


## The Neurofeedback Approach to Attention Deficit Hyperactivity Disorder

### Steve Kapusta, Owner - BrainTraining of Hampton Roads, Inc.

- Originally from Pittsburgh, PA; resident of VA Beach for 4 years
- Graduate of Clarion University of Pennsylvania
- Entrepreneur for more than 25 years
- Owner of BrainTraining of Hampton Roads
- Received Advanced Certification for QEEG and Neurofeedback from BrainCore Systems
- Since BTHR's inception in 2015, have helped many individuals with their symptomatology from ADHD, Anxiety, Depression, Fibromyalgia and other conditions
- Objective - to help people 'regain their lives' with this incredible non-invasive, drugless and painless technology



[www.braintrainingofhamptonroads.com](http://www.braintrainingofhamptonroads.com)



## What is Neurofeedback?

A technique, for dealing with brain-based disorders without the use of medication or invasive procedures, in which brain activity is recorded using sensors and presented visually or audibly so that the patient can know the state of the function he or she is trying to control.

A 'new' and not so 'new' technology!

## What conditions can be helped by Neurofeedback?

Over 40 years of peer reviewed, university based research has demonstrated the efficacy of neurofeedback in addressing many neurological conditions

|                           |                            |                      |
|---------------------------|----------------------------|----------------------|
| <b>ADHD</b>               | <b>Anxiety</b>             | <b>Panic Attacks</b> |
| <b>Insomnia</b>           | <b>Chronic Pain</b>        | <b>Bedwetting</b>    |
| <b>Migraine</b>           | <b>Fibromyalgia</b>        | <b>TBI</b>           |
| <b>Tension Headache</b>   | <b>PTSD</b>                | <b>Depression</b>    |
| <b>Learning Disorders</b> | <b>Autism / Asperger's</b> | <b>Tics</b>          |

As well as other conditions

## How Can One Technology Effect So Many Different Conditions?

Each of these conditions has one thing in common:

They all are associated with dysregulated (abnormal) **brainwave patterns**.

Neurofeedback is designed to correct dysregulated brainwave patterns



## Prevalence of ADHD

- The National Institute of Mental Health (NIMH) estimates that **5 million children** in the United States have ADHD - that is about 5% of all children!
- The rate of children diagnosed with ADHD has increased more than 50% in the past decade.
- Studies show that up to 70% of children with ADHD continue to have symptoms as adults - that translates to 4% of the US adult population, or **8 million adults!**



## Cost of ADHD

- A study in the *Journal of the American Academy of Child and Adolescent Psychiatry* found that the total spending on ADHD ranges from **\$143 billion to \$266 billion a year**, and the direct annual costs for treatment are estimated to be \$1,574 per person, plus \$2,278 a year for family members when indirect costs like productivity losses are taken into account.
- Sales of prescription drugs for ADHD treatment have more than doubled from \$4 billion in 2007 to **\$9 billion** in 2012.

## THE MEDICAL APPROACH


- Allopathic medicine generally focuses on the primary complaint and tries to improve the single problem with a medication.
- Medications, however successful, generally carry unwanted side effects
- Often a patient will have one drug to treat a single problem and two other drugs to treat the side effects of the first drug

## THE MEDICAL APPROACH

- In ADHD, for example, the dominant brainwaves are the slow frequency brainwaves known as Theta and Delta
- Most ADHD medications are stimulants that speed up the brain but the effect is temporary. Remove the stimulant and the brain slows down again.
- In addition to not addressing the root of the problem, stimulant medication also has side effects and we do not know the consequences of its long term use.

## THE MEDICAL APPROACH


- The same is true for all of the medications prescribed for these neurological conditions.
- As long as the patient is on the medication, some improvement is noticed but if the medication is discontinued, there is a high probability the condition will return.



## Possible side effects of ADHD medications


- ADHD drugs sometimes have side effects
- The most common side effects of ADHD medications include:
  - **Decreased appetite/weight loss**
  - **Sleep problems**
  - **Headaches**
  - **Jitteriness**
  - **Social withdrawal**
  - **Stomach aches**

Incidents of abuse of these stimulants have also increased significantly in recent years.



## The Neurofeedback Approach


- Research over the past 40 years has demonstrated that ***dysregulated brainwave activity*** is at the core of most of these conditions.
- Neurofeedback is a sophisticated form of biofeedback that actually trains the brain to normalize the brainwaves and make them flexible and adaptable to situational needs.



## The Neurofeedback Approach

- Neurofeedback is a simple learning modality
- It is painless, drugless and non-invasive
- It is considered safe and effective for both children and adults

Neurofeedback is based upon the principle that there is a normal pattern of brainwave activity and that the brain regulates itself based upon this pattern.



Research demonstrates that this normal pattern may become disrupted resulting in a dysregulated brain and causing neurological symptoms



## What causes Brainwave Dysregulation?

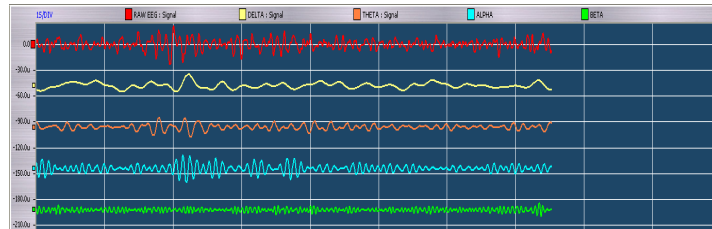
Dysregulation is initiated by any factor that causes a ***prolonged stress response*** within the body.

- Any perceived threat
- Drugs/Toxins/Vaccines
- Poor Nutrition
- Lack of Sunlight (Vitamin D)
- Emotional or Physical Trauma and/or Stress
- Lack of Exercise
- Spinal Subluxation



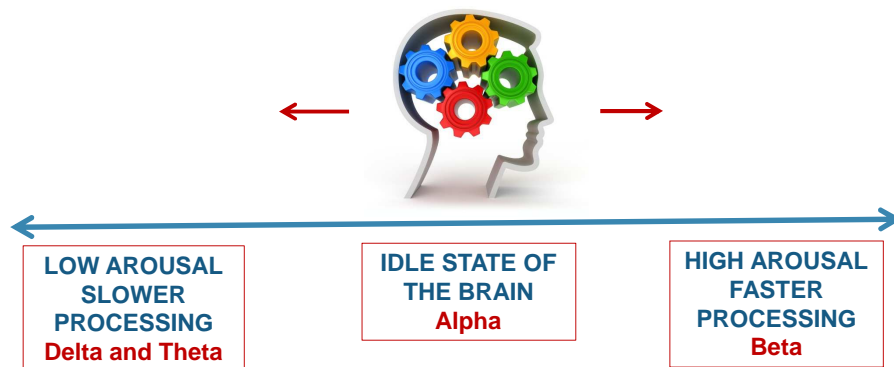
- Mental states are associated with specific brainwaves
- Each brainwave represents a specific processing speed of the brain - also known as arousal level
- These brainwaves include:

- Delta
- Theta
- Alpha
- Beta



## THE AROUSAL SPECTRUM

A healthy, regulated brain is able to shift easily between arousal states as the demands arise



### DELTA/THETA DYSREGULATION -THE UNDER AROUSED BRAIN

SLOW PROCESSING
MID PROCESSING  
IDLE SPEED
FAST PROCESSING

With Delta/Theta Dysregulation the brain tends to operate at a slow processing speed and is considered to be under aroused

Studies have shown that Delta / Theta Dysregulation may be associated with:

|                            |                        |
|----------------------------|------------------------|
| Cognitive Impairment       | Excessive Speech       |
| Impulsivity                | Disorganized           |
| Hyperactivity              | Hyper-emotional        |
| Focus and Attention Issues | Traumatic Brain Injury |
| ADHD                       | Dementia               |
| Socially Inappropriate     | Learning Disorders     |
| Easily distracted          | Autism / Asperger's    |

### ALPHA DYSREGULATION -THE INHIBITED BRAIN

SLOW PROCESSING
IDLE PROCESSING
FAST PROCESSING

With Alpha Dysregulation the brain tends to operate at an idle processing speed and is considered to be inhibited

Studies have shown that Alpha Dysregulation may be associated with:

|                        |                     |
|------------------------|---------------------|
| Depression             | Rumination          |
| Victim Mentality       | Anger               |
| Excessive Self Concern | Self-Deprecation    |
| Passive Aggressive     | Agitation           |
| Irritability           | Fibromyalgia        |
| Avoidance Behavior     | Withdrawal Behavior |

### BETA DYSREGULATION -THE OVER AROUSED BRAIN

SLOW PROCESSING                      IDLE PROCESSING                      **FAST PROCESSING**

With Beta Dysregulation the brain tends to operate at a fast processing speed and is considered to be over aroused

Studies have shown that Beta Dysregulation may be associated with:

|                               |                |
|-------------------------------|----------------|
| Anxiety                       | Panic Attacks  |
| OCD                           | Worry          |
| Migraine / Tension Headaches  | Chronic Pain   |
| Insomnia                      | Hyper-vigilant |
| Obsessive Thinking            | Dislike Change |
| Excessive Rationalization     | Restless       |
| Poor Emotional Self Awareness |                |

## Different Neurofeedback Processes

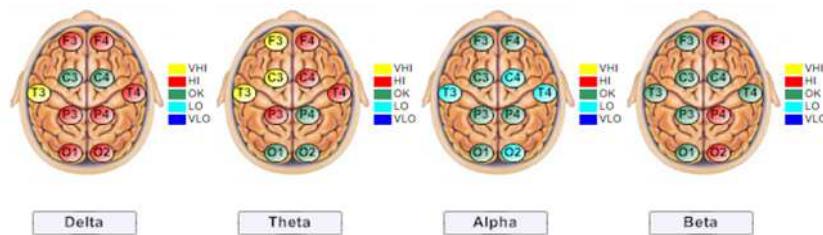
Three Neurofeedback Evaluation Procedures:

- Symptom Based Evaluation
- Single Site Evaluation
- QEEG Evaluation

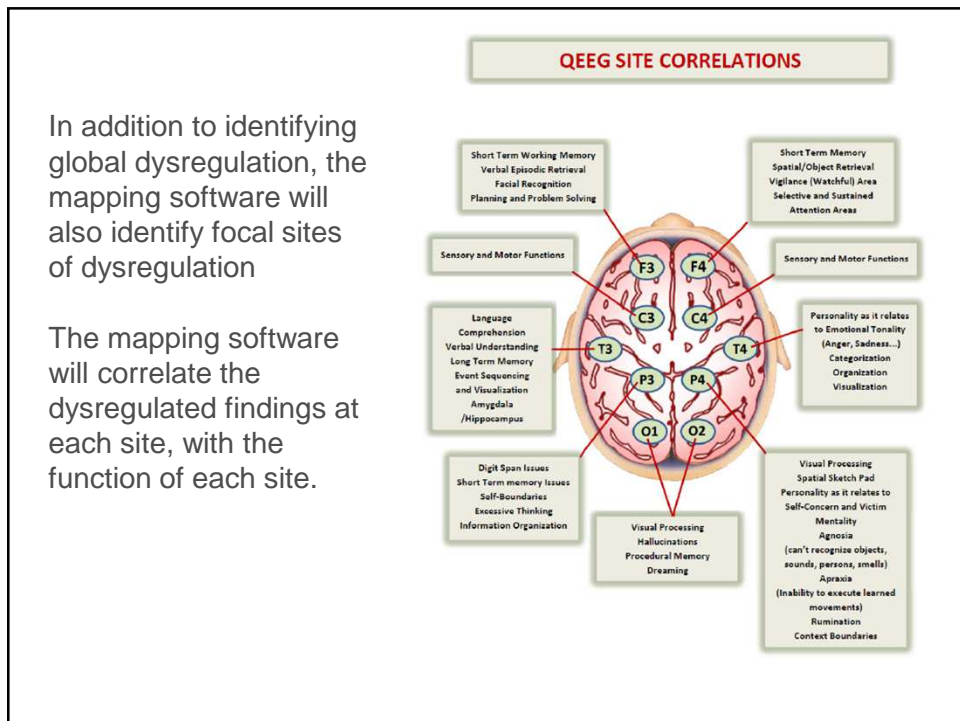
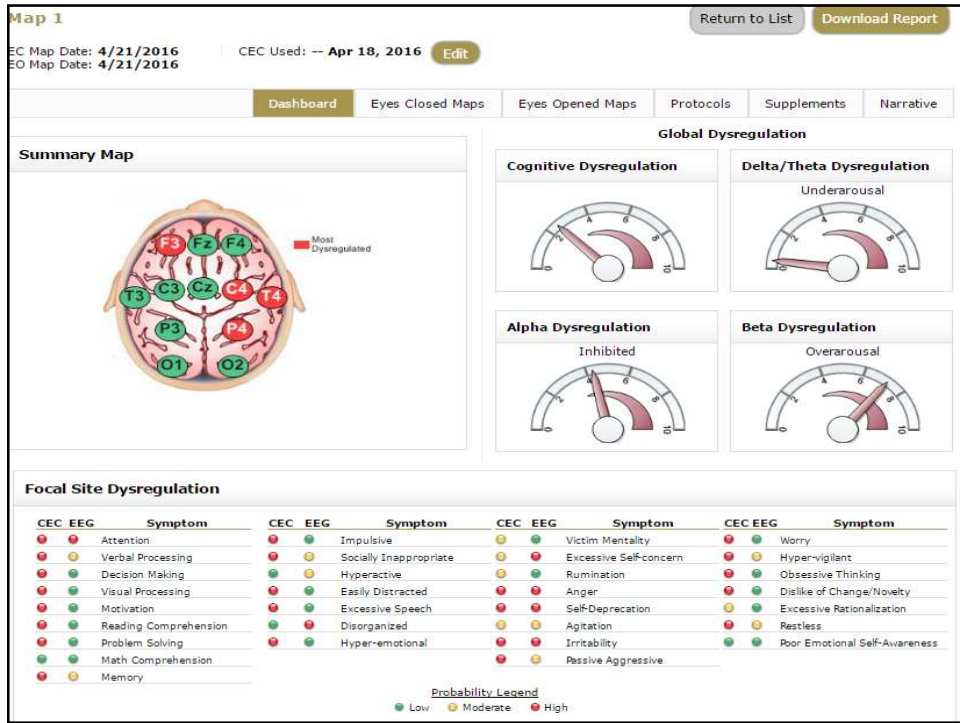


**Dysregulated Brainwave Patterns are Identified on a Quantitative Electroencephalogram or QEEG**

**The Brain Map**



A Brain Map provides us with the information that is required to perform neurofeedback training

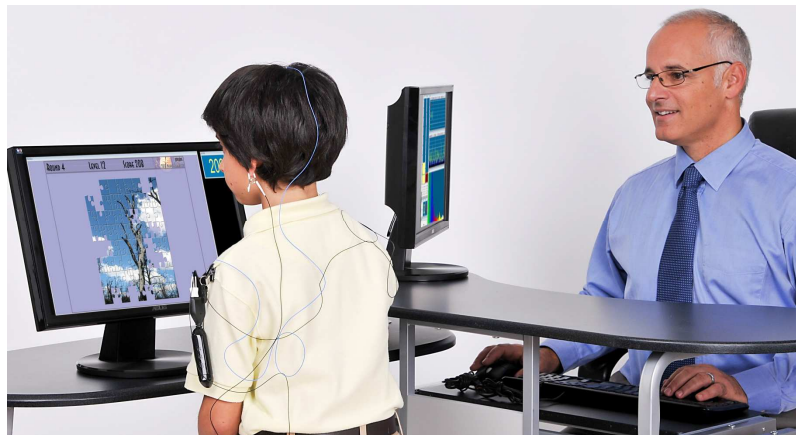


The goal of neurofeedback is not to diagnose or treat any particular condition.

The goal is to transform an unhealthy, dysregulated brainwave pattern into a normal, healthy, organized pattern

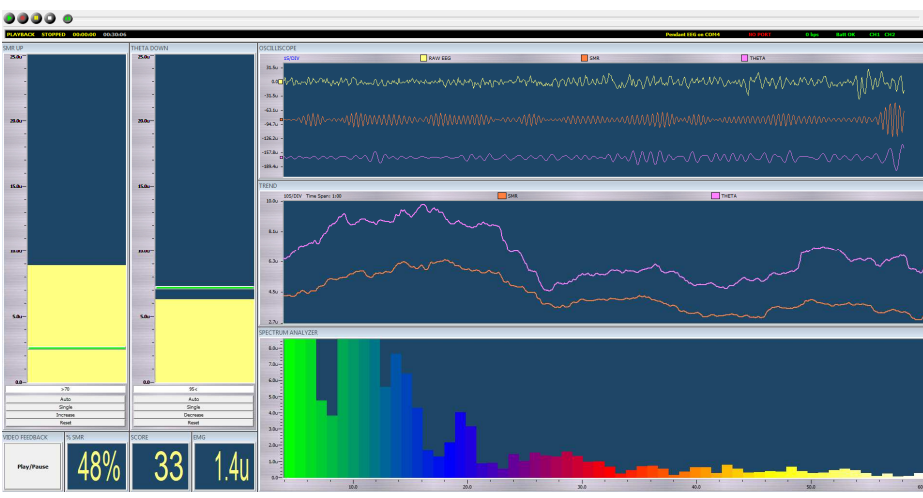


## HOW IS NEUROFEEDBACK DONE?



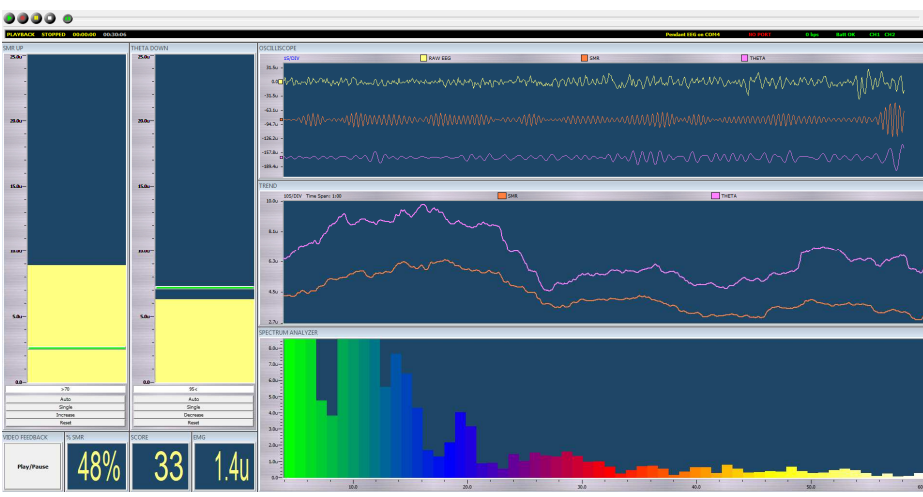
Individuals are hooked up to a computer using wires and sensors and the computer reads their brainwaves





The screenshot displays a software interface for brainwave monitoring. It features several panels: 'THETA DOWN' and 'THETA UP' on the left; 'OSCILLOSCOPE' at the top right showing three waveforms; 'TRIAL' in the middle right showing two line graphs; and 'SPECTRUM ANALYZER' at the bottom right showing a bar chart. A control panel at the bottom left includes 'VIDEO FEEDBACK', 'PLAY/PAUSE', '48%' (in a yellow box), 'SCORE 33', and 'BAG 1.4u'.

Information about these brainwaves is displayed on the technician's monitor



This screenshot is identical to the one above, showing the same software interface for brainwave monitoring with various data panels and control elements.

The software automatically detects when the brainwaves are properly ordered and it feeds that information back to the client



This feedback appears in the form of a game, movie, or sound which signals the client that the brainwaves are becoming more ordered



DVD's and Movies





## Neuroplasticity

Neuroplasticity is the brain's capacity to change and adapt specific neural pathways and synapses in response to the demands placed on it.

This occurs in the brain:

- At the beginning of life when the immature brain organizes itself
- In cases of brain injury, to compensate for lost functions or maximize remaining functions
- Throughout adulthood - whenever something new is learned



## Neuroplasticity and Learning

Changes associated with learning occur mostly at the level of the synapses between neurons.

New synapses can form and the internal structure of the existing synapses can change.

Landmark London taxi/bus driver study

Follow up studies in neurofeedback show that the effects continue for up to 30 years.

**NEUROFEEDBACK**  
Transforming Your Life With Brain Biofeedback

A drug-free therapy that helps people suffering from:  
Anxiety, Depression, Attention Deficit Disorder, ADHD, Bipolar Disorder, OCD, PTSD, Chronic Pain, Insomnia, Autism, Tourette Syndrome, and more.

**Dr. Clare Albright**  
CLINICAL RESEARCHER

**NEURO CONNECTIONS**  
A joint newsletter from the ICF & the Cognitive Neurofeedback Division

**NEUROFEEDBACK IS BASED IN OVER 40 YEARS OF CLINICAL RESEARCH PROVING IT'S EFFICACY**

**SCIENTIFIC AMERICAN MIND**  
THOUGHT • IDEAS • BRAIN SCIENCE

**NeuroMolecular Medicine**

**Neurofeedback and Neuromodulation Techniques and Applications**

**Case Reports in Neurology**

**HEALING POWER OF NEUROFEEDBACK**

**QUANTITATIVE EEG AND NEUROFEEDBACK**


In fact, Dr Frank H. Duffy, a Professor and Pediatric Neurologist at Harvard Medical School, stated that

“Neurofeedback should play a major therapeutic role in many difficult areas. In my opinion, if any medication had demonstrated such a wide spectrum of efficacy it would be universally accepted and widely used”

| <b>EVIDENCE-BASED CHILD AND ADOLESCENT PSYCHOSOCIAL INTERVENTIONS</b><br><small>This report is intended to guide practitioners, educators, youth, and families in developing appropriate plans using psychosocial interventions. It was created for the period November 2012–April 2013 using the PracticeWise Evidence-Based Services (PWEBS) Database, available at www.practicewise.com. If this is not the most current version, please check the American Academy of Pediatrics mental health Web site (www.aap.org/mentalhealth) for updates.</small> |  |  |  |   |   |
|---|--|--|--|---|---|
| Problem Area  | Level 1—BEST SUPPORT   | Level 2—GOOD SUPPORT   | Level 3—MODERATE SUPPORT   | Level 4—MINIMAL SUPPORT   | Level 5—NO SUPPORT  |
| Anxious or Avoidant Behaviors   | Cognitive Behavior Therapy (CBT), CBT and Medication, CBT with Parents, Education, Exposure, Modeling  | Assertiveness Training, Attention, CBT for Child and Parent, Cultural Storytelling, Family Psychoeducation, Hypnosis, Relaxation, Stress Inoculation   | Contingency Management, Group Therapy  | Biofeedback, CBT with Parents Only, Play Therapy, Psychodynamic Therapy, Rational Emotive Therapy   | Assessment/Monitoring, Attachment Therapy, Client Centered Therapy, Eye Movement Desensitization and Reprocessing (EMDR), Peer Filing, Psychoeducation, Relationship Counseling, Teacher Psychoeducation  |
| Attention and Hyperactivity Behaviors   | Behavior Therapy and Medication, Biofeedback, Parent Management Training, Self-Verbalization   | Contingency Management, Education, Parent Management Training (with Problem Solving, or with Teacher Psychoeducation), Physical Exercise (with or without Relaxation), Social Skills and Medication, Working Memory Training   | Biofeedback and Medication   | Parent Management Training and Social Skills, Relaxation, Self-Verbalization and Contingency Management, Social Skills  | Attention Training, Client Centered Therapy, CBT, CBT and Anger Control, CBT and Medication, Family Therapy, Parent Coping/Class Management, Parent Management Training and Self-Verbalization, Problem Solving, Psychoeducation, Self-Control Training, Self-Verbalization and Medication, Skill Development   |
| Autism Spectrum Disorders   | Intensive Behavior Therapy, Intensive Communication Training   | Parent Management Training, Peer Filing, Physical/Social/Occupational Therapy  | None   | Cognitive Behavior Therapy, Massage, Social Skills  | Auditory Integration Training, Biofeedback, Eclectic Therapy, Hyperbaric Treatment, Modeling, Structured Listening  |
| Delinquency and Disruptive Behavior   | Anger Control, Assertiveness Training, CBT, Multisystemic Therapy, Parent Management Training, Parent Management Training and Problem Solving, Social Skills | Communication Skills, Contingency Management, Functional Family Therapy, Parent Management Training and CBT, Parent Management Training and Classroom Management, Problem Solving, Rational Emotive Therapy, Relaxation, Therapeutic Foster Care, Transactional Analysis                       | Client Centered Therapy, Family Therapy, Moral Reasoning Training, Outreach Counseling, Peer Filing, Self-Control Training | CBT and Teacher Training, Parent Management Training, Classroom Contingency Management, and CBT, Parent Management Training and Self-Verbalization; Physical Exercise; Stress Inoculation | Behavioral Family Therapy, Catharsis, CBT and Anger Control, CBT with Parents, Collaborative Problem Solving, Education, Exposure, Family Empowerment, Family Systems Therapy, Group Therapy (I), Imagery Training, Parent Management Training and Peer Support, Play Therapy, Psychodynamic Therapy, Self-Verbalization, Skill Development, Wraparound |
| Depressive or Withdrawn Behaviors   | CBT, CBT and Medication, CBT with Parents, Family Therapy  | Client Centered Therapy, Cognitive Behavioral Psychoeducation, Expressive Writing/Journaling/Diary, Interpersonal Therapy, Relaxation  | None   | Problem Solving, Self-Control Training, Self-Modeling   | Life Skills, Play Therapy, Psychodynamic Therapy, Psychoeducation, Social Skills  |
| Eating Disorders  | None   | CBT, Family Therapy, Family Systems Therapy  | None   | None  | Client Centered Therapy, Education, Goal Setting  |
| Elimination Disorders   | Behavior Alert; Behavior Alert and Behavioral Training; Behavioral Training, Dietary Care, and Medical Care (with or without Biofeedback)                    | Behavioral Training and Dietary Care; Behavioral Training, Hypnosis, and Dietary Care; CBT   | Behavior Alert and Medication  | None  | Assessment/Monitoring, Assessment/Monitoring and Medication, Behavioral Training and Medical Care, Biofeedback, Contingency Management, Dietary Care, Dietary Care and Medical Care, Hypnosis, Medical Care, Psychoeducation  |
| Mania   | None   | Cognitive Behavioral Psychoeducation   | None   | None  | Family-Focused Therapy, Psychoeducation   |
| Substance Use   | CBT, Community Reinforcement, Family Therapy   | Assertive Continuing Care, CBT and Medication, CBT with Parents, Contingency Management, Family Systems Therapy, Functional Family Therapy, Goal Setting/Monitoring, Motivational Interviewing/Engagement (with and without CBT), Multidimensional Family Therapy, Purdue Brief Family Therapy | Drug Court, Drug Court with Multisystemic Therapy and Contingency Management   | Goal Setting  | Behavioral Family Therapy, CBT and Functional Family Therapy, Client Centered Therapy, Drug Court and Multisystemic Therapy, Education, Family Court, Group Therapy (II), Motivational Interviewing/Engagement with CBT and Family Therapy, Multisystemic Therapy, Parent Psychoeducation, Problem Solving, Project CARE (I), Psychoeducation           |
| Suicidality   | None   | Attachment Therapy, Counselors Care, Counselors Care and Support Training, Multisystemic Therapy, Social Support Team  | None   | None  | Accelerated Hospitalization, Counselors Care and Anger Management   |
| Traumatic Stress  | CBT, CBT with Parents  | Exposure   | None   | EMDR, Play Therapy, Psychodrama   | Client Centered Therapy, CBT and Medication, CBT with Parents Only, Interpersonal Therapy, Psychodynamic Therapy, Psychoeducation, Relaxation   |

Note: Level 5 refers to treatments whose bests were unresponsive or inconclusive. The symbol (I) indicates that at least one study found negative effects on the main outcome measure. The risk of using treatments so designated should be weighed against potential benefits. This report updates and replaces the "Blue Menu" originally distributed by the Naval Department of Health, Child and Adolescent Mental Health Division, Evidence-Based Services Committee from 2002–2009. The representatives in this publication do not indicate an exclusive source of resources or serve as a standard of medical care. Variations, using one or more individual circumstances, may be appropriate. Original document included as part of Addressing Mental Health Concerns in Primary Care in Children's Health, Copyright © 2011. All Rights Reserved. The American Academy of Pediatrics does not endorse or endorse any modifications made to this document and is not aware that AAP be held for any such change.


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## More recognition of neurofeedback

The Child and Adolescent Psychiatric Clinics of North America determined that:

“EEG Biofeedback meets the American Academy of Child and Adolescent Psychiatry criteria for clinical guideline for treatment of ADHD, seizure disorders, anxiety (i.e. OCD, GAD, PTSD, phobias), depression, reading disabilities and addictive disorders. This suggests that EEG biofeedback (aka. Neurofeedback) should always be considered as an intervention for these disorders by the clinician.”



Thank you for attending our session!

Questions?

Comments?