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Behavior and

Integrative Medicine

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The Road to
Integrative Pediatrics

Medical Training

- Medical School
  - U. of Washington School of Medicine, Seattle, WA, 1986 – 1990
- Pediatric Residency
  - Primary Children's Medical Center, Salt Lake City, UT, 1990 – 1993

Practice Experience

- General Pediatrics
  - Salt Lake City, UT, 1993 – 1999.
  - Billings, MT, 1999 - 2003
- Medical Director, Pfeiffer Treatment Center
  - Warrenville, IL, 2003 - 2010
- Integrative Pediatric Medicine
  - Gahanna, OH, 2010 - present

+ Integrative Pediatric Medicine

is healing-oriented medicine:

Patient & Family-centered care focusing on healing the whole child.

Makes use of all appropriate therapeutic approaches and evidence-based global medical modalities to **achieve optimal health and well-being** – an optimal balance of mind, body and spirit.

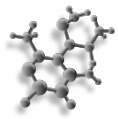
Recognizes that children strive for mastery and thereby are integral participants in their own care. Development of appropriate self-care skills are important throughout their lifetime.

Utilizes natural, less invasive interventions before more costly, invasive and potentially more risky one whenever possible.

Encourages healing partnerships between the providers, patient, and family as well as other key decision makers; thereby, supporting the **individualization of care.**

Neither rejects conventional medicine or embraces complementary alternative medicine therapies uncritically, **recognizing and differentiates many valid but different "ways of knowing."**

Culbert T and Olness K. *Integrative Pediatrics*, 2010. Oxford University Press, New York, p.4.



+ Coherent Wholeness

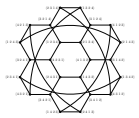
A Principal of Systems-Biology Describing The Obligatory Interconnectedness of Biology and Behavior.

"A systems-medicine model rests on the conceptualization of health and illness as part of a continuum in which all components of the human biological system interact dynamically with the environment."

"This model of practice emphasizes that chronic disease is almost always preceded by a period of declining function in one or more of the bodies organizing systems. Returning patients to health requires reversing (or substantially improving) the specific dysfunctions that have contributed to the disease state. Those dysfunctions are, for each of us, the result of lifelong interactions with our environment, our lifestyle, our belief systems, and our genetic predispositions."

More far-reaching than homeostasis, balance within a system, coherence describes an even greater order of connectedness across multiple organ systems, neuropsychology and cognition/emotion,
***i.e.* everything is connected to everything.**

Jones, DS. Needed: A Coherent Architecture For 21st-Century Clinical Practice And Medical Education. *Alt Therapies*. 2010; 16(4), pp 76-79.



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Lecture Objectives

1) Introduce the concepts to view mental wellness and illness with an integrative perspective.

2) Introduce how understanding biochemistry can help better understand the behavior and temperament.

3) Introduce the integrative model of ADHD and Autism to help better understand the biochemistry of behavior in two common problems seen in children today.

4) Introduce integrative treatment options to complement or prevent the need for pharmaceutical management.

5) Set a framework for discussion of mental wellness.

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Understanding
A Disease Process

What does it look like?

- Patient and Family's perspective
  - Clinical Manifestations
  - Level of functioning
- Professional perspective
  - Diagnostic Criteria

Incoherence among:

- Lifestyle
- Environment
- Beliefs/Behavioral expectations
- Cognition
- Emotion
- Physiology
  - Genetics and epigenetics
  - Biochemistry
  - Organ systems

Identifying Affected Systems

Systemic, Regional, or Local:

For example, in the brain is it:

- Global brain
- Individual hemisphere
- One or more foci

Organ Systems:

- Brain
- Bowel
- Immune system

General Metabolic Pathways:

- Oxidative Stress
- Inflammation
- Immune dysfunction
- Autoimmunity

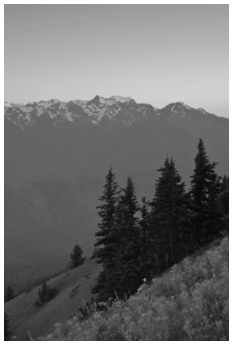
Individual Biochemical Pathways:

- Trace metal chemistry
- Methylation
- Pyrrole chemistry
- Vitamin D chemistry

An
Axial
Approach

- Axis I
  Clinical Psychiatric Disorders
- Axis II
  Personality Disorders & Mental Retardation
- Axis III
  General Medical Conditions
- Axis IV
  Psychosocial & Environmental Problems
- Axis V
  Global Assessment of Functioning

Why Mental Wellness?



Mental Wellness is the Key

- Happiness
- Physical Vitality
- Productivity
- Lifetime Fulfillment

Mental Wellness is Fragile

US National Institutes of Mental Health (NIMH):

- 55 million (25%) of adults have a diagnosable mental disorder
- 40 million (18%) of adults have an anxiety disorder
- 21 million (10%) of adults have a mood disorder
- 9 million (4%) of adults have ADHD

American Academy of Pediatrics (AAP):

- 14 million (20%) of children and adolescents have mental health problems that interfere with their ability to function on a day-to-day basis.

Mental Health Naturally by Kathi Kemper, MD, MPH, FAAP

Medication Use in ADHD

Frequency:

- 10% of 10 year old boys have received prescriptions for medications to treat ADHD
- 3 of the 5 top prescribed medications for children are ADHD medications
- Prescription of these medications has increased four-fold between 1987 and 1996.

Efficacy:

- 65% have clinical response to ADHD symptoms
- 30-50% have significant side effects (predictable adverse effects)

Mental Health Naturally by Kathi Kemper, MD, MPH, FAAP

What came first - Behavior or Biochemistry?

Brain Function is a Symphony of Electricity & Chemistry

Nerve cell firing affects connected cells:

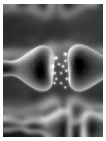
- 100 Billion nerve cells with an average of 7,000 connections per cell
- firing 300-400 times per second on average

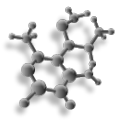
Net output depends on the balance of:

- Excitatory signals (fire)
- Inhibitory signals (don't fire)

That is communicated cell to cell by chemicals:

- No two nerve cells actually touch each other
- All cell to cell communication is accomplished by chemicals called neurotransmitters, e.g. serotonin, GABA, dopamine, and histamine





Behavior = outward result of the brain's symphony

Current Behavior = current net output

Which is the net balance of temperament plus emotion, thoughts, and other brain activity ongoing moment to moment:

- Action vs. Inaction
- Inhibition vs. Disinhibition

Temperament = long-term behavioral tendencies

- Rational vs. Irrational
- Forgiving vs. Unforgiving
- Optimistic vs. Pessimistic
- Conscientious vs. Careless
- Trusting vs. Suspicious
- Tranquil vs. Anxious

What is ADD/ADHD?

Diagnostic Criteria for ADHD - A

6 or more of the following symptoms of inattention occur often and have been present for at least 6 months to a point that is disruptive and inappropriate for developmental level:

Inattention:

- Careless mistakes or poor attention to detail in schoolwork, work, or other activities
- Sustaining attention on tasks or play activities
- Does not appear to listen when spoken to directly
- Does not follow instructions and fails to finish schoolwork, chores, or work duties
- Trouble organizing activities
- Avoids, dislikes, or doesn't want to do things requiring sustained mental effort
- Loses things needed for tasks or activities
- Easily distracted
- Forgetful in daily activities

Diagnostic Criteria for ADHD - B

6 or more of the following symptoms of hyperactivity-impulsivity occur often and have been present for at least 6 months to an extent that is disruptive and inappropriate for developmental level:

Hyperactivity:

- Fidgets with hands or feet or squirms in seat
- Gets up from seat when remaining seated is expected
- Runs or climbs when and where it is not appropriate
- Has trouble playing or enjoying leisure activities
- On the go or acts as if "driven by a motor
- Talks excessively

Impulsivity:

- Blurts out answers before questions have been finished
- Has trouble waiting one's turn
- Interrupts or intrudes on others

Adding up the Diagnostic Criteria for ADHD

- Some of the pathologic symptoms were present before age 7 years
- Some impairment of the symptoms is present in 2 or more setting – school, work, home or mall
- Clear evidence of significant impairment in social, school or work functioning

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ADHD, *Combined type* = both A and B

ADHD, *Inattentive type* = A without B

ADHD, *Hyperactive-Impulsive type* = B without A

Attention Deficit or Deficit of Net Attention?

Integrative medicine attempts to determine what is leading to a deficit of net attention. Someone may start with adequate attention; however, may have one or more problems that steal brain function resulting in a decrease of net attention:

1. Hyperacousis (Pyrrole Disorder)
2. Poor memory (Zinc Deficiency)
3. Poor energy (Hypoglycemia)
4. Agitation (High Copper)
5. Somnolence (Sleep Apnea)
6. Histamine symptoms (Allergies)
7. Emotional Stress
8. Learning differences
9. Processing problems

What is Autism?

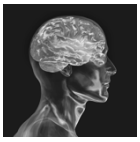
An Integrative Pediatrics Description of ASD

ASD is a <u>medical illness</u> with:

1. a biological impaired brain
2. multi-organ system involvement and thereby multiple medical problems
3. genetic and acquired factors

Resulting in abnormal behavior, learning and development that is:

<u>treatable.</u>



Preponderance of Autisms

- Social Interaction
  - poor eye contact
  - inability to regulate social interaction
  - inability to develop age appropriate relationships
- Language
  - delay or lack of spoken language
  - abnormal or absence of imitative play
- Symbolic or Imaginative Play
  - rituals
  - repetitive mannerisms (aka "stims")
  - restricted areas of interest

An Integrative Approach to Mental Wellness

Systems Biology Approach

- Gastrointestinal
- Neurologic
- Immune
- Autoimmune
- Metabolic and Endocrine
- Biochemical
- Psycho-neuro-endo-immune

Biochemical Individuality and Behavior

The basis for Targeted Nutrient Therapy

Nutrients and Neurotransmission

The Brain is a Chemical Factory

Provided with all necessary precursors and co-factors the brain can manufacture all it needs. The source of these building blocks is dietary:

- Zinc is required for GABA synthesis
- Vitamin B6 is required for Serotonin (5-HT) synthesis
- Copper (Cu^{++}) is a cofactor in the conversion of Dopamine (DA) to Norepinephrine (NE).
- The methyl:folate ratio impacts the levels of Dopamine, Norepinephrine and Serotonin.

Biochemical Individuality Matters

Individuality

Due to genetic and epigenetic influences individuals may be:

- *Deficient* in several nutrients, as well as
- *Overloaded* in others.

Multi-vitamins are rarely effective, as they may:

- Contribute to nutrient excess in pre-existing overload states (i.e. copper, folate) and/or
- Induce another nutrient imbalance.

Targeted Nutrient Therapy

Treatment focuses on correcting specific imbalances that manifest with specific and consistent clinical symptoms.

- Genetic nutrient deficiencies may require many times the RDA to achieve normalization/ optimization.
- Genetic overloads may require nutrient/biochemical therapy to eliminate the nutrient excess.

Violent Behavior Outcome Study

Walsh WJ *et al.* Reduced violent behavior following biochemical therapy. *Physiol Behav.* 2004 Oct 15;82(5):835-9.

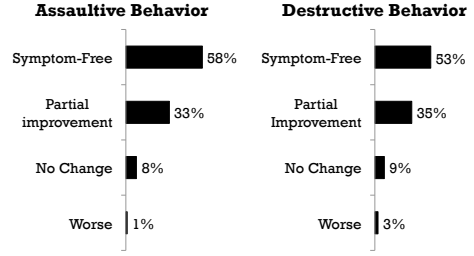
Study Details:

- 207 behavior-disordered subjects
- Diagnosis of biochemical imbalances
- Targeted nutrient therapy to correct imbalances
- Measurement of frequency of physical assaults and property destruction before and after treatment

Study Compliance:

- 12% failed to initiate treatment
- 11% were non-compliant with treatment
- 77% achieved compliance throughout the study period

Response to Targeted Nutrient Therapy



Differential Diagnosis of Biochemistry

- Oxidative Stress
  - Inflammation
  - Mitochondrial Dysfunction
- Disordered Trace Mineral Chemistry
  - Zinc Deficiency
  - Copper Excess
- Pyrrole Disorder
- Disordered Histamine Chemistry
- Vitamin D Deficiency
- Iodine Deficiency
- Magnesium Deficiency
- Functional Hypoglycemia

Zinc Deficiency

Clinical Features:	Metabolic Consequences:
■ Explosive temper	■ Reduced defense against oxidative stress
■ Mental lethargy & poor memory	■ Decreased GABA formation
■ Poor & delayed growth	■ Altered copper homeostasis
■ Frequent infections	■ Impaired cell-mediated immunity
■ Poor wound healing	■ Poor energetics
■ Acne	
■ Hypoguesia	
■ White spots on fingernails	

Copper Excess

Clinical Features:	Metabolic Consequences:
■ Hyperactivity	■ Increased oxidative stress
■ Temper tantrums	■ Increased inflammatory responses and stressors
■ Learning problems	■ Increased Norepinephrine effects due to increased conversion from Dopamine
■ Agitation	■ Increased strain on zinc requirements
■ Tinnitus	
■ Depression (dysthymic or refractory)	
■ Post-partum Depression	

Pyrrole Disorder

Clinical Features:	Metabolic Consequences:
■ Fear and anxiety	■ Increased oxidative stress
■ Mood swings	■ Functional Vitamin B6 deficiency
■ Stress intolerance (emotional, biochemical, & physical)	■ Impaired serotonin synthesis
■ Misperceptions	■ Zinc deficiency
■ Sensory issues (light, sound, & tactile)	■ Low blood arachindonic acid levels
■ Increased risk of PTSD-related triggers	■ Physiologic stress (i.e. adrenal fatigue)

Low Blood Histamine

Clinical Features:	Metabolic Consequences:
■ Generalized anxiety	■ Relative folate deficiency
■ Depression	■ Tendency to high dopamine, serotonin and norepinephrine
■ Panic	■ AKA "over-methylation;" however, metabolic consequences are not most accurately so simply described.
■ Agitation & paranoia	■ Higher risk of negative effects from SSRIs and medications with anti-histaminic effects.
■ Racing thoughts	
■ Underachievement	
■ Good response to benzodiazepine medication	

Elevated Blood Histamine

Clinical Features:	Metabolic Consequences:
■ ADHD	■ Methyl deficiency
■ OCD, perfectionism	■ Clinically associated with low levels of dopamine and serotonin
■ Blank-mind	■ AKA "undermethylation"
■ Rumination	■ Typically good response to SSRI medications
■ Addictive behavior	■ Higher risk of negative effects with moderate or higher doses of folic acid
■ Migraine headaches	
■ Seasonal allergies	

Cases

Case #1

CC: 5 year old male with rage, violence and homicidal threats against younger brother

HPI: Abrupt change in behavior 4 months prior to behavior w/o apparent trigger. Fears that parent were trying to poison him. Tantrums 10-20 times daily, including threats to kill someone – most commonly his younger brother. Destructive and assaultive behavior.

PMH: NSVD w/ true knot in the cord. Breastfed for 8 months. Hx of colic & 2-3 ear infections. Speech delay resolved with Speech Therapy.

FH: No history of psychiatric illness in the family.

Test: Normal EEG. Normal CT. Normal genetic and metabolic work-up.

Case #1

"if he were an adult, he would be in a straight jacket to restrain him"

Additional history:

Jeckyl-Hyde behavior with clear intolerance to hunger. Stress intolerance, especially with demands in behavior. Interestingly, no light, smell or tactile sensitivities.

Key clinical features:

- Mood swings/instability
- Anger and rages
- Fear and paranoia
- Intolerance to stress
  - Hunger
  - Behavioral modification

Laboratory assessment:

- Copper: normal
- Zinc: very low
- Pyrrole: elevated

Biochemical Diagnoses:

- Pyrrole Disorder
- Zinc deficiency
- Hypoglycemia (functional)

Case #1 Outcome

After one year:

- Rage-free for 6 months
- Smaller tantrums without verbal or physical aggression toward others
- No homicidal threats
- Defiance reduced

After two years:

- Happier and more pleasant
- Behavior much improved with rare outbursts
- Stress tolerance improved, though prolonged fasting still problematic
- No problems in school with out need for IEP or 504 Plan.

Case #2

CC: 17 year old female with anxiety, suicidal depression and volatile anger

HPI: Continues with suicidal gestures (pill ingestion and cutting) despite treatment with Effexor 150mg and Trazadone 50mg daily. ODD symptoms, anxiety and panic all becoming worse.

PMH: NSVD w/o complication. Adopted at 4 months. Recurrent ear infections with 2 sets of PETs. Complex Migraines. Sexual abuse by father. Depression starting age 12 years at father's death.

Care: Psychotherapy. Psychiatry.

Dx: 1) Major Depressive Disorder; 2) Generalized Anxiety Disorder
3) Oppositional Defiant Disorder; 4) Post traumatic stress Disorder

Case #2

Additional history:

Inhalant allergies. Irritability with even brief fasting. Sensitivities to light, odor and certain tactile stimuli. Internal tension with ritualistic behavior. Significant fears, anxiety and paranoia.

Key clinical features:

- Fear and anxiety
- Sensory issues
- Agitation/ Temper Tantrums
- Depression
- Rituals
- Seasonal allergies
- Migraine headaches

Laboratory assessment:

- Copper: very elevated
- Zinc: low
- Pyrrole: elevated
- Histamine: elevated

Biochemical Diagnoses:

- Pyrrole Disorder
- Zinc deficiency
- High Histamine
- Hypoglycemia (functional)

Case #2 Outcome

After 2 months on preliminary treatment, the patient's mother sent an email update:

Subject: Happy days are here again

She back to her old self again! The paranoia has completely disappeared, and she is back to being the sweetie pie she always was!

After 6 months the patient stopped vitamins and medications (against recommendations to the contrary):

- within four weeks had relapsed with increased anxiety and was refusing medication
- three weeks later on the targeted nutrient program she had almost completely recovered from relapse

Case #3

CC: 17 year old male with newly diagnosed seizures presenting with distractibility, inattention, fatigue and school failure.

HPI: Significant sedation and increased irritability with Tegretol. Failing in school due to forgetfulness and ADD. No alcohol or drug use.

PMH: Seizures – temporal and occipital. Leaning disability with dyslexia. Seasonal allergies. Headache NOS.

FH: Depression, heart disease, cancer and hypertension in the family. No family history of seizures or psychiatric illness.

Dx: 1) Seizure Disorder. 2) ADD. 3) Learning Disability. 4) School Failure

Case #3

Additional history:

Typically a very even tempered kid, well-liked with good friendships. Very poor short term memory. Some perfectionism. Ruminates and obsessive thoughts. Artistic.

Key clinical features:

- Very poor short term memory
- Obsessive thoughts
- Socially-oriented
- Artistic
- Underachievement

Laboratory assessment:

- Copper: normal
- Zinc: very low
- Pyrrole: normal
- Histamine: low

Biochemical Diagnoses:

- Zinc deficiency
- Pyrrole Disorder, added at one year follow-up visit
- Low Histamine, added at the three year follow-up visit

Case #3 Outcome

After 6 months:

- Significant improvements in reading, ADD, and negative obsessions
- PCP discontinued Tegretol

After 2 years:

- Gains maintained
- Anger emerged and was effectively treated as Pyrrole Disorder

After 3 years:

- Depression, distractibility, and inattention became problematic and were unresponsive to medication
- Addition of low histamine treatment improved attention, focus and mood.

After 11 years:

- Successful business owner doing "fantastic"
- Feels his successes in school and life were due to the addition of his nutrient program

Mental Wellness requires a commitment and action

Choose Mental Wellness

<u>Practice Self Love</u>

Each one of us deserves our own best effort in achieving physical, mental and spiritual wellness

- AND -

We need to treat ourselves with compassion and kindness – mistakes are inevitable in the human journey.

Much of a child's habits are learned along the way by imitation; therefore,

Parents who want to help their child, must first help themselves.

Focus on the Fundamentals

Rest and Exercise:

- 45-60 minutes of moderate to vigorous physical activity daily
  - Outside when possible
  - Functional and fun activities
- 8-10 hours nightly of restful sleep
  - Consistent wake time
  - Consistent bedtime routine
  - Turn off electronics hours before bed

Nutrition:

- Eat high-quality fuel - fruits, vegetables, whole grains, nuts, beans and fish
- Choose organic, whole food
- Drink pure water
- Eliminate caffeine
- Eliminate food colorings, preservatives, artificial sweeteners, nitrates,

Focus on the Fundamentals

Environment:

- Sunshine and nature
- Music or nature sounds
- Stress-minimized
- Limit electronics to <1 hour daily
- Absolutely no TV in the bedroom
- Avoid noise, clutter, heavy metals and toxic chemicals

Fellowship:

- We are social beings with a need for strong friendships
  - Take the time to reconnect
  - Take time for charity
- Mental Wellness is contagious
- Mental Wellness confers resilience to unhealthy thoughts, especially in the company of friends

Build your team

- Parents
  - Support groups
- Educators
  - IEP team
  - Tutors
- Community
  - Sports
  - Walk with a Doc
- Professionals
  - Spiritual guidance
  - Mental & behavioral health
  - PT, OT, and Speech therapy
  - Integrative medicine
  - Massage/ Cranial Work
  - Bio- / Neuro- feedback

The Role of Integrative Medicine

Goals of Treatment

- Identification of broken systems
  - Systemic, regional, and/or local
  - Organ systems
  - Metabolic and/or biochemical
  - Mind, body, and spirit
- Restoration of normal function
- Protection of re-injury
- Promotion of normal physical, emotional, and mental health
- Restoration of more normal learning and development

Rule out Co-morbidities

Learning Differences

Sensory Integration Disorders:

- Auditory processing
- Visual processing
- Motor planning difficulties

Sleep problems

- Sleep apnea
- Sleep phase disorder

Anxiety disorders

Mood disorders

Behavior disorders

- Oppositional Defiant Disorders

Overview of Treatment

- Dietary Intervention
  - Ensure optimal nutrition
- Normalization of bowel function
  - Ensure regular, effective stooling
  - Treat dysbiosis, if present
- Correct biochemical imbalances and oxidative stress
- Maximize learning by helping anxiety, sensory problems, focus, attention, inattentive and attention avoidance factors:
  - Nutrients (i.e. methyl B-12)
  - Indicated pharmaceuticals
- Expect new insights along the way

Digestive Wellness

Dietary Intervention
- Ensure optimal nutrition
- Elimination Diet
  - Gluten, casein, soy, and/or corn
  - Other allergens
- Essential Fats
- Toxin elimination

Normalization of bowel function
- Ensure regular, effective stooling
- Maximize breakdown of food mass
- Restore a healthy bowel environment

Correct biochemical imbalances and oxidative stress
- Zinc deficiency
- Stress reduction
- Exercise

Care for your colon

Ensure Proper Elimination
- Plenty of fresh, pure water
- Natural fiber
- Exercise

Reduce GI Insults
- Chew thoroughly
- Digestive enzymes
- Minimize exposure to allergens, irritants & chemicals
- If celiac +, then NO gluten

Nourish The Bowel
- Eat organic, local & fresh
- Whole food for phytonutrients
- Sensible use of fat soluble Vitamins (A, D, E, K), zinc, iron, B9 & B12, & maybe copper

Foster Beneficial Microbes
- Eat organic, local & fresh
- Live foods
- Probiotics
- Natural fiber

Health Begins at the Dinner Table

Nourishing Food
- Organic, whole foods
- Consciously prepared

Family Time and Fellowship
- Relationship building
- Consciously enjoyed (i.e. slow down)

Life Skills Building
- Emotionally grounding
- Family building and role model development

Resources

Environment:
EWG.org

Food:
Feingold.org
ChooseMyPlate.gov

Books:
Mental Health, Naturally by Kathi Kemper
Healing ADD: The Breakthrough Program That Allows You to See and Heal the 6 Types of ADD by Daniel Amen
Driven to Distraction: Recognizing and Coping with ADD from Childhood Through Adulthood by Edward M. Hallowell, MD and John J. Ratey, MD
Transforming the Difficult Child: The Nurtured Heart Approach by Howard Glasser and Jennifer Easley

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