• Asthma/ allergies
• Heart Disease
• Unable to perform routine tasks
• Poor Sleep

How Do You Treat Stress?
• Determine what is causing the stress and see if it can be eliminated- YOU GUYS
• If stress can’t be eliminated, learn ways to cope and get a proper perspective- YOU GUYS
• Treat the damaging effects of stress on the body (make the body strong) US GUYS
• Be proactive in preventing the damaging effects of stress on the body (Nutrition and Exercise) US GUYS

What Should Happen #5
Our Body Should Have Adequate Nutrients in It

We Don’t Because……
1. We don’t get adequate nutrients from our food.
2. The demands on our bodies (toxins and stress) burn up an excess amount of nutrients.

Nutritional Deficiencies-
2 Important Ones to Talk About

Vitamin D
Folic Acid
Vitamin D

1. We know Vitamin D is important for healthy bones.
2. Studies are now showing that Vitamin D plays some positive role in cancer prevention. Important in immunity (blood cell formation)
3. Vitamin D deficiencies are epidemic, even in the southern states where the sunshine is plentiful (Scottsdale).
4. Vitamin D plays a major role in the health of your brain.
5. Vitamin D levels needed for healthy neurotransmitter function is between 80-120 nmol/L.
6. Most levels we see in our office are below 20 and a fair amount below 10.
7. About 30% of the population can’t convert the sun to active D3. Therefore D3 should be the active form to take.

Vitamin D- Positive effects on the Brain

- Vitamin D receptors are located in the hypothalamus which may be considered the neurotransmitter center of the brain. Vitamin D is needed for overall balance of neurotransmitters via the hypothalamus.
- Vitamin D helps reduce the hyperactive effects that glutamate has on the brain. This not only has a natural cerebral calming effect but also long term is helpful in preventing neuron burnout (Alzheimer’s and Dementia). Glutamate is high and GABA low with inflammation.
- Vitamin D is an inhibitor of cortisol’s effect upon the brain that is stressed and wired = hyperactive brain. (Neurochemistry 2006, 559-9)

Mood Disorders & Behavioral Effects With A Vitamin D Deficiency

- Behavioral Effects- in experiments with rats, Vitamin D deficient rats displayed depressive like behavior and abnormal socialization. They also displayed obsessive behaviors such as obsessive grooming (Neuroscience Research 2006:354-60)
- Mood Disorders- correlations have be made in a study of over 6000 patients who had high depressive symptoms have a substantially greater risk of hip fracture due to decrease bone density (Public Health Dept 2005:71-75)
- Studies have been done which show Vitamin D deficiency is associated with anxiety and depression in Fibromyalgia (Journal of Clinical Rheumatology 2006)

Mood Disorders & Behavioral Effects With A Vitamin D Deficiency

- The prevalence of subclinical Vitamin D deficiency is between 35-85% of the population and often presents with pain and fatigue (Journal of Clinical Investigation, June 06)
- 70% of patients with Fibromyalgia demonstrated to have deficient Vitamin D levels (Clinical Rheumatology, Feb 06)
- In a study of Alzheimer’s and Vitamin D deficiency (80 patients, 40 with AD and 40 without AD), both groups of subjects that had Vitamin D deficiency had active mood disorders and significant impairments in cognitive performance (American Journal of Psychiatry, Dec 06)

Why Am I Harping on Vitamin D?

1. It’s easy to check
2. It’s Easy to Fix
3. It’s Cheap to Fix (D3)

Folic Acid- Basic Facts

- Important in development of blood cells and DNA
- Thus very important for pregnant women to adequate Folic acid to help prevent neural tube defects (birth defects)
- Important in keeping homocysteine levels low.* High Homocysteine is a risk factor for cardiovascular disease.
- Folic acid has been shown to possibly help in the prevention of colon cancer.

* Homocysteine is a byproduct of the normal metabolism of the AA methionine, (found in many proteins, etc.)
An Important Note on Folic Acid

- Folic acid is a common deficiency in alcoholics (thus a decrease in serotonin)
- Alcoholics have numerous vitamin deficiencies (especially B vitamins which are needed in neurotransmitter formation)
- People who have toxic bodies (due to all of the things we discussed) are usually vitamin depleted. It takes a lot of nutrients to get the body/liver to detox.

Folic Acid Deficiency & Your Brain

- Folic Acid is needed in the synthesis of Serotonin
  
  \[
  \text{Tryptophan} \rightarrow 5 \text{Hydroxytryptophan} \rightarrow \text{Serotonin}
  \]

- Low Folic Acid levels is associated with depression and poor response to antidepressants
- Studies have shown that lower serum levels of Folic acid were seen in depression patients who were unresponsive to SSRIs (Fava and associates)
- In a follow up study the same authors reported a higher relapse rate of depression in patients with folate deficiencies
- Folate administration has been demonstrated to augment the antidepressant effect of SSRIs and shorten the time of antidepressant effects

*** Alcoholics are usually deficient in Folic Acid ***

Folic Acid's Impact on the Brain. cont

- Folic acid is needed in the synthesis serotonin (and dopamine) thus has a major effect on depression, response to SSRIs and incident of depression relapse
- Folic acid counteracts the effects of cortisol

** Important
- Folic acid must be converted to L methylfolate for it to be biologically active
- Approximately 30% of the population have a genetic inability to convert Folate to the active and usable L methylfolate form
- The active form of folate should be taken
- Several lab testing can be done to determine this (blood testing will show a high homocysteine). A urinalysis can also be done.

Goals and Expectations for Today

- Learn about the 4 primary ways we can be neuro chemically hard wired (neurotransmitters) which will effect our tendency for behavior
- Learn about how neurotransmitters out of balance can lead to a tendency for addictions
- Learn about what dietary and lifestyle issues can cause these neurotransmitters to be out of balance
- Learn strategies to apply as an adjunct to counseling for total body and mind health

All information presented tonight is taken from research journals such as the JAMA, Journ of Clinical Nutrition, Journ of Clinical Endocrinology, etc.

Jay Lombard, DO, Cornell University

Eric Braverman, MD

Where to start? It’s All so Overwhelming

- How do you eat an elephant? One bite at a time.
- Studies show that even little long term change will have a positive effect upon health (The HALE report, JAMA)

Basic Stuff That Could Be Done

- Run a Neurotransmitter questionnaire
- Get Vitamin D levels checked
- Get Folic Acid levels checked (homocysteine)
- Food Allergy testing (especially checking Gluten sensitivity)
- Add healthy Omega 3 fish oils to the diet
Harder Stuff

- Do a 7, 10, 21 Day Detox diet
- Exercise- aerobic and anaerobic
- Eat a balanced diet of low glycemic carbs, lean clean protein and healthy omega 3 fats
- Concentrate on digestion with digestion aids and probiotics (The 4 R program)

More Stuff

- Run an adrenal test to see where cortisol levels
- Get Insulin levels checked
- Get heavy metals tested (treat with chelation)
- Run gut testing to see how specially how digestion is and what flora is like (good and bad)
- Run liver function testing

Life Pyramid

LOVE; DISCIPLINE
Think, Drink, Sleep, Eat, Poop, Move, Talk

Supplements: EPA’s, Multi’s, Plant Nutrients

Vegetables, Fruits (9+ Colorful Servings)

Lean, Clean (organic, if possible) Protein

Unprocessed Whole Grains
(mostly Gluten Free)

Pure Fats/Oils

1:1 Omega 2 to 6

Unprocessed Whole Grains
(mostly Gluten Free)

Savory

GABA

Dopamine

Acetylcholine

Serotonin

GABA

Savory

The Effects of Diet & Lifestyle on Brain Function and the Potential for Addictions

Toxins

Acetylcholine

Chronic 24/7 Stress

Serotonin

GABA

Dopamine

The Effects of Diet & Lifestyle on Brain Function and the Potential for Addictions

Commit To Your Health!

"In the battle of life it is not the critic who counts; not the man who points out how the strong man stumbled, or where the doer of a deed could have done better. The credit belongs to the man who is actually in the arena. Whose face is marred by dust and sweat and blood; who strives valiantly; who errs and comes short again and again, because there is not effort without error and shortcoming; who does actually strive to do the deeds; who knows the great enthusiasms, the great devotions, spends himself in a worthy cause; who at best knows in the end the triumph of high achievement; and who at the worst, if he fails, at least fails while daring greatly, so that his place shall never be with those cold and timid souls who have tasted neither victory nor defeat."

Theodore Roosevelt

Great Resources

- Northwoods.meta-ehealth.com
- Bluecrab@frontiernet.net (Drs Steve’s email)
- Institute of Functional Medicine (functionalmedicine.org)
- Metagenics (metagenics.com)
- Jay Lombard, DO
- Eric Braverman, MD (neurotransmitters)
- NeuroScience (Oseola, WI)
- Dirk Hanson website

Northwoods Chiropractic & Natural Healing Center

"We must all suffer one of two things; the pain of discipline or the pain of regret or disappointment."

Jim Rohn

Northwoods Chiropractic & Natural Healing Center
• End Slide show