

# **The Addicted Brain & How to Break Free**

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# Biography: Hyla Cass, M.D.

- Integrative medicine and psychiatry: clinical practice, writings, lectures, and media
- Medical Advisory Board: Health Sciences Institute
- Associate Editor, Total Health Former Board Member American College for Advancement in Medicine (acam.org); California Citizens for Health
- Author of *Natural Highs*, *8 Weeks to Vibrant Health*, *Supplement Your Prescription*, *The Addicted Brain & How to Break Free*, and others
- Radio, TV (Dr. Oz, The View, E! Entertainment, etc)

# Learning Objectives

1. Internal biochemistry including levels of blood sugar, hormones, & NTs affect mood & cognition & lead to addiction
2. Specific lab testing can help determine imbalance
3. Imbalances in biochemistry can be treated with specific supplements (vitamins, minerals, amino acids, herbs)
4. Using appropriate precautions, supplements can be used adjunctively both to enhance pharmaceutical effects, to allow for lower dosing, and to aid in medication discontinuation.

# Overview



- How to discover brain imbalances
- How the brain works
- How to intervene with lifestyle, diet, and supplements
- How to not only overcome symptoms, but achieve potential brain power

# Addiction Basics

- Genetic
- Moral issue? Will power?
- Psychosocial aspects
- Biochemical

# Are We Programmed for Addiction?

- Inborn deficiency (in dopamine/motivator receptors) -> “Reward Deficiency Syndrome (RDS)”
- “Self –medicate” in the form of drugs, alcohol, or thrill-seeking, dangerous behavior to feel energized, motivated or happy.

# Are We Programmed for Addiction?

Ernest Noble & Ken Blum UCLA: Found 52% of cocaine addicts have the A1 allele of the dopamine D2 receptor gene, vs only 21% of nonaddicts.

- Prevalence of A1 allele increases significantly with 3 risk factors  
Parental alcoholism and drug abuse
- Potency of the cocaine used by the addict (intranasal versus "crack" cocaine)
- Early-childhood deviant behavior, such as conduct disorder.

With all three of these risk factors, prevalence of A1 allele rises to 87%, suggesting that childhood behavioral disorders may signal a genetic predisposition to drug or alcohol addiction (Noble *et al.* 1993).

Ernest P. Noble, PhD, MD; Kenneth Blum, PhD

**Alcoholism and the D2 Dopamine Receptor Gene**

*JAMA.* 1993

# Is it psychological?

- Rats fed junk food became addicted versus healthy diet
- “Alcoholic” rats treated with amino acids lost their cravings and addiction
- Predisposition only: you are not a slave to your genes!





# Biochemical factors

- Nutrient and neurotransmitter deficiencies
- Specific laboratory testing
- Provide needed vitamins, minerals, and amino acids.

# Medical Aspects

- Rule out medical conditions affecting brain function
- Food allergy
- Dysglycemia
- Thyroid
- Adrenal
- Sex hormone imbalances
- History, physical, labs as indicated

# Other Causes of Addiction:

- Stress; stimulants
- Dopamine-> adrenaline and noradrenaline-released when we are stressed or use stimulants
- Generates energy by mobilizing glucose -> alert, energized, focused
- We can become addicted to our own feel-good hormones: “stress junkies”
- If low serotonin-> eat carbs to feel good

Nestler Eric J. Is there a common molecular pathway for addiction?  
Nature Neuroscience. Published Online 26 October 2005.

# Laboratory Testing

- CBC
- Chem panel w fasting glucose
- If indicated:
- Hbg A1C (glycohemoglobin)
- Amino acids (plasma,urine)
- RBC vitamins and minerals
- Essential fatty acids
- Organic acids (metametrix.com)
- Neurotransmitters (urine, red cell)
- Hormones :
  - Thyroid (T3,T4,TSH)
  - Cortisol
  - DHEA-S
  - Estradiol
  - Progesterone
  - Testosterone

# Basic Requirements

- Biochemical Individuality
- Synergy of nutrients
- Deficiencies: laboratory testing
- Specific supplementation with vitamins, minerals, amino acids, and herbs
  - mood, memory, cognition,
- Interrupts cravings for sugar/carbs, caffeine, alcohol

# Natural Solutions

- Lifestyle changes
- Psychotherapy eg EFT (Emotional Freedom Technique), EMDR (Eye Movement Desensitization & Reprocessing; EMDR.org), TFT (Thought Field Therapy)
- *Mind-body* techniques:
- Meditation, neurofeedback, guided imagery

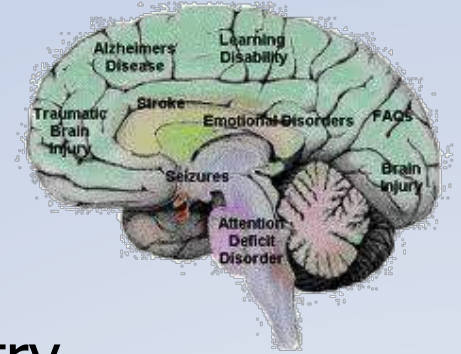
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# Natural Solutions (cont'd)

- **Nutritional** (*body-mind*)
- Balance blood sugar
- Supply safe, effective alternatives to substances of abuse, antidepressants, anti-anxiety agents, with specific precursors and co-factors to restore brain and body chemistry
- i.e. Treat underlying imbalance

# Brain Facts



The brain is an organ, affected by body chemistry  
Weighs only 3 lbs, but uses 20% of glucose, O<sub>2</sub>, nutrients

**Neurons** communicate via **neurotransmitters**

- Made from **brain nutrients**
- So are the **receptor sites**
- Influenced by your individual biochemistry



# Basic Requirements

- Biochemical Individuality – genetics, environment
- Synergy of nutrients – You are what you eat!
- Deficiencies, toxicities: laboratory testing
- Specific supplementation with vitamins, minerals, amino acids, and herbs:
  - Balances mood
  - Often sufficient to stop the cravings for sugar/ carbs, caffeine, alcohol, even gambling, shopping!
  - Important in wt loss plan vs ‘will-power’

## Downsides of Sugar:

- Toxic when consumed in excess
- Goes into storage as quickly as possible
- ‘Rebound’ low blood sugar-> cranky
- Low blood sugar slump

Avena Nicole, et al. Evidence for sugar addiction: Behavioral and neurochemical effects of intermittent, excessive sugar intake. *Neuroscience Biobehavioral Review*. 2008;32(1):20-39

# Brain: Food Basics

“Let food be thy medicine”

- Carbohydrates as brain fuel (=>glucose)
- Protein for amino acids (=> neurotransmitters)
- Smart fats (omega 3s)
- Antioxidants, vitamins and minerals
- Phospholipids
- Water



# Carbs:

## Low Blood Sugar

- Difficulty concentrating
- Palpitations
- Fainting, dizziness or shakiness
- Night sweats
- Excessive thirst
- Chronic fatigue
- Frequent mood swings
- Forgetfulness or confusion
- Tendency to depression
- Anxiety or irritability
- Feeling weak
- Aggressive outbursts or crying spells

Ibid

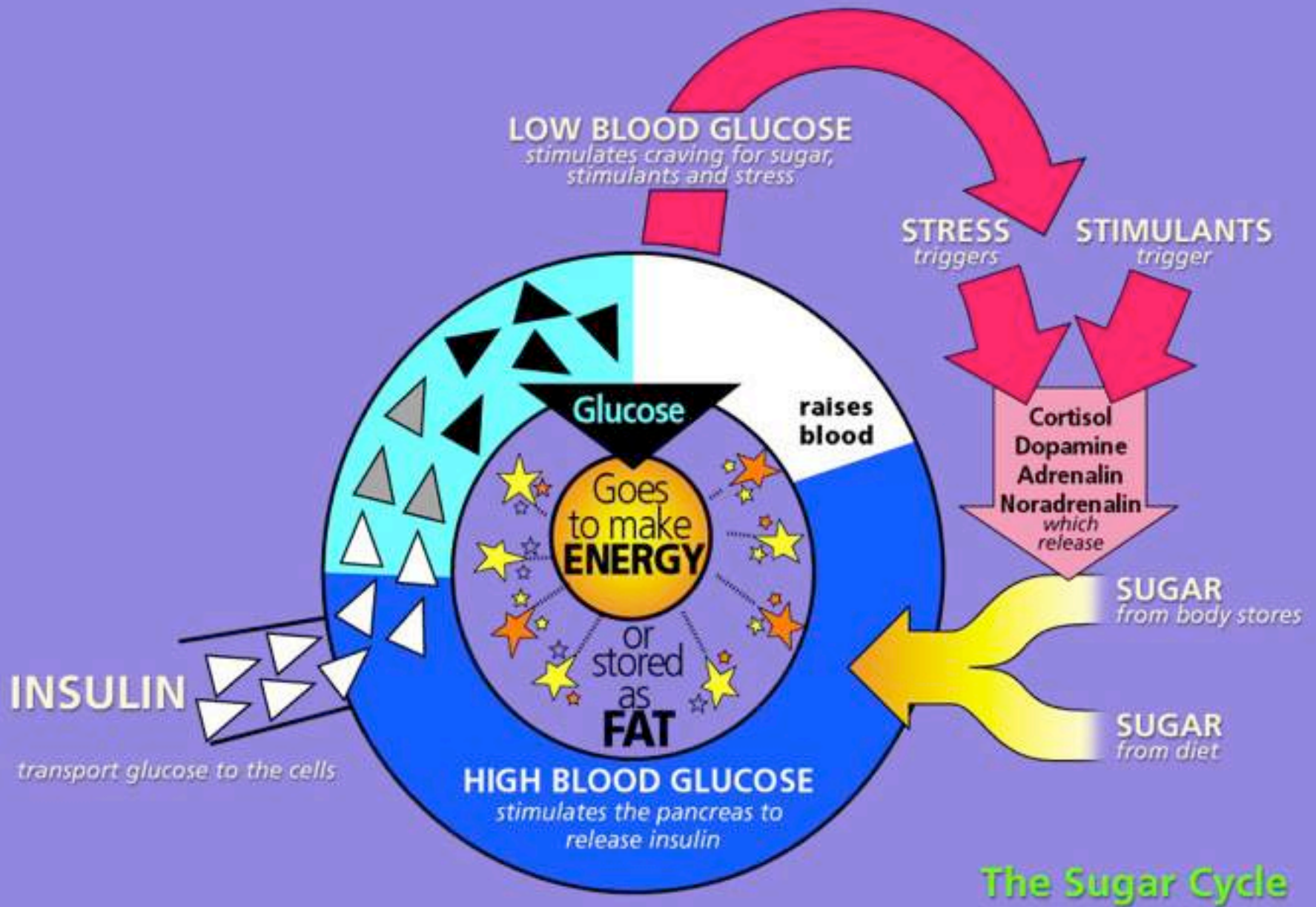
# The Addicted Brain



# Blood Sugar Regulation

- Refined carbs, low *glycemic index* or *glycemic load*
- Rapid rise of blood sugar: *sugar high*
  - Insulin release sweeps it into the cells
  - Drop in blood sugar
  - Adrenalin release
  - Fight or flight, sympathetic nervous system response
  - **Anxiety symptoms**
  - Ultimately, develop insulin resistance

D. Benton The impact of the supply of glucose to the brain on mood and memory, Nutr Rev Vol 59, S20-21, 2001.



# The Addicted Brain





# Downsides of Alcohol:

- Depressant, accidents
- GI, liver, and brain damage
- Vitamin depletion
- Need to repair and replete
- Liver support/rebuild

# The Addicted Brain



# Downsides of caffeine

Overstimulation of the central nervous system, irritability, insomnia and rapid and irregular heartbeats, hypertension, GI problems (eg ulcers)

Caffeine. Natural Medicines Comprehensive Database. <http://www.naturaldatabase.com>. Accessed Dec. 9, 2010.

Nehlig, A., Daval, J., Debry, G. Caffeine and the central nervous system: Mechanisms of action, biochemical, metabolic and psychostimulant effects. *Brain Res Rev*, 17 (1992): 139-170.

# Downsides of caffeine

## **American Psychiatric Association:**

classifies caffeine as a substance...intoxication can present with disturbance in thinking, judgment, perception, attention, motor activity, and social functioning (1994). Caffeine toxicity can induce restlessness, agitation, irritability, confusion, and delerium.

Diagnostic and Statistical Manual of Mental Disorders Fourth Edition.  
Washington: APA, 1994

- substantially suppresses calcitriol receptor →  
Vit D deficiency ss
- Rapuri PB, et al 2007. *J. Steroid Biochem. Mol. Biol.* **103** (3–5): 368–71.

# Downsides of Psychotropic (psychiatric) Medication:

- Antidepressants, tranquilizers
- Band-aid approach: useful but insufficient
- Not addressing basic imbalance
- Side effects including addiction; replacing one with another; be careful!

# Diet and Supplements

- Often sufficient to stop the cravings for carbs cocaine, heroin, benzodiazepines, sugar, caffeine; habits like gambling, shopaholic
- Substitution of sugar, caffeine, etc for drug of choice perpetuates the addictive cycle

# Basic Requirements

Raw materials from diet:

- Carbohydrates, fats, protein (amino acids)
- Vitamins, minerals, flavonoids:  
Co-factors to catalyze the chemical processes; antioxidants, neuroprotective

# Basic Requirements

- Neurotransmitters: our brain messengers
- Imbalance here leads to cravings, addiction, withdrawal
- End addictions by restoring balance



# Mind- and Mood-Enhancing Neurotransmitters: Your Chemical Messengers

- **GABA** - dampens, calms, balances
- **Dopamine, Adrenaline & Noradrenaline** - energizing, focus, stress response, “feel-good”
- **Serotonin** - mood enhancement
- **Endorphins** - euphoria, pain control
- **Acetylcholine** - memory and alertness.

# Dynamics of addiction

- Down regulation: 'tolerance'- need increasingly more stimulant for effect
- Vicious cycle of stimulant dependence and fatigue
- Original fatigue (leading to stimulant cravings) can have many sources, including poor sleep and diet, chronic infection, and hormone imbalances.

# Natural Solutions: Natural Mood Elevators, Energizers

Amino acid precursors to dopamine:

- Tyrosine -500-2000 mg daily
- D,L-Phenylalanine (DLPA)- 500-2000 mg daily
- Supports replacing stimulant meds and drugs (eg cocaine, amphetamines)
- No over- stimulation, no let-down

# Natural Solutions: Natural Mood Elevators, Energizers

- Amino acid precursors to serotonin:
- Depleted by long-term SSRI use
- Replace SSRIs and other serotonin enhancers both in tx of depression, anxiety, drug withdrawal/maintenance
- Needs B6 and other micronutrient co-factors, found in high quality, high potency multi

# Natural Solutions: Natural Mood Elevators, Energizers

5-hydroxytryptophan -5HTP (100-300 mg)

- L-tryptophane (500-2000 mg)
  - Needs carb/insulin response to cross blood brain barrier
  - B6 as co-factor

Dean et al, J Psychiatry Neurosci. 2011 March; 36(2):  
78–86. *N*-acetylcysteine in psychiatry:  
current therapeutic evidence and potential mechanisms of action

# Natural Solutions: N-Acetylcysteine (NAC) for addiction

- NAC is emerging as a useful agent in the treatment of addiction/cravings
- Studies in addiction: food, gambling, nicotine, cocaine, cannabis (2400 mg/day)
- Precursor to glutathione, master antioxidant, anti-inflammatory
- Psychiatric illness related to brain inflammation

Dean et al, J Psychiatry Neurosci. 2011 March; 36(2): 78–86. *N*-acetylcysteine in psychiatry: current therapeutic evidence and potential mechanisms of action

# Omega 3 Fatty Acids

- Mood, mind and memory booster: depression, bipolar, ADD/ADHD
- Building material for brain cell membranes and neurotransmitter receptor sites
- Increase acetylcholine and serotonin levels
- Precursor for prostaglandins, chemicals that influence mood and behavior
- Anti-inflammatory
- **Dose:** 250-3000 mg a day as a fish oil supplement or eat fatty fish three times a week

## References on Omega-3's

- Frangou S, Lewis M, McCrone P. Efficacy of ethyl-eicosapentaenoic acid in bipolar depression: randomised double-blind placebo-controlled study. *Br J Psychiatry*. 2006 Jan;188:46-50.
- Freund-Levi Y, Eriksdotter-Jonhagen M, Cederholm T, et al. Omega-3 fatty acid treatment in 174 patients with mild to moderate Alzheimer disease: Omega-3 AD study: a randomized double-blind trial. *Arch Neurol*. 2006 Oct;63(10):1402-8.
- Osher Y, Belmaker RH, Nemets B. Clinical trials of PUFAs in depression: State of the art. *World J Biol Psychiatry*. 2006;7(4):223-30.



# Brain Cell Supplements

## **TWICE DAILY:**

- Multi for co-factors, anti-oxidants
- Vit C – 1 gm
- Omega 3 oil (fish oil)/Krill - 1-2 gms
- Methylating nutrients --B12-Folate, B-Complex
- Acetylcholine enhancers (memory, cognition) – Phosphatidyl Choline, Phosphatidyl Serine, DMAE, Acetyl-L- Carnitine

# Adrenal Support

- For most (all?) of these individuals
- Amino acids (tyrosine, TMG)
- B Vits, especially B5; magnesium
- Adaptogens - rhodiola, reishi, eleuthero
- Boosts energy, focus, and endurance

# Calming Nutrients

## **Amino acids**

- GABA – issues re BBB?
- L- Theanine
- Taurine
- L- Glutamine

## **Herbs**

- Hops, passion flower, lemon balm, valerian
- Useful for sleep too esp w increased valerian

# Combination Formula

- Natural nutrient "shield" protects mind & body from harmful effects of daily stress
- Enhances mood
- Sharpens mental acuity
- Supports inner calm and balance
- No drowsiness
- Use instead of sedating meds for withdrawal from both uppers and downers

# Sample Protocols

For neurotransmitter balance especially in  
addiction & antidepressant recovery—  
best to avoid/minimize medication and use  
targeted nutrient support

# Withdrawing from Alcohol, Sedatives or Stimulants

- **Multi** vitamin-mineral formula
- Chromium (200 mcg) and **glutamine (500 mg twice daily) and also as needed for cravings**, to regulate blood sugar, reducing brain fog and cravings for sugar, alcohol, or drugs.
- 5-HTP- 100-300 mg 3x/day to boost serotonin levels both for depression and sleep problems (take separately from SSRI by 2 hr or more)

# Withdrawing from Alcohol or Stimulants #2

- Calming herbs valerian 100 mg (or 100-200 at bedtime)
- L-Theanine 200 mg 1-2 x daily
- Tyrosine (500-1000 mg) or phenylalanine (500-1000 mg) 2-3x/day to boost dopamine for enhanced mood and concentration, especially in the morning, or BID

# Withdrawing from Alcohol or Stimulants #3

- Specific brain cell nutrients – PS (100 mg) and PC or Citicholine 100 mg), acetyl-l-carnitine (500 mg), ginkgo (60 - 90 mg) to enhance acetylcholine, brain blood flow and brain cell health
- “Adaptogenic” herbs such as reishi, eleuthero, rhodiola + cofactors to support adrenal glands depleted by stress.
- Deliver as formulas for better compliance



# Withdrawing from Alcohol or Stimulants #4

- Omega 3 fatty acids in the form of fish oil 1000 mg twice daily to help restore the cell wall in which neurotransmitters are made
- Extra B vitamins (500-100 mg) and magnesium 200 mg (may be found in a high potency multi) to handle the depletion due to addiction and stress; needed as co-factors

# Lifestyle, Diet, and Supplements

- Begin with healthy diet
- Eliminate smoking, sugar, caffeine
- Exercise
- Restorative sleep - amount, quality
- Add supplements (vitamins, minerals, amino acids, herbs) to correct underlying chemical imbalances
- Remove meds and substances gradually
- Address psychological and spiritual aspects
- Wide range of available lifestyle techniques, including meditation, visualization, biofeedback, music, massage, yoga, movement and dance

# Thank you!

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