Your Best Brain:

Ten Great Ways To Change Your Brain for the Better

Jan Hanson, M.S., L.Ac. and Rick Hanson, Ph.D. October 26, 2014

The Wellspring Institute For Neuroscience and Contemplative Wisdom

www.WiseBrain.org

www.JanHealth.com janhealth@comcast.net

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Physical Methods

Key Physical Interventions for the Brain

- Provide a complete array of nutrients.
- Get the gut right.
- Optimize serotonin.
- Increase GABA/glutamic acid ratio.
- Enhance excitatory neurotransmitters.
- Increase glutathione.
- Get hormones right.

Provide a Complete Array of Nutrients

Perspectives on Natural Methods

Potential benefits:

- Often highly effective
- Minimal side effects (pure molecules that the body knows how to metabolize)
- Readily available
- But use wisely:
 - Gather information.
 - Don't do on your own with psychotropic meds.
 - Start with low doses.
 - If something does not feel good, <u>stop</u>.
 - Make sure other co-factors are adequate (e.g., B-6, iron).
 - Consider further testing (e.g., amino acids).

Key Functions of Nutrients

Build tissue

- Act as substrate for metabolic processes
- Act as co-factors for enzymes that facilitate metabolic steps
- Act as anti-oxidants

Patient: "What do you think about the blood type diet?"

Jan: "I love it. But I don't think it matters what type you pick."

Nutrients from Food - 1

Protein:

- 3 servings a day, the size of the palm of your hand
- Animal protein: well absorbed, hypoallergenic
- Nuts and seeds
- Protein powder
- Vegetarians: consider an amino acid supplement

Vegetables and fruits:

- Vegetables: at least several cups a day
- Primary source of carbohydrates
- Fruit: eat whole fruit; be mindful of sugar content »

Nutrients from Food - 2

Grains:

- Not so much -- very high in carbohydrate
- Least bad: whole grain in kernals, not made into flour
- Gluten-free (gluten = wheat, oats, rye, barley, spelt, kamut)

Oils:

- Primary oil is olive
- No trans-fats
- Be mindful of saturated fats

Nutrients from Food - 3

Dairy:

- Try to eliminate cow dairy -- a major allergen
- Goat and sheep products are best
- Substitute with almond milk, coconut milk, etc.

Go paleolithic!

- Eat like the hunter-gatherers did -- that is your evolutionary heritage.
- Animal protein, vegetables, fruit, eggs, nuts, healthy oils.

Nutrients From Food - 4

Eat No Sugar and little refined flour . . .

If you must, eat as little sugar as possible.

- The average American eats 158 lbs per year.
- Sugar raises and dysregulates blood sugar.
- Sugar raises insulin and puts you on the road to diabetes.
- High insulin is inflammatory.
- Increased risk of Alzheimer's disease, Parkinson's and depression with diabetes
- Decreases cognitive performance

Nutrients From Food - Review

For Brain Health:

Decrease carbohydrates

Increase healthy oils

Increase vegetables

Increase protein

Supplement B-Vitamins

- Start with a good multi-vitamin/mineral supplement, with high B-vitamins (10x DVs for B's and 800 mcg folic acid, ideally as 5-methyl-tetrahydrofolate)
- Folate, B-12, and B-6 cut brain shrinkage in half in older mildly cognitively impaired adults with high homocysteine. Take B-12 under the tongue.
- Low folate predisposes people to depression.
- Folic acid + SSRI almost doubles success rate over SSRI alone.

Supplement Minerals

- The multi should have the DV or more of zinc, copper, selenium, manganese, molybdenum, chromium, iodine.
 - Typically add calcium and magnesium:
 - At least 400 mg. magnesium.
 - Women should consume at least 1000 mg. calcium.

Iron:

- A critical brain nutrient, but toxic if you get too much
- Carnivorous men usually shouldn't add iron.
- Menstruating women usually do need iron.
- It's best to test for iron with an iron panel or serum ferritin.
 A blood count helps, but can miss low iron.
- If you have fatigue and/or depression, test.

Supplement Essential Fatty Acids

- Much DHA (decosahexaenoic acid) in the brain
- DHA & EPA (ecosipentanoic acid) are important regulators of inflammation.
- EPA & DHA negatively correlate with depression (DHA has more data)
- EPA: anti-inflammatory; DHA: brain structure.
- May be preventive for Parkinson's and Alzheimer's.
- Fish oil: 500 mg. each of EPA and DHA

Supplement Essential Fatty Acids

- Vegetarians can get DHA from algae source.
- Very little value in EPA and DHA from flax oil, but if you are a devoted vegetarian, use an algae form of DHA plus flax oil.
- Use 1 tablespoon a day of flax oil (forget the capsules).
- If you are not a totally committed vegetarian, take fish oil.

Supplement Vitamin D

- Co-factor in synthesis of serotonin, dopamine, and norepinephrine
- Low levels of D are implicated in depression.
- Major support for the immune system
- May be helpful in preventing dementia and Parkinson's disease
- Made in the skin from unprotected sunlight
- Get 10 15 minutes sun mid-day; do not burn.
- Goal for D: 50 60 ng./ml. The correct test is "25-OH-vitamin D."
- If you cannot test, try 2000 I.U./day.

About Supplements

Most supplements are available at health food stores.

Some products might be hard to find. If so, you can get them at my website, <u>www.JanHealth.com</u>. Or call me, at 415/472-3663.

If you want to check the formulas of vitamin, mineral, or amino acid products at health food stores, etc., you can compare them to products on my website.

For comparisons, look on my site at the Twice Daily Multi, and BAM or All Basic Plus amino acid mixes.

Get the Gut Right

The GI Tract and the Brain

- The road to health is paved with good intestines.
 - Our gastrointestinal (GI) tract has a huge effect on our brain.
 - We can have a huge effect on our GI tract.
 - Key issues: cytokines, malabsorption, dysbiosis

GI tract effects on the brain via the immune system:

- 60 70% of the immune system is in the GI tract.
- When the GI tract is inflamed, it sends messengers called cytokines throughout the body - including the brain causing inflammation and trouble.
- By activating a particular enzyme, <u>cytokines deplete the</u> <u>brain of serotonin</u>.
- <u>Cytokines stimulate hypothalamic-pituitary stress pathway</u>, resulting in higher stress hormones, including cortisol.

GI Malabsorption

When the intestines are inflamed, malabsorption of nutrients occurs.

Malabsorption decreases amino acids, iron, folic acid, and fats. (And probably all nutrients).

We need these nutrients for brain health.

Increase Beneficial Microflora - 1

There are trillions of bacteria in the intestines.

- Beneficial bacteria protect intestinal walls, help build vitamins, and decrease inflammation and bad microbes.
- Pathogenic bacteria cause inflammation.
- Increase beneficial bacteria:
 - Eat a low sugar, low refined flour, high fiber diet.
 - Bad bugs like sugar; good bugs like fiber.
 - Some people don't tolerate fiber.
 - Supplement probiotics:
 - Lactobacillus GG (Culturelle)
 - Saccharomyces boulardii (Florastor)
 - Biffido-biffidus (particularly for kids)
 - Lactobacillus paracasei, casei, plantarum, rhamnosus, and ²² salivarius

Increase Beneficial Microflora - 2

Dosing multi-strain probiotics

- Must sustain treatment: probiotics bloom then leave within two weeks
- 5 billion CFUs (colony forming units) per day for ongoing healthy GI support
- 25-50 billion CFUs for GI repair
- 450 billion 3.6 trillion CFUs: ulcerative colitis (VSL #3)

Make your own yogurt or kefir

- Dairy-free recipes using coconut milk are on-line.
- Add your own probiotics.
- Most supermarket brands have no active probiotics.

Decrease Pathogenic Microbes

- Get rid of bad bugs: parasites, yeast overgrowth, and bacterial overgrowth.
- Decrease sugar and starch.
- You may need to test to identify pathogens. A comprehensive stool test is offered by integrative practitioners.
- Treat microbes as appropriate. If possible use natural products. Parasites usually require prescription medication, and perhaps a long treatment.

Eliminate Food Allergens

- Food allergens cause inflammation and reactivity all over the body.
 - No down side, except giving up your favorite foods
 - Dramatic effects on mood and energy
 - Particularly noticeable in children
 - The worst offenders are gluten and dairy, then soy.
 - Gluten: wheat, oats, rye, barley, spelt, kamut
 - Dairy: cow is usually worse than goat and sheep.
- Test:
 - Try a couple weeks off.
 - Or you can do an IgG antibody test (through integrative practitioners).

Optimize Serotonin

Working with Neurotransmitters

Two core functions of neurotransmitters:
 Calming down - Inhibitory
 Energizing up - Excitatory

You can supplement neurotransmitters or their co-factors - in a context of overall health.

Individual differences:

More benefit from inhibitory neurotransmitters

Inhibitory and Excitatory Neurotransmitters

Inhibitory:

Serotonin
GABA

Excitatory:

- Norepinephrine
- Dopamine
- Acetylcholine
- Glutamic acid (glutamate)

A Neuron



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Serotonin Effects

Serotonin is the key neurotransmitter for "happy and relaxed."

Serotonin is a neuro-modulator of GABA that increases its effects, and also helps decrease overactive norepinephrine, dopamine, adrenaline, and cortisol.

Major effect on depression and anxiety

Serotonin Production and Supplementation

- Tryptophan (with iron) -> 5-hydroxytryptophan (5-HTP) (with B-6 [P-5-P]) -> serotonin I----> melatonin
- Options for increasing serotonin:
 - 5-HTP, 50 200 mg./day; empty morning stomach
 - Tryptophan: 500 1500 mg./day; before bed (great for sleep)
- Stop if it doesn't feel good.

Serotonin and "Prozac Poop-Out"

- Serotonin is eliminated from the synapse through re-uptake, which SSRI's prevent, or through degradation by monoamine oxidase (MAO).
- A theory: when the uptake of serotonin is inhibited, it leaves more serotonin available for breakdown by MAO. This could increase MAO action over time, thus depleting available serotonin.
- Possibly: add a little (50 mg.) 5-HTP. Be very careful -- if it feels at all wrong, stop.

St. John's Wort

Neurochemistry:

- Many pathways of action due to molecular complexity
- Uptake inhibitor of serotonin and probably dopamine and norepinephrine; mild MAO inhibitor
- If the drug companies could make this, they would!
- Dosing: 300 mg. 3 times per day
- Concerns about decreasing the effectiveness of other medications:
 - Do not use with protease inhibitors for HIV.
 - Unproven concern with birth control pills, but be mindful

Increase GABA/Glutamic Acid Ratio

GABA and Glutamic Acid: Overview

- GABA and glutamic acid (GA) have a dance in the brain. GABA is Yin (inhibitory) and Glutamic Acid is Yang (excitatory).
- Too much GA feels like a monosodium glutamate (MSG) overdose.
 - High GA and/or low GABA are associated with:
 - Anxiety, depression, bipolar disorder
 - Migraines, seizures
 - Parkinson's disease
 - Schizophrenia
Supplement Magnesium

Supplementing magnesium increases GABA.

- Studies on migraines, seizures, and preeclampsia found magnesium to be effective.
 - Take 400 1000 mg. magnesium.
 - Magnesium citrate will likely be a laxative.
 - Magnesium glycinate is not usually a laxative.

Supplement Vitamin B-6

Glutamic acid --> GABA

- Vitamin B-6 as Pyridoxal-5-Phosphate (P-5-P) is the key nutritional co-factor that shifts the balance in the direction of GABA.
- Take 50 mg./day of P-5-P on an empty stomach.
- Many don't make P-5-P from pyridoxine effectively.
- Often deficient in women on birth control pills

Supplement Taurine

- Taurine binds to GABA receptors, thus stimulating GABA-like activity.
- It stimulates enzymes that make GABA, and inhibits enzymes that break it down.
- It's typically a benign amino acid, also depleted during breastfeeding.
- Consider 1000 mg./day (maybe more).

Supplement Melatonin

Melatonin blocks the main glutamate receptor.

- Get good sleep. Take the time. Sleep is perhaps the most restorative activity for the brain.
- For sleep, use 1 3 mg. melatonin before bed, or a smaller amount for middle-of-the-night waking. Try sublingual preparations.

Melatonin Zn Se distributes melatonin throughout the night.

Supplement Theanine

Theanine is an amino acid found in green tea and added to soft drinks in Japan (!).

It is "antagonistic" to glutamic acid.

Consider 100 - 200 mg./day.

Supplement GABA

- Theoretically, GABA does not cross the blood-brain barrier, but many people do report a calming effect.
- Possibly there is a "leaky brain syndrome" allowing GABA to get through.
- Several studies show efficacy of GABA with anxiety.
- Consider 500 1500 mg./day on an empty stomach.

Supplement Progesterone

For women only . . .

- Progesterone stimulates GABA receptors, triggering a GABA-like effect.
- Approaching menopause, progesterone decreases before estrogen does, so supplementing progesterone may be helpful.
- Consider Pro-Gest cream, during the second half of your cycle.

Possible Daily Supplements for Enhancing GABA/Glutamic Acid Ratio

- Magnesium: 400 1000 mg. citrate (lax.) or glycinate (non-lax.)
- Vitamin B6 as P-5-P: 50 mg. on an empty stomach
- Taurine: 1000 mg. (or more) on an empty stomach (in a.m.)
- Melatonin 1-3 mg.
- Theanine: 100 200 mg.
- GABA: 250 750 mg.
- Progesterone cream (women only)
- Tryptophan or 5-HTP to enhance serotonin --> modulates GABA

Enhance Excitatory Neurotransmitters

Enhance Dopamine, Norepinephrine

- Increase dopamine and norepinephrine, which support attention, energy, and mood.
- Phenylalanine (with iron) -> tyrosine (with P-5-P) -> dopamine -> norepinephrine
- Tyrosine also builds thyroid hormone.
- On a foundation of good serotonin, supplement:
 - 500-1000 mg./day of L-Phenylalanine or L-Tyrosine (empty stomach in the morning)
 - 50 mg./day of P-5-P (empty stomach in the morning)
 - Supplement iron as indicated by testing.

Enhance Acetylcholine - 1

Phosphatidylserine:

- A structural component of a neuron's membrane
- Enhances acetylcholine release
- Calms stress pathways in the brain, reducing cortisol
- Many studies show decreased cognitive decline with aging
- 100 300 mg./day

Enhance Acetylcholine - 2

- Alpha GPC (glycerylphosphorylcholine) stimulates manufacture of new acetylcholine by providing a supply of choline for neurons.
- Stimulates release of GABA
- Benefits shown for memory, stroke, Alzheimer's, and vascular dementia
- Try 300 600 mg. (by prescription in Europe)

Enhance Acetylcholine - 3

- Huperzine A is extracted from Chinese club moss. It helps prevent breakdown of acetylcholine.
- Some studies have shown effectiveness with Alzheimer's disease; one study showed improved memory in adolescents.
- 50 200 mg./day. Start slow. Although studies say no side effects, I have seen them.

Broad Neurotransmitter Increase

- When fatigue is an issue, even chronic fatigue, a complete amino acid blend can be very useful.
 - Taken on an empty stomach, it temporarily but strongly boosts amino acids levels.
 - The theory is that it primes the pump and gets the body and brain going.
 - Use a free amino acid balanced blend.
 - Take on an empty stomach, 30 minutes before food in the morning.
 - 3 10 grams
 - Can modify with amino acid testing (from integrative practitioners).
 - Make sure vitamin and mineral co-factors are present.⁵⁰

Bonus #6 Increase Glutathione

- Increase glutathione, perhaps the most important anti-oxidant in the brain.
 - Lipoic acid: 100 600 mg. per day.
 - Consider R-Lipoic form.
 - Consider time-release lipoic acid.
 - NAC (N-Acetyl-Cysteine)
 - Most important building block of glutathione
 - May benefit the GABA/Glutamic Acid ratio
 - May be hard to tolerate on the digestive system
 - Try 500 2000 mg. per day on an empty stomach.
 - Oral glutathione is not well absorbed.

Bonus #7: Hormones

- Check thyroid if fatigue is a factor.
 - TSH should ideally be under 2.00, but certainly under 3.00.
- Estrogen does many good things for the brain:
 - Improves mood
 - Supports memory
 - Helps prevent dementia
- Menopausal women should test estrogen levels and consider supplementation.
 - Always bioidentical
 - Always transdermal -- patch, cream, or spray

Bonus #7: Hormones

- Various studies of bio-identical estradiol showed a decreased risk of dementia of 20% - 40%. (Hathaway review in Townsend Letter, 2012.
- 2014 Stanford imaging study showed that bio-idential estradiol -- not Premarin -- protected areas of the brain that decline with approaching Alzheimers Disease.
- WHI study found that Prempro -- Premarin with Provera -increased breast cancer, but that Premarin alone actually decreased it (although not statistically significant).

Mental Methods



Neurons that fire together,

wire together.

Key Mental Interventions for the Brain

Be on your own side.

Be mindful.

Take in the good.

Rest in love.

Come home to happiness.

Be on Your Own Side

The good life, as I conceive it, is a happy life. I do not mean that if you are good you will be happy; I mean that if you are happy you will be good.

Bertrand Russell

Self-Compassion

- Compassion is the warmhearted wish that a being not suffer.
- Self-compassion applies this wish to oneself.
- It increases resilience and self-worth.
 - To strengthen it:
 - Get the sense of being cared about.
 - Bring to mind others you feel compassion for.
 - Shift the compassion to yourself.

"Anthem"

Ring the bells that still can ring Forget your perfect offering There is a crack in everything That's how the light gets in That's how the light gets in

Leonard Cohen

Be Mindful

The education of attention would be the education par excellence

William James

Self-Focused (blue) and Open Awareness (red) Conditions (following 8 weeks of MT)



Farb, et al. 2007. Social Cognitive Affective Neuroscience, 2:313-322

Staying Present in the Present

- Finding a simple object of attention such as the sensations of breathing
- Allowing thoughts and feelings to come and go while disengaging from them.
- Relaxing . . . Staying present . . . Perhaps finding some warm feelings for yourself and others
- Finding the simplicity in be-ing

Take in the Good

INNER STRENGTHS ARE BUILT FROM BRAIN STRUCTURE



The Neuropsychology of Learning

Learning – changing neural structure and function – proceeds in two stages:

From state to trait

From activation to installation

From <u>short-term</u> memory buffers to <u>long-term</u> storage You become more compassionate by repeatedly installing experiences of compassion.

You become more grateful by repeatedly installing experiences of gratitude.

You become more mindful by repeatedly installing experiences of mindfulness. We're good at activation but bad at installation.

This is the fundamental weakness in most patient education, human resources training, psychotherapy, coaching, and mindfulness training.

Velcro for Bad, Teflon for Good

The negativity bias

sood experience



The Negativity Bias
Stone age brains in the 21st century



Learning to Take in the Good



Have a Good Experience











Link Positive and Negative Material

HEAL by Taking in the Good

- 1. <u>Have</u> a beneficial experience.
- 2. <u>Enrich</u> it.
- 3. <u>Absorb</u> it.
- 4. Link beneficial and painful material. [optional]



Have It, Enjoy It

Growing Gratitude

- Think of things you feel grateful for . . . Let this become a feeling of gratitude.
- Stay with this experience . . . Open to it.
 - Imagine or sense that gratitude is sinking into you . . . As you sink into it.

Think not lightly of good, saying, "It will not come to me."

Drop by drop is the water pot filled.

Likewise, the wise one, gathering it little by little, fills oneself with good.

Dhammapada 9.122

Rest in Love

The Social Brain

- Social capabilities have been a primary driver of brain evolution.
- Reptiles and fish avoid and approach. Mammals and birds attach as well - especially primates and humans.
- Mammals and birds have bigger brains than reptiles and fish.
- The more social the primate species, the bigger the cortex.
- Since the first hominids began making tools ~ 2.5 million years ago, the brain has roughly tripled in size, much of its build-out devoted to social functions (e.g., cooperative planning, empathy, language). The growing brain needed a longer childhood, which required greater pair bonding and band cohesion.





If we could read the secret history of our enemies, we should find in each [person's] life sorrow and suffering enough to disarm any hostility.

Henry Wadsworth Longfellow

Compassion and Kindness

- We can strengthen the neural substrates of empathy, compassion, kindness, and love
 - Good wishes: safety, health, happiness, ease
- All beings, "omitting none"
 - Benefactor
 - Friend
 - Neutral person
 - Oneself
 - Difficult person

Come Home to Happiness



Our Three Fundamental Needs

Safety

Satisfaction

Connection

Pet the Lizard



Feed the Mouse



Hug the Monkey



The Responsive Mode



The Reactive Mode









Reactive Mode

Responsive Mode



Peace

Contentment

Love

Thank you

Great Books

See <u>www.RickHanson.net</u> for other great books.

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