

Pills + Skills = Success

Brain-based Psychopharmacology
for Children & Adolescents
with Challenging Behaviors:
Focus on Trauma & Foster Care

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What am I doing here?

To help you understand medication use

- Introduction: Overuse of Meds in FC...Why???
- Brief review of brain-behavior connection (re: meds)
- Outline basic assessment for potential use of psychotropic medication / Overview of new protocol
- Discuss specifics of brain-behavior med Tx in kids
 - Including my new proposed medication algorithm!
- Discuss non-medical professional's role re psychotropic med prescribing / monitoring / collaborating

Too Many *Psychotropic* Meds! Another National Crisis in Foster Care:

- Not a new problem (Ask Hillary)
- Seen across the land (Pivotal study: Nov 2011)
- We have seen it for 12 years at WMU CTAC...
 - "My name is Amanda (age 5 yrs) and I'm bipolar"...and schizo-something"...
- Lansing responds ...(to the Decree!)...
 - Enter the "Foster Care Drug Czar"
 - Good intentions...grim realities

WHY...
are there too many meds???

- Not enough **Child/Adolescent** Psychiatrists
- Not enough Brain-Behavior thinking in general
- Not enough clinical medication research for traumatized kids in foster care / adoptive care
- No clinical/medication algorithms that are FASD-/trauma-informed (...yet!)
- Not enough "med-savvy" PC providers
- Too much DSM-IV!!! (or DSM-V!)

How do we reduce med use???
Hint: It not easy/simple!!! (It never is)

- The answer spreads way beyond medication issues...
- ...But...medication issues are a critical piece of the answer
- Acceptance and integration of the Brain-Behavior paradigm for **all** stakeholders
- **Total Systems Integration**

Overarching Brain-Behavior Goal:
Total Systems Integration

- Individual child (integrated brain function)
- Committed caregivers (integrated family function)
- Individual professionals (vertical integration)
- Individual "silos" (vertical integration)
- Creative collaboration / effective implementation between "silos" (horizontal integration)

TSI: Vertical Systems Integration:

Taking care of yourself and your team

- Each "silo" must have **optimized function**
- Each silo member must be well trained
 - Training / professional development issues
 - Secondary trauma issues are **critical**
- Again...the **brain** must be the common language that links in all directions
- Vertical integration promotes horizontal integration

TSI: Horizontal Systems Integration:

Seamless & Creative Collaboration

- All (system) silos unite!
- The key word is **transdisciplinary**
- No specific hierarchy / Check ego at the door!
- Involves assessment & treatment/management
- Ongoing communication between systems
- **Brain** is the common language to accomplish
- Must use Trauma-/FASD-informed brain model
- Child must remain in the center

Brain-based medication use:

Key piece of this **TSI** model

- Need a well-defined role for medications in Foster / Kinship / Adoptive Care children
- Gather a sufficient evidence-base to support theoretical FASD-/ trauma-informed brain-behavior principles:
 - Evidence-based prescribing
- Testing / refining clinical medication algorithms in the primary care "trenches"
 - **Prescribing-based evidence!**

WMU BRAIN Lab

Brain Research & Interdisciplinary Neurosciences

- A vision becomes a recent reality!
- Transdisciplinary Model:
 - Occupational Therapy --Speech/Language
 - Music Therapy --Nursing
 - Psychology --Medicine
- Collecting physiological evidence while children perform battery of tests / tasks (in lab & remotely)
- Collaboration with MI neuroimaging centers
- Medication research is being planned

Individual Outcomes in JJ CTAC 2011 OJJDP research grant

- 5 county (MI) sample – multi-system training via CTAC SAMHSA grant
- Impact of trauma-informed system on individual outcomes in JJ
- 1 county subsample: impact of executive function on JJ individual outcomes
- Next grant?: Brain-based meds – impact on JJ individual outcomes

Let's get back to the brain!!

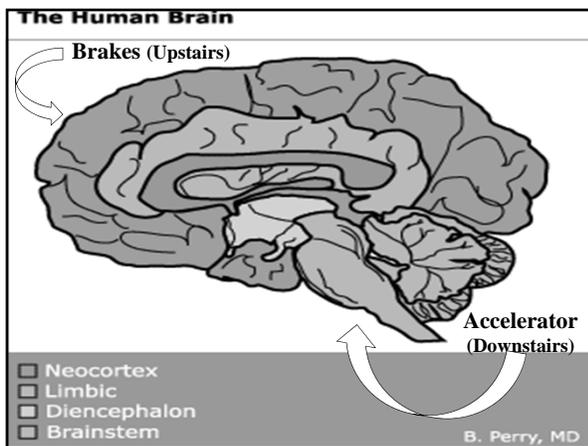
Because the brain is clearly the ***common language*** needed to enhance communication / facilitate creative collaboration between all parties and...
we need it for "***brain-based meds***"

Thinking about the brain: A 3-D Jigsaw Puzzle

- Upstairs vs Downstairs
- Back meets front
- Left meets Right

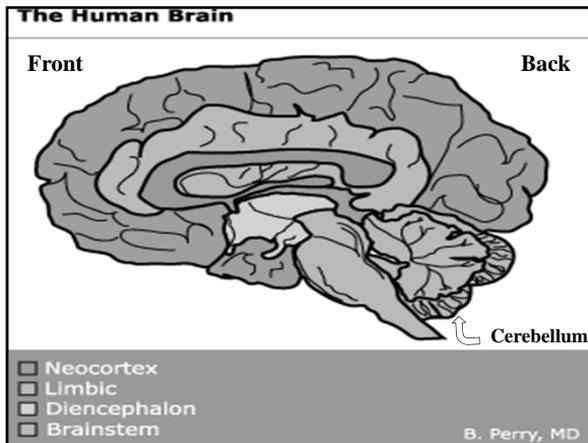
Upstairs vs Downstairs

- **Top** (Pre-frontal cortex) vs **Bottom** (brain stem)
- **Brakes** vs **Accelerator** (much more later...)



Back meets Front

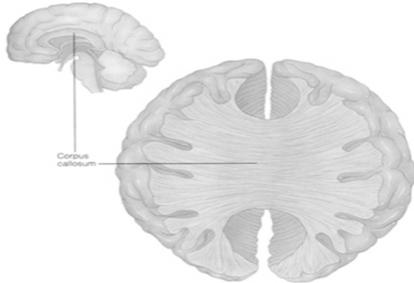
- **Perceive** (sensory system) then **act** (motor system) then **think** (cognitive system)
- **Cerebellum**: (“white-hot” in behavioral neuroscience) is central “player” for all sensory, behavioral and cognitive function
- Cerebellar connections to PFC / subcortical areas have major impact on complex regulation



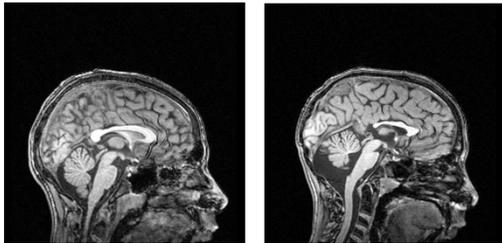
Hemispheric Integration Left meets Right

- Connecting language / logic with emotion
- Key to emotional processing / regulation
- Corpus Callosum: major structure (linking the left and right hemispheres) that is not well understood by most clinicians
- Final step of effective **complex regulation**

Corpus Callosum: Connecting Left with Right



Corpus Callosum abnormalities in Fetal Alcohol Syndrome *(12 year old male subjects)*

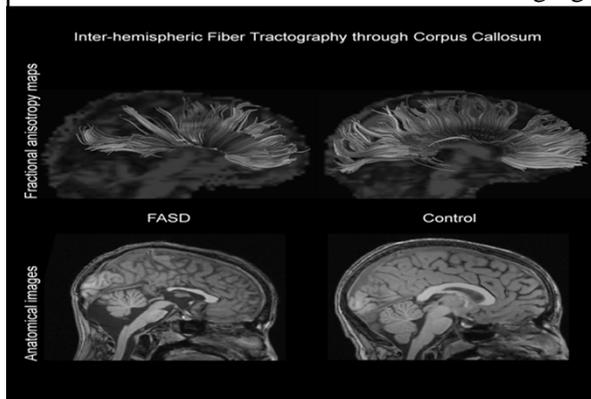


Normal Development

Fetal Alcohol Syndrome

20

Star Trek Medicine: Diffusion Tensor Imaging



Complex Regulation meets Total Brain Integration

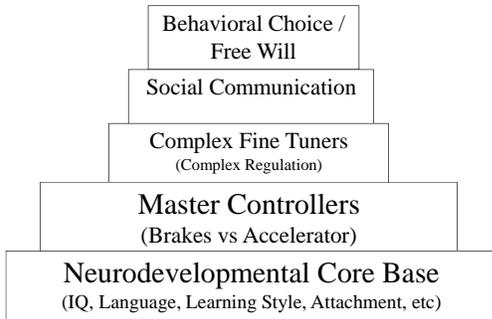
- When all these brain pathways are synchronized, you have complex regulation:
 - Arousal regulation (brain energy balance)
 - Behavioral regulation (most clinically obvious / traction-inducing)
 - Emotional regulation (last but not least!)
- When complex regulation persists, you begin to see brain integration
- Integration = permanent brain changes (neuroplasticity)

The Whole Brain Child... by Daniel Siegel, MD (2011)

- Newest book by this unique thought leader
- Helps parents / caregivers / professional staff understand how the brain works
- Helps explain complex concepts like integration
- Many practical strategies for helping children and adults achieve CNS integration
- My \$0.02: traumatized / FASD kids often need **optimized medication** to achieve CNS integration

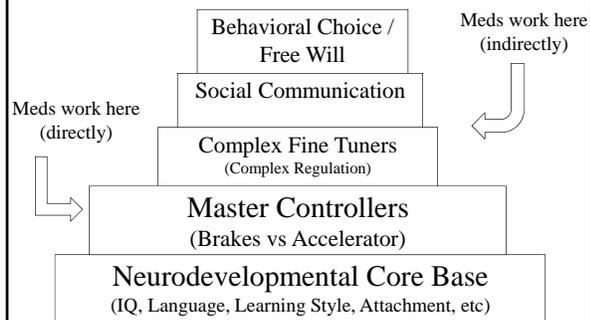
So...how & where do meds fit???

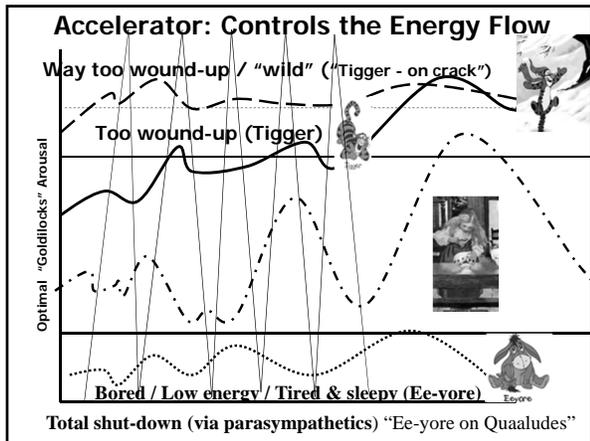
Brain – Behavior Functional Model:
Building integration one level at a time





Brain – Behavior Functional Model:
Building integration one level at a time





Remote Control of the Accelerator

The Confusing Picture of Anxiety

Fight-Flight-Freeze in the JJ / CMH / DHS system

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- Anxiety / Panic as source for reactive anger → aggression
- Anxiety – Attention – Language interplay in kids/teens w/ aggression
- False machismo in anxious teen boys

Anger / Explosiveness:

Critical Link to Reactive Aggression

- Many faces of anger
- Anger as coping skill
- ("Just" anger as clinical progress!)
- Aggression = Anger **plus** "bad" brakes →→

So..., let's talk about the...



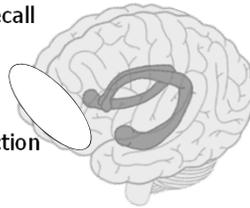
BRAKES

The Prefrontal Cortex: The home of Executive Function

Executive Function:

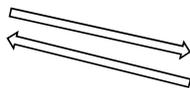
The *"brakes"* of the brain

- Working memory / memory recall
- Focusing (locking, shifting & sustaining)
- Planning / organizing
- Self-monitoring of behavior/action
 - Impulse control
 - Key role in interoception
- Major role in **Regulation** →→→



Delicate Balance of Regulation: Coarse control of emotion / behavior

Top-Down *"Brakes"* (Prefrontal Cortex)



Bottom-Up *"Accelerator"* (Brainstem/Limbic System)

Executive Function:
Essential role in **complex regulation** of:

- Attention / Arousal / Brain Energy
- Behavior / Action
- Mood / Emotion

Don't Forget About the Steering

- Conscious control of behavior
- Importance of **tight structure** for optimal behavior management
- Willfulness misconceptions
 - It's not **all** willful!
 - But some **is** willful!
 - And some **looks** willful!
 - Behavioral "curve balls" in homes, schools, detention...



Final Thoughts: Regulation / Willfulness: Power Steering vs Manual Steering

- **Regulated** steering = **power** steering!
 - Easier to make appropriate motor / behavioral / emotional decisions while regulated
- **Dysregulated** steering = **manual** steering
 - Tougher to keep the behavioral "car" on the road

Searching for Goldilocks

When regulation turns into *integration*

Optimal Mood / Arousal Regulation =

Optimal Learning, Behavior, Attention, Memory

Primer for Psychotropic Medications

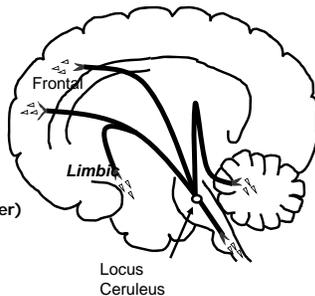
• How do psychotropic drugs work???

- Blood-brain barrier
- Neurotransmitters
 - Dopamine
 - Norepinephrine
 - Serotonin
 - GABA
 - Many others!!!

Norepinephrine Neurotransmission

Norepinephrine

- Wide CNS distribution
- Neuromodulator (fine tuner)

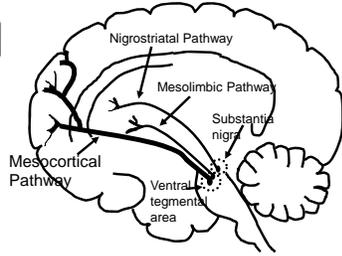


Solanto. *Stimulant Drugs and ADHD*. Oxford; 2001

Dopamine Neurotransmission

Dopamine

- Extensive CNS distribution
- Neuromodulator (fine-tuner)

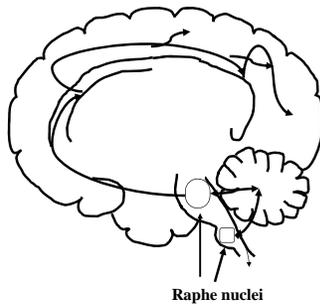


Solanto. *Stimulant Drugs and ADHD*. Oxford; 2001

Serotonin Neurotransmission

Serotonin

- Extensive CNS distribution
- Neuromodulator (fine tuner)



So...what does all of this have to do with challenging kids and meds???

...So sorry... but there's just one more major concept before we get to the med specifics!!

The Brain-Behavior connection:
Welcome to the world of child development
3 major & intertwined components

- **Genetics / Epigenetics**
 - What you inherit from both parents
- **Intrauterine environment**
 - During pregnancy
- **Extrauterine environment**
 - After pregnancy

The Brain-Behavior Connection

- **Genetics / Epigenetics**
 - Neurodevelopmental strengths / weaknesses
 - Temperament / Personality
 - Family history of:
 - Attentional disorders
 - Learning disorders
 - Mood disorders
 - Neuropsychiatric disorders

The Brain-Behavior Connection

- **Intrauterine environment**
 - Exposure to drugs (legal / illegal)
 - Exposure to alcohol
 - Maternal stress
 - Maternal nutrition

The Brain-Behavior Connection

- **Extrauterine environment**

- Parental attachment / nurturing
- Parental style / psychopathology / M-F parenting style differences
- Family system style / family activity levels & expectations
- Nutritional status
- Exposure to violence, natural disasters
- Exposure to neglect
- Exposure to abuse (verbal / emotional / physical / sexual)

Psychotropic Medication Assessment

Psychotropic Med Assessment

- **Why do creative assessment?**

- Logical “first step” to **effective prescribing** of psychotropic medications
- Avoids heavy /sole reliance on DSM-IV model in traumatized / FASD kids
- Need for a brain-based reliable, reproducible (& defensible) **comprehensive** assessment process
- Creative **collaboration** between MH / JJ / school staff and PCP/psychiatry is essential (but not always easily doable / evident)

Psychotropic Med Assessment in Juvenile Justice

• General Principles of Assessment

- **History:** enhanced by data gathering p/t doc visit
- **Physical Exam:** must not forget to r/o organic etiologies of behavioral / psych symptoms
- **Laboratory / Imaging:** No routine studies, etc.
- **Mental Status Exam:** often underutilized (& underappreciated) by PCP
- **Rating Scales:** invaluable aid to effective Dx / Tx
- **Computerized assessment:** (TEC, ADHD *Quotient*)

Psychopharmacologic Treatment in Challenging Children / Adolescents

Multimodal Treatment:

Meds alone are never enough! (more later!)

- Accurate diagnosis as 1st step of treatment
- Classroom accommodations
- Bypass strategies / interventions (home/school)
- Demystification / psychoeducation
- Psychotherapies
- Occupational Therapy (SPD)
- Physiological therapies (more later)
- Mentoring / Tutoring / Coaching
- **Psychotropic Medication**

Changing Landscape of Psychotropic Medication

- Since 2000, many new medications have been introduced
- It is difficult for primary care physicians to keep pace with new meds
- Especially tough for JJ/MH/CW professionals to get **useful** information on medication
- New choices = new treatment opportunities
- These are exciting times!!

Psychopharmacologic Treatment

- Psychopharmacology as part of multi-modal Tx
- Critical questions:
 - **When** to do meds!
 - **Which med** to do first?
- Adequate follow-up essential (the details matter!)
- For optimal medication treatment:
 - Need effective **collaboration / communication**
 - With parents / teachers / MH professionals / other supervisory adults (tutors / coaches / case managers / direct care staff / OT's / SLP's)

Psychopharmacologic Treatment

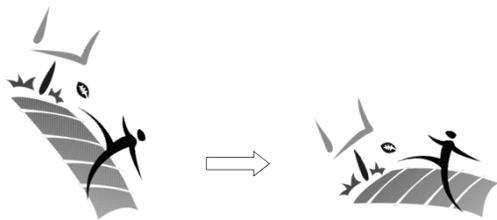
- **Important points in using medications:**
 - Target Symptoms vs DSM-IV Diagnoses
 - “Deconstructing the DSM”
 - **Brain-based** meds (stay tuned!)
 - Impairment of function requirement:
 - **Starting** medications
 - Changing medication **doses**
 - Changing **type** of medication

Psychopharmacologic Treatment

Important points in using medications:

- Emphasize that the **GOAL** of med Tx is to *restore normal (as possible) brain function*
- Remember the **"COMFORT ZONE"**
- Optimal med Tx allows other treatment modalities (CBT, OT, DBT) to be more effective
- Impact of substance use / abuse in teens

Remember, its all about...



Leveling the playing field !!!

Specifics of optimized
brain-based
medication treatment

Optimized Brain-based Medication Treatment

- Major target area:
Brakes:
 - Focus / concentration
 - Arousal dysregulation
 - Executive dysfunction
 - Working memory
 - Impulse control
 - Hyperactivity
 - Mood dysregulation
- Major target area:
Accelerator:
 - Sleep / arousal
 - Limbic irritability
 - Anger / explosiveness
 - Mood lability
 - Callosal dysfunction
 - Anxiety / OCD
 - Panic / Fight-Flight
 - Depression

Psychotropic Medication

Proposed Algorithm (Sloane 2011)

Key Clinical Questions:

- 1) Sleep Issues? Y or N
- 2) Severe Mood Issues ? Y or N
- 3) Executive Function Issues? Y or N
 - a) Impulse Control
 - b) Regulation

(Focus on 24/7 optimization of regulation) →→

Psychotropic Medication Proposed Algorithm

- When regulation is optimized, is there:

- 4) Low motivation / low arousal? Y or N
- 5) ↓ focus / attention? Y or N
- 6) Depression? / Anxiety? Y or N

Psychotropic Medication Proposed Algorithm

- Are medications now optimized? Y or N
- Is the playing field now level? Y or N
- If not, use other physiologic treatments:
 - Sensory-focused occupational therapy
 - Exercise / Complex Movement (Zero-hour PE, Yoga, Tai Chi, **SMART** program at Boston U)
 - Optimized nutrition (more protein, less processed food) – Nutritional Neuroscience advances
 - Expressive Therapies (**Music**, Art, Dance)

Personal Reflections: Impact of utilizing new med paradigm

- Decrease of new antipsychotic Rx
- Decrease of new stimulant Rx
- Increase of new non-stimulant ADHD med Rx
 - Strattera, Intuniv, Kapvay
- Increase of low-dose SSRI Rx
 - Citalopram (Celexa), escitalopram (Lexapro), sertraline (Zoloft)

Spark by John Ratey, MD

- Excellent book about the positive and essential impact of physical exercise on neuroplasticity
 - Via Brain-Derived Neurotrophic Factor (BDNF), et al (“Miracle Grow” for the brain)
 - 30 minutes of daily aerobic exercise followed by 30 minutes of complex movement (*Brain Gym*, dance, basketball, gymnastics, martial arts, yoga, etc)
 - Local / national school experience
 - Implications for all ages (children, adolescents, woman’s health, Alzheimer “prevention”)

A truly level playing field allows other treatment modalities to be more effective

- Psychotherapies
- Case management
- Wraparound protocols / Intensive Home Tx
- Behavioral management
- Social skills training
- Parent training
- Respite services
- MST
- Tutoring / Coaching / Mentoring

Medication Use in Foster Care Vertical / Horizontal Integration

- Creative and ongoing collaboration is essential
- Data sharing re medication is needed
- When all silos are "in synch", med use is much more efficient
- Allows faster / more efficient pathway to optimized medication regimens / doses
- Results in fewer medication side effects

Beyond Medication: The Time to Act is NOW!

- Local, regional, state, & national efforts are needed to encourage vertical / horizontal integration to help CW kids
- "Tipping Point" moment in child welfare
- We are truly all in this rowboat together!
- If we work together...we will keep it afloat!
