

# **Biochemical and Nutritional Interventions for ADHD and Behavioral Disorders**

**Presented by**

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**Walsh Research Institute**

**In collaboration with**

**Natural Health Research Institute**

# About Natural Health Research Institute

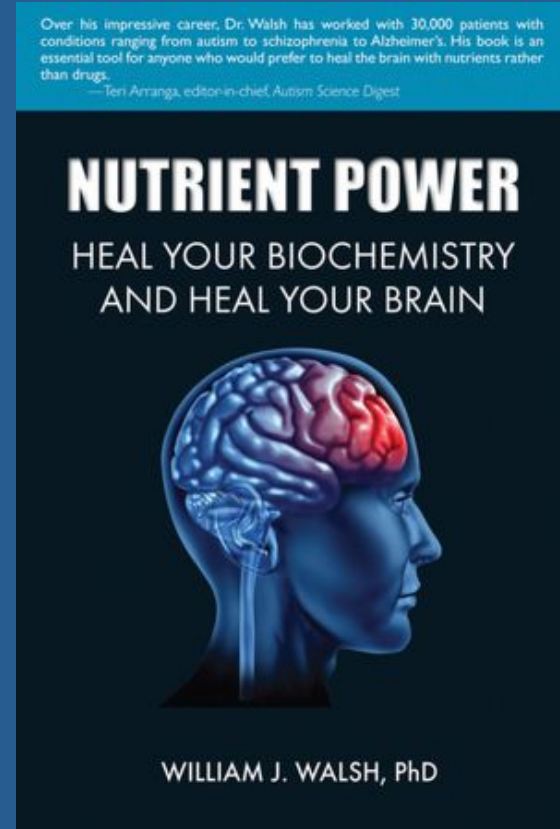
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- (NHRI) is an independent, non-profit organization that supports science-based research on natural health and wellness.
- They are committed to informing consumers, scientists, the media, policymakers and legislators about scientific evidence on the usefulness and cost-effectiveness of diet, supplements and a healthy lifestyle to improve health and wellness, and reduce disease around the world.
- Stay in touch with the latest research and sign up for the NHRI's monthly newsletter at [www.naturalhealthresearch.org](http://www.naturalhealthresearch.org).



William J. Walsh, PhD, FACN  
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*100% of Nutrient Power book sales is used to further the mission of the non-profit Walsh Research Institute.*

[www.walshinstitute.org](http://www.walshinstitute.org)

# Walsh Research Institute

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- **Public Charity**
- **Expertise in Brain Disorders**
- **Physician Training**
- **Research**

# ADHD Database

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- **5,600 patients**
- **> 500,000 blood/urine chemistries**
- **> 350,000 medical history factors.**

# High-Incidence Chemical Imbalances in ADHD

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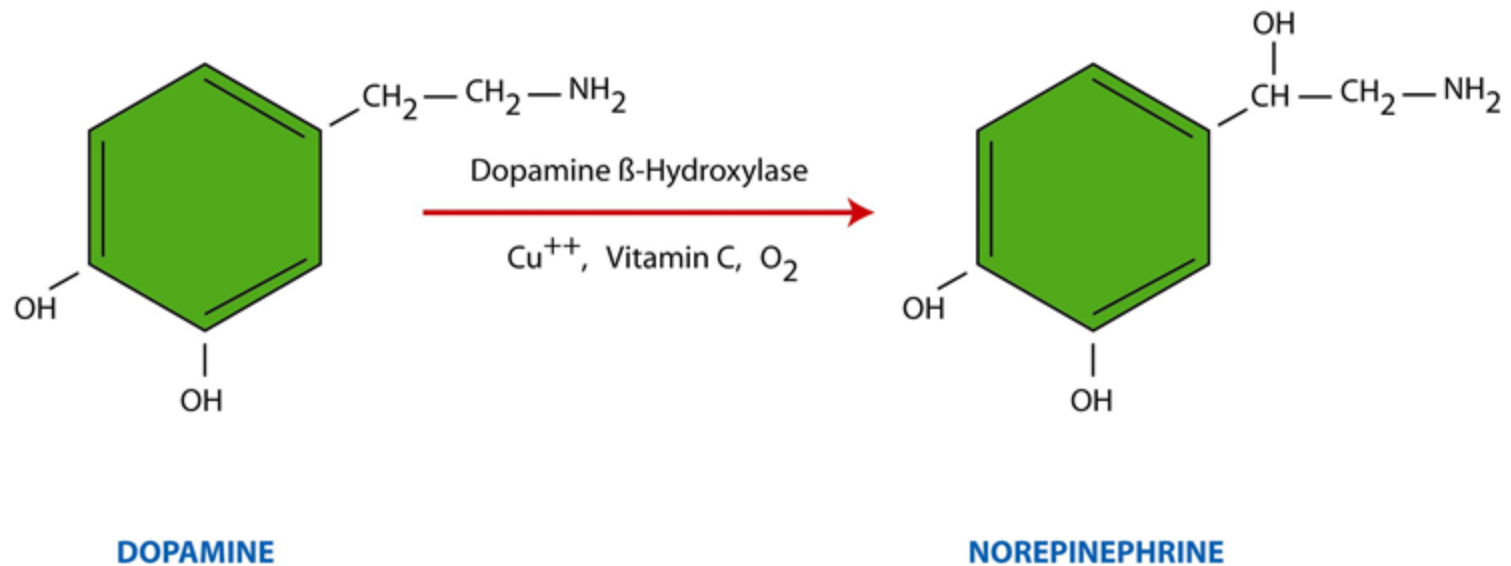
1. Elevated Cu (68%)
2. Insufficient ceruloplasmin (92%)
3. Zinc depletion (96%)
4. Methylation disorder (55%)
5. Pyrrole Disorder (30%)
6. Malabsorption (11%)

# Copper Imbalance and ADHD

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- **Cu levels regulated by metallothionein (MT).**
- **SNP mutations can weaken MT function resulting in Cu overload and Zn deficiency.**
- **Excess Cu can severely deplete dopamine levels.**
- **Low dopamine function is associated with ADHD.**

# Norepinephrine Synthesis





# Individualized Nutrient Therapy

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- **Medical history and review of symptoms**
- **Special blood/urine lab tests**
- **Diagnosis of chemical imbalances**
- **Prescribed nutrient program to normalize brain chemistry and neurotransmission.**

# Major ADHD Types

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**1. Inattention**

**2. Hyperactivity – Impulsivity**

**3. Combination of Types 1 and 2**

# Typical Inattention Biochemistry

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- **Low dopamine activity**
- **Copper excess**
- **Low GABA activity**
- **Zinc deficiency**

# Treatment Approach - Inattentive ADHD

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- Increase neurotransmission at dopamine and GABA receptors,
- Inhibit expression of DAT reuptake proteins and promote GABA synthesis,
- Methionine, Zn, B-6 and augmenting nutrients.

# Case History – George (Age 10)

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- Good behavior & motivation, very poor concentration,
- ADHD Diagnosis; Special Ed, Ritalin,
- Serum Cu = 163 mcg/dL, plasma Zn = 68 mcg/dL, Histamine = 82 ng/ml,

Treated with Zn, B-6, Se, methionine, Vitamins C, E.

# Treatment Outcome - George

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- **Ritalin continued during initial nutrient therapy,**
- **No improvement during first 3 weeks,**
- **3 months later: Academics improved, special education discontinued, Ritalin discontinued.**

# Hyperactivity

## Typical Biochemistry

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- **Excessive activity at norepinephrine and adrenaline receptors**
- **Copper overload**
- **Overmethylation**

# Treatment Approach

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- Reduce norepinephrine and adrenaline neurotransmission,
- Normalize serum Cu and plasma Zn,
- Folate, B-12 Zn, B-6, GABA, and augmenting nutrients.



# Case History - Peter

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- **Age 10, hyperactive, poor concentration, failing in school,**
- **ADHD diagnosis, some improvement after Adderall, weight loss,**
- **Cu/Zn ratio = 1.8 (very elevated). Other chemistries in normal range.**

# Treatment Outcome - Peter

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- **Adderall continued during initial three months.**
- **Hyperactivity: Slightly worse during week 1, followed by gradual improvement.**
- **After 3 months: Improved concentration and academics, Adderall discontinued.**

# Incidence of Behavior Disorder in ADHD

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- **Episodic Rage Disorder = 50%**
- **Oppositional Defiant Disorder = 35%**
- **Conduct Disorder = 20%**
- **Antisocial Personality Disorder = 4%**

# Treatment of Oppositional Defiance

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- Enhance neurotransmission at serotonin and NMDA receptors,
- SAMe or methionine to enhance expression of SERT reuptake gene; Avoid folate supplements,
- Promote glutamate activity at NMDA with antioxidants Zn, Se, GSH, etc.

# Case History – Mary (Age 10)

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- Very strong will, oppositional to authority, defiant, intelligent but refusal to study,
- Special classroom, counseling, Vivance medication,
- Histamine = 153 (severe undermethylation), Zn=87, Cu=90, pyrroles and metal toxics normal.

# Treatment Outcome - Mary

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- **Treatment: Methionine, Ca, Mg, Zn, B-6, Selenium, Vitamins A, C, D, E.**
- **Some improvement reported week 4. Slow gradual progress over next three months.**
- **Mary returned to mainstream classroom, more cooperative, willing to do homework, counseling continued, Vivance stopped.**

# Episodic Rage Disorder

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- **Generally good behavior with episodes of severe anger; Jekyll-Hyde behavior. Genuine remorse.**
- **Typical biochemistry: Pyrrole disorder or Cu/Zn imbalance.**
- **Treatment approach: Normalize serum Cu, plasma Zn and urine pyrroles.**

# Case History – John (Age 14)

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- **Good student, cooperative, many friends, generally calm, rage outbursts daily. Counseling, Zoloft.**
- **Cu = 189; Zn = 76; Pyrroles normal.**
- **Treatment: Gradual introduction of Zn, antioxidants, Vitamins C & E. Zoloft continued for two months.**



# Treatment Outcome - John

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- **No progress reported until week four. Gradual improvement over next two months.**
- **Rages completely stopped after 10 weeks; Counseling and Zoloft discontinued.**

# Biochemistry of Conduct Disorder

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- **Elevated urine pyrroles (65%)**
- **Cu/Zn imbalance**
- **Elevated toxic metals.**

# Case History – Brian (Age 16)

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- **Adopted son of dedicated & capable parents.**
- **At age 16: violent, destructive, truant, failing academically, counseling, Prozac.**
- **Urine pyrroles = 82 mcg/dL, plasma Zn = 65.**
- **Treatment: Zn, B-6, P5P, Biotin, Primrose Oil, Vitamins C, E.**

# Treatment Outcome - Brian

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- **Clear improvement after seven days,**
- **After two months, he became calm, ceased truancy, became an honor student & joined football team.**
- **Became a college student instead of a high school dropout.**

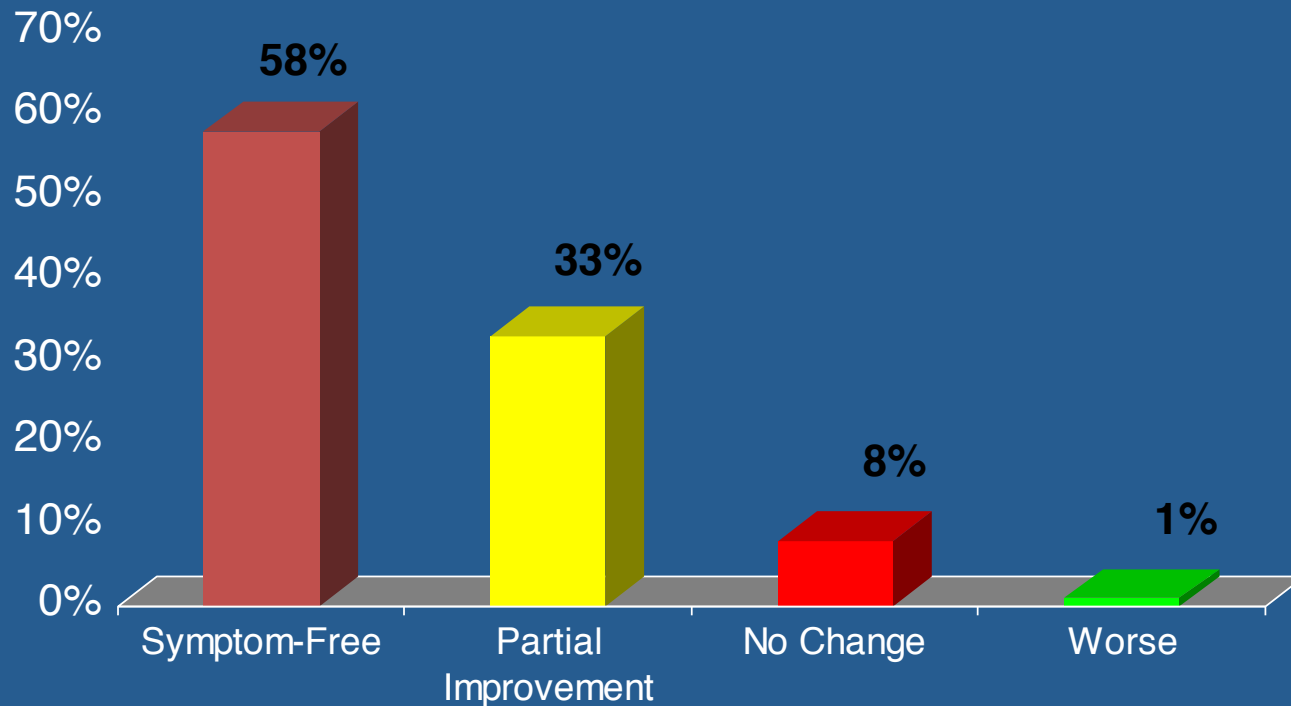
# Outcome Study

Walsh, et al. *Physiology & Behavior*, 82:835-839 (2004)

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- **207 behavior-disordered subjects**
- **Identification of biochemical imbalances and nutrient therapy to correct imbalances**
- **Frequency of physical assaults and property destruction before & after treatment**

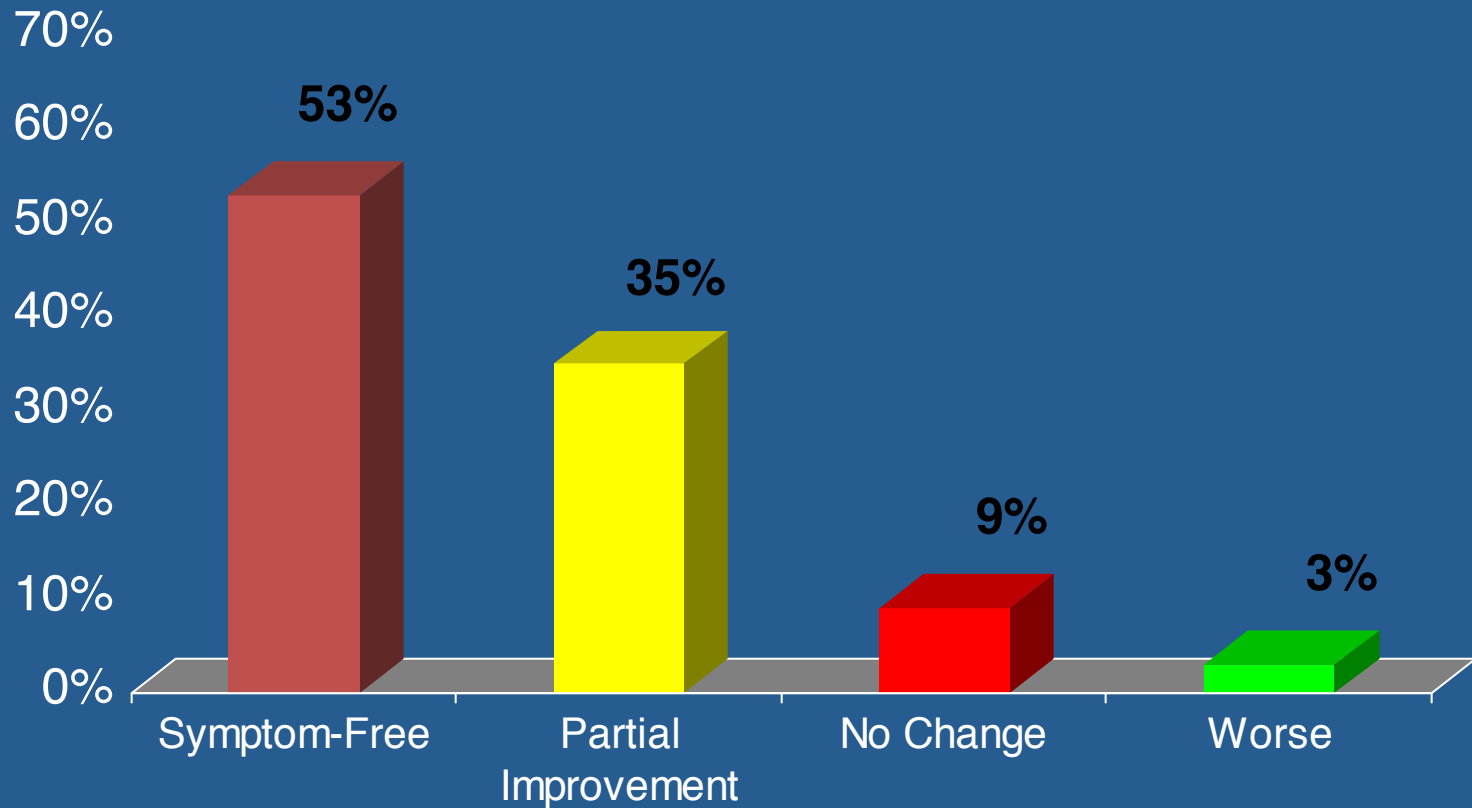
# Treatment Outcomes: Compliant Assaultive Subjects



# Treatment Outcomes

## Compliant Destructive Subjects

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# 2017 Australia Violence Study

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- **Collaboration by Griffith University and Dr. Kelly Francis.**
- **32 violent males age 4-14,**
- **Evaluation instruments: CAS, MOAS, HRQoL, PedsQL.**
- *Hambly J, Francis K, Walsh W, Haywood A, et al. (2017). Micronutrient therapy for violent and aggressive male youths: An open-label trial. J Child and Adolescent Psychopharmacology. 1-10.*



# Australia Study Results

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- **All scales indicated impressive efficacy**
- **Reduced violent behavior,  $p < 0.001$**
- **Low side-effect profile**
- **Replication of 2004 behavior study**

# ADHD Recommendations

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- **Lab Testing: metal-metabolism, pyrroles, methylation, toxic metals, etc.**
- **Nutrient therapy to normalize biochemistry.**
- **Regard drug medication as a last resort.**

Over his impressive career, Dr. Walsh has worked with 30,000 patients with conditions ranging from autism to schizophrenia to Alzheimer's. His book is an essential tool for anyone who would prefer to heal the brain with nutrients rather than drugs.

—Teri Arranga, editor-in-chief, Autism Science Digest

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AND HEAL YOUR BRAIN



WILLIAM J. WALSH, PhD

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