



Brain Chemistry

Dr Daniel G Amen, MD is a clinical neuroscientist, psychiatrist, and brain-imaging expert who heads up the world-renowned Amen Clinics. He is a Distinguished Fellow of the American Psychiatric Association and has won numerous writing and research awards. The information here was published in his book "Change your Brain, Change your Life: The Breakthrough Program for Conquering Anxiety, Depression, Obsessiveness, Anger, and Impulsiveness"

I hope you find this discussion of interest and value, and can use this material to help yourself, your family and your patients. Please call if you have any questions or if you'd like additional information.

~Your Friends at Nutri-Dyn~

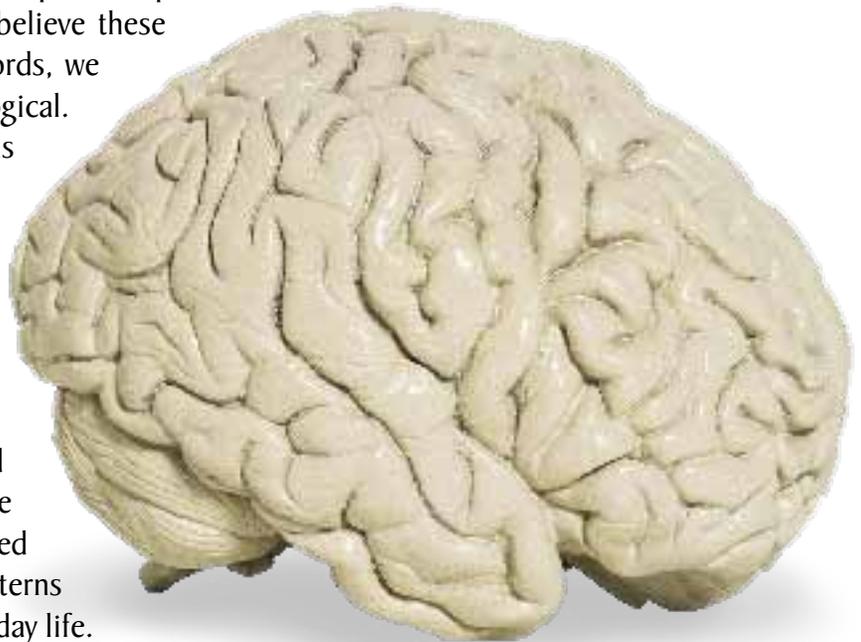
THE WORK OF DANIEL G. AMEN MD:

CHANGE YOUR BRAIN CHEMISTRY... CHANGE YOUR LIFE

If our pursuit of a longer life is to have any meaning, protecting and improving brain health is vital. How your brain works determines how happy you are, how effective you feel, and how well you interact with others. Our brain patterns help us (or hurt us) with our marriage, parenting skills, work, and spiritual beliefs along with our experiences of pleasure and pain.

If we are anxious, depressed, obsessive-compulsive, prone to anger, or easily distracted, we probably believe these problems are "all in our head." In other words, we believe the problems are purely psychological. However, research shows that the problems are related to the physiology of the brain.

We are going to discuss 5 of the brain's systems that are most intimately involved with our behavior. A screening questionnaire for each system will be provided. We will give nutritional advice, lifestyle modification strategies, and possible medication options to balance these interactive systems. These specific, brain-based recommendations will help to optimize the patterns in the brain to support more effective day-to-day life.



Limbic System

Includes the thalamic structures, hypothalamus, along with the immediate surrounding structures.

FUNCTIONS OF THE DEEP LIMBIC SYSTEM:

- Sets the emotional tone of the mind.
- Filters external events through internal states (creates emotional coloring).
- Tags events as internally important.
- Stores highly charged emotional memories.
- Modulates motivation.
- Controls appetite and sleep cycles.
- Promotes bonding.
- Directly processes the sense of smell.
- Modulates libido.

DEEP LIMBIC CHECKLIST

Use the following scale and place the appropriate number next to the item. Five or more symptoms, marked a 3 or 4, indicate a high likelihood of deep limbic problems

0=never 1=rarely 2=occasionally 3=frequently 4= very frequently

- ____ 1. Feelings of sadness
- ____ 2. Moodiness
- ____ 3. Negativity
- ____ 4. Low energy
- ____ 5. Irritability
- ____ 6. Decreased interest in others
- ____ 7. Feelings of hopelessness about the future
- ____ 8. Feelings of helplessness or powerless
- ____ 9. Feeling dissatisfied or bored
- ____ 10. Excessive guilt
- ____ 11. Suicidal feelings
- ____ 12. Crying
- ____ 13. Lowered interest in previously enjoyable things
- ____ 14. Sleep changes (too much or too little)
- ____ 15. Appetite changes
- ____ 16. Low self esteem
- ____ 17. Decreased interest in sex
- ____ 18. Negative sensitivity to smells/odors
- ____ 19. Forgetfulness
- ____ 20. Poor concentration

This part of the brain is involved in setting emotional tone. When the deep limbic system is less active, there is generally a positive, more hopeful state of mind. When it is heated up, or overactive, negativity can take over.

Females, on average, have a larger deep limbic system than males. This gives females several advantages and disadvantages. Women are more in touch with their feelings, and generally better able to express their feelings than men. They have an increased ability to bond and be connected to others (one of the reasons they make the better primary caretakers of children). The larger deep limbic system also leaves females more susceptible to depression (especially at times of hormonal changes).

LIFESTYLE THERAPIES

1. ELIMINATE AUTOMATIC NEGATIVE THOUGHTS (ANTS).

First you need to notice that you're having them. If you catch them at the moment they occur and correct them, you take away the power they have over you. When a negative thought goes unchallenged, your mind believes it and your body reacts to it.

2. SURROUND YOURSELF WITH PEOPLE WHO PROVIDE POSITIVE BONDING.

Spend time with people who enhance the quality of your limbic system rather than those who inflame it.

3. BUILD PEOPLE SKILLS TO ENHANCE LIMBIC BONDS.

Research shows that enhancing emotional bonds between people will heal the limbic system.

4. RECOGNIZE THE IMPORTANCE OF PHYSICAL CONTACT.

Touch is essential to our humanity. Yet, in our standoffish, litigious society, touch is becoming less and less frequent. Touch your children, spouse, your loved ones regularly. Giving and receiving massages on a regular basis will enhance limbic health and limbic bonding.

5. SURROUND YOURSELF WITH GREAT SMELLS.

Smells have an effect on moods. The right smells (such as lavender) likely cool the deep limbic system. Pleasing fragrances are like an anti-inflammatory. Surround yourself with flowers, sweet fragrances, and other pleasant smells.

6. BUILD A LIBRARY OF WONDERFUL MEMORIES.

By calling up pleasant memories we can tone our mental state to be healthier. The brain then takes on the same chemical patterns that were inputted at the time the healthy events occurred.

7. TRY PHYSICAL EXERCISE.

It increases endorphins, blood flow to the brain, energy, metabolism, and the neurotransmitters of the brain.

NUTRITIONAL SUPPORT

- EPA-DHA EXTRA STRENGTH (M840E) 1-2 caps twice daily. Omega 3 fatty acids are needed for deep limbic system function.
- PURE-L-TRYPTOPHAN (K480) 1,000-3,000 mg before bed. Enhances serotonin levels. Low levels are associated with worrying, moodiness, emotional rigidity, and irritability.
- L-TYROSINE (P994) 1,000-1,500 mg daily on empty stomach. Increases norepinephrine and dopamine levels. Low levels are associated with depression, lethargy, trouble focusing, negativity, and mental fuzziness.
- CENITOL (M122) Myoinositol and magnesium. 1-3 scoops daily in water/juice. Myoinositol bio-accumulates in the brain and nervous system reducing depression, moodiness, and panic attacks.
- Eat a 40-30-30 diet (40% protein, 30% complex carbs, 30% high quality oils).

POSSIBLE LIMBIC MEDICATIONS

In significantly depressed patients consider antidepressants carefully monitored by a health professional, or St. John's Wort (M946) at 1 tablet 2-3 times daily. St. John's Wort has very few side effects in comparison to pharmaceutical options .

The Basal Ganglia

FUNCTIONS OF THE BASAL GANGLIA SYSTEM:

- Integrates feeling and movement.
- Shifts and smoothes fine motor behavior.
- Suppresses unwanted motor behaviors.
- Sets the body's idle speed or anxiety level.
- Enhances motivation.
- Mediates pleasure/ecstasy.

The basal ganglia are a set of large structures toward the center of the brain that surround the deep limbic system. When the basal ganglia are overactive (anxiety tendencies/disorders), people are more likely to be overwhelmed by stressful situations and have a tendency to become immobile in thoughts or actions. When their basal ganglia are under-active (as seen in ADD), a stressful situation often moves them to action.

BASAL GANGLIA CHECKLIST

Use the following scale and place the appropriate number next to the item. Five or more symptoms, marked 3 or 4, indicate a high likelihood of basal ganglia problems.

0= never 1=rarely 2=occasionally 3=frequently 4= very frequently

- _____ 1. Feelings of nervousness or anxiety
- _____ 2. Panic attacks
- _____ 3. Symptoms of heightened muscle tension (headaches, sore muscles, hand tremors)
- _____ 4. Periods of heart pounding, rapid heart rate, chest pain
- _____ 5. Periods of trouble breathing, or feeling smothered
- _____ 6. Periods of feeling faint, dizzy, or unsteady on feet
- _____ 7. Periods of nausea, or abdominal upset
- _____ 8. Periods of sweating, hot/cold flashes, cold hands
- _____ 9. Tendency to predict the worst
- _____ 10. Fear of dying or doing something crazy
- _____ 11. Avoidance of public places, fearing an anxiety attack
- _____ 12. Conflict avoidance
- _____ 13. Excessive fear of being judged
- _____ 14. Persistent phobias
- _____ 15. Low motivation
- _____ 16. Excessive motivation
- _____ 17. Tics
- _____ 18. Poor handwriting
- _____ 19. Quick startle reaction
- _____ 20. Tendency to freeze in anxiety-provoking situations
- _____ 21. Excessive worry about what others think
- _____ 22. Shyness or timidity
- _____ 23. Low threshold of embarrassment

LIFESTYLE THERAPIES

1. KILL THE FORTUNE-TELLING ANTS (AUTOMATIC NEGATIVE THOUGHTS).

People who have basal ganglia problems are often experts at predicting the worst. You can learn to change this pattern and help the basal ganglia cool down by predicting the best things.

2. USE GUIDED IMAGERY (GO TO A MEDITATION HAVEN: A BENCH, MOUNTAINS, A PLACE OF TOTAL RELAXATION - TRY TO FEEL YOU ARE ACTUALLY THERE).

Take 20-30 minutes a day to train relaxation into your body - it will decrease anxiety, blood pressure, pain/tension in muscles, and improve temperament.

3. DIAPHRAGMATIC BREATHING. BREATHE SLOWLY AND DEEPLY, MOSTLY WITH YOUR BELLY.
4. THINK ABOUT THE 18/40/60 RULE.

When you're 18, you worry about what everyone is thinking of you; when you're 40, you don't care about what people think of you; when you're 60, you realize nobody was thinking about you at all. We need to base our behavior on what we think, not on what we think others think.

5. LEARN HOW TO DEAL WITH CONFLICT.

Many people are so afraid of conflict, they avoid it at any cost. This "conflict phobia" actually sets up relationships for more turmoil than less. Being assertive means expressing your feelings in a firm, yet reasonable way. It doesn't mean being aggressive or obnoxious. It also helps to cool down our basal ganglia.

NUTRITIONAL SUPPORT

- GLYCOGENICS (M845) 1-2 tablets twice daily. B-vitamins have a soothing, calming effect on the brain and nervous system.
- SERENAGEN (M930) 1-2 tablets three times daily. Balances energy flow through the nervous system, adrenals, heart meridians. Has a natural calming effect.
- MYOCALM P.M. (M882) 1-2 twice daily and before bed to aid sleep. The herbals in this formula have been the non-toxic choice for nervous tension and panic attacks.
- High protein, low carbohydrate diet to maintain healthy blood sugar levels (menu planning available in the UltraGlycemX patient guide book through Nutrition Dynamics).
- Avoid caffeine and alcohol - Both raise anxiety levels.

POSSIBLE BASAL GANGLIA MEDICATION

In severe or difficult anxiety, medications such as Buspar, or in focal basal ganglia abnormalities, nerve stabilizing medications such as Lithium or Tegretol.

The Prefrontal Cortex

FUNCTIONS OF THE PREFRONTAL CORTEX:

- Attention span
- Perseverance
- Judgement
- Impulse control
- Organization
- Self-monitoring and supervision
- Problem solving
- Critical thinking
- Forward thinking
- Learning from experience
- Ability to feel and express emotions
- Interaction with the limbic system
- Empathy

The prefrontal cortex (PFC) is the most evolved part of the brain. Overall, the PFC is the part of the brain that watches, supervises, guides, directs, and focuses your behavior. Succinctly put, the PFC provides the capacity to formulate goals, to make plans for their execution, to carry them out in an effective way, and to change course and improvise in the face of obstacles, or failure in the absence of external direction/structure.

PREFRONTAL CORTEX CHECKLIST

Use the following scale and place the appropriate number next to the item. Five or more symptoms, marked 3 or 4, indicate a high likelihood of prefrontal cortex problems.

0=never 1=rarely 2=occasionally 3=frequently 4=very frequently

- _____ 1. Inability to give close attention to details, making careless mistakes
- _____ 2. Trouble sustaining attention in routine situations (homework, chores, paperwork etc.)
- _____ 3. Trouble listening
- _____ 4. Inability to finish things, poor follow through
- _____ 5. Poor organization of time or space
- _____ 6. Distractibility
- _____ 7. Poor planning skills
- _____ 8. Lack of clear goals or forward thinking
- _____ 9. Difficulty expressing feelings
- _____ 10. Difficulty expressing empathy for others
- _____ 11. Excessive daydreaming
- _____ 12. Boredom
- _____ 13. Apathy or lack of motivation
- _____ 14. Lethargy
- _____ 15. A feeling of spaciness or being in a fog
- _____ 16. Restlessness or trouble sitting still
- _____ 17. Difficulty remaining seated in situations where it's expected
- _____ 18. Conflict seeking
- _____ 19. Talking too much or too little
- _____ 20. Blurting out answers before questions have been completed
- _____ 21. Difficulty awaiting turn
- _____ 22. Interruption of others (e.g. butting into conversations games)
- _____ 23. Impulsivity (doing/saying without thinking first)
- _____ 24. Trouble learning from experience, making repetitive mistakes.

LIFESTYLE THERAPIES

1. DEVELOP AND MAINTAIN CLEAR FOCUS.

Developing an ability to stay totally focused will help guide our thoughts and behavior and give us an "auxiliary prefrontal

cortex." One great way to do this is have specific goals for each facet of our lives relationships, work, money, and self. Being goal-directed helps keep our behavior on track.

2. FOCUS ON WHAT YOU LIKE, NOT WHAT YOU DON'T LIKE (ESPECIALLY PEOPLE).

What we attend to and focus on has a very significant impact on how we feel daily. Focusing on the negative aspects of others or of your own life makes us more vulnerable to depression and damages relationships.

3. HAVE MEANING, PURPOSE, STIMULATION, AND EXCITEMENT IN YOUR LIFE.

People with PFC problems struggle with mundane tasks, even with appropriate therapy. Having purpose, stimulation, and excitement in their lives can be the difference between success and chronic failure (needed in all facets of life: family, work, relationships, and spirituality)

4. GET ORGANIZED AND GET HELP WHEN NEEDED.

People with PFC difficulties have problems with organization. The most successful people with PFC/ADD problems are those who have help in organizing their lives.

5. BRAIN-WAVE BIOFEEDBACK TRAINING.

This technique has been effective in decreasing impulsivity and aggressiveness. It helps the person to take more control over his/her own physiological processes.

6. DON'T BE ANOTHER PERSON'S STIMULANT.

Remember, people with ADD and other PFC problems are conflict-seeking to stimulate their own adrenaline rush and feeling of well-being. Don't respond to them, "pushing your buttons" by yelling; but as their voice goes up, yours should go down. If you feel the situation is getting out of control, take a bathroom break. Tell them you understand and want to work on it, but can only do it when things are calm.

7. TRY MOZART FOR FOCUS. (100 MASTERPIECES, VOL. 3, THE MARRIAGE OF FIGARO, FLUTE CONCERTO #2 IN D, DON GIOVANNI, ETC.)

Especially effective in ADD. Listening displayed better focus and mood control, diminished impulsivity, and improved social skills.

NUTRITIONAL SUPPORT

- L-TYROSINE (P994) 500-1,500 mg. 2-3 times daily (empty stomach). Tyrosine has a positive effect on brain dopamine levels and helps with focus and energy.
- PROANTHO-60 (R351) 1 mg per 1 pound of body weight. Crosses the blood brain barrier, providing a powerful antioxidant effect.
- BALANCED EPA-DHA Liquid (M817) 1-2 tablespoons daily. Lemon-flavored EPA-DHA. Numerous studies indicate the beneficial effects of EPA-DHA on cell membrane health and behavioral/intellectual function.
- MENTALIN (M859) 1-2 tablets 3 times daily. Proprietary herbal formula that works with energy, focus, and impulse control.
- Eat a high protein, low carbohydrate diet to stabilize blood sugar and helps with energy levels and concentration. Good protein sources are lean meats, eggs, nuts, legumes, and low-fat cheeses (organic if possible).

POSSIBLE PFC MEDICATION

In difficult cases with limited response to diet and lifestyle stimulant, medications could be considered (Adderall is preferred).

The Cingulate System

FUNCTIONS OF THE CINGULATE SYSTEM:

- Ability to shift attention
- Cognitive flexibility
- Adaptability
- Movement from idea to idea
- Ability to see options
- Ability to go with the flow
- Ability to cooperate

This is the part of the brain that allows you to shift your attention from one thing to another, to move from idea to idea, to see options in life. Feelings of safety and security have also been attributed to this part of the brain. A good term to describe this would be "cognitive flexibility." Being able to see options and new ideas protects against stagnation, depression, and hostile behavior.

CINGULATE SYSTEM CHECKLIST

Use the following scale and place the appropriate number next to the item. Five or more symptoms, marked 3 or 4, indicate a high likelihood of cingulate problems.

0=never 1=rarely 2=occasionally 3=frequently 4=very frequently

- ____ 1. Excessive or senseless worrying
- ____ 2. Being upset when things don't go your way
- ____ 3. Being upset when things are out of place
- ____ 4. Tendency to be argumentative or oppositional
- ____ 5. Tendency to have repetitive negative thoughts
- ____ 6. Tendency toward compulsive behaviors
- ____ 7. Intense dislike of change
- ____ 8. Tendency to hold grudges
- ____ 9. Trouble shifting attention from subject to subject
- ____ 10. Trouble shifting behavior from task to task
- ____ 11. Difficulties seeing options in situations
- ____ 12. Tendency to hold on to own opinion and not listen to others
- ____ 13. Tendency to get locked into a course of action, whether good or not.
- ____ 14. Being very upset unless something is done a certain way
- ____ 15. Perception by others that you worry too much
- ____ 16. Tendency to say no without first thinking about the question
- ____ 17. Tendency to predict negative outcomes

LIFESTYLE THERAPIES

1. NOTICE WHEN YOU'RE STUCK, DISTRACT YOURSELF, AND COME BACK TO THE PROBLEM LATER.

Whenever you find your thoughts cycling (going over and over), distract yourself from them (sing a song, take a walk, do a chore, play with a pet, meditate, etc).

2. THINK THROUGH ANSWERS BEFORE AUTOMATICALLY SAYING NO.
Often, it is helpful to take a deep breath, hold for 3 seconds, and then take 5 seconds to exhale just to get extra time before responding.

3. WRITE OUT OPTIONS AND SOLUTIONS WHEN YOU FEEL STUCK.
After you write out a thought that has gotten stuck, generate a list of things you can do about it, and things you can't do about it.

4. SEEK THE COUNSEL OF OTHERS WHEN YOU FEEL "STUCK".
Find a mentor to help see another side of the problem, other options.

5. MEMORIZE AND RECITE THE SERENITY PRAYER WHEN BOTHERED BY REPETITIVE THOUGHTS.
"God, grant me the serenity to accept the things I cannot change, the courage to change the things I can, and the wisdom to know the difference." This is a beautiful reminder that there are limits to what we can do in life.

6. DON'T TRY TO CONVINCING SOMEONE ELSE WHO IS STUCK. TAKE A BREAK AND COME BACK LATER.
If you distract yourself from a lose-lose situation, you're often able to come back later and work it out.

7. TRY MAKING PARADOXICAL REQUESTS.
Remember "reverse psychology"? It works with Cingulate folks too, but you need to be sly about it.

8. EXERCISE.
Exercise can be very helpful in calming worries and increasing cognitive flexibility, as well as distracts from bad/negative thoughts.

NUTRITIONAL SUPPORT

- ST. JOHN'S WORT (M946) 1-2 tablets twice daily. Modulates the brain chemistry, especially serotonin.
- PURE L-TRYPTOPHAN (K480) 1,500-3,000 mg daily. Increases serotonin levels. Low serotonin levels and increased cingulate activity are often associated with worrying, moodiness, emotional rigidity, and irritability.
- CENITOL (M122) 1 scoop 2-3 times daily. Myoinositol supports the brain and nervous system, while the magnesium will calm the person through parasympathetic nervous system effect.
- A moderate protein, higher complex carbohydrate diet will result in more L-tryptophan being available to enter the brain, where it is converted to serotonin. This diet will provide proteins (particularly chicken, turkey, salmon, beef, eggs, peanut butter, etc.) high in L-tryptophan, as well as the tryptophan-transporting carbohydrates.

POSSIBLE CINGULATE MEDICATIONS

In patients slow to respond to nutritional and lifestyle therapy or seriously ill individuals, consideration of serotonin enhancing medications such as Zoloft, Paxil, Effexor, Luvox, or Serzone could be added.

The Temporal Lobes

FUNCTIONS OF THE TEMPORAL LOBES:

Dominant side (usually the left).

- Understanding and processing language
- Intermediate-term memory
- Long-term memory
- Auditory learning
- Retrieval of words
- Complex memories
- Visual and auditory processing
- Emotional stability

Non-dominant side (usually the right).

- Recognizing facial expressions
- Decoding vocal intonation
- Rhythm
- Music
- Visual learning

The most precious treasures we have in life are the images we store in the memory banks of our brains. The sum of these stored experiences is responsible for our sense of personal identity and our sense of connectedness to those around us. The temporal lobes, on either side of the brain behind the eyes and underneath the temples, store the memories and images and help us define our sense of self.

TEMPORAL LOBE CHECKLIST

Use the following scale and place the appropriate number next to the item. Five or more symptoms, marked 3 or 4, indicate a high likelihood of temporal lobe problems.

0=never 1=rarely 2=occasionally 3=frequently 4=very frequently

- _____ 1. Short fuse, or periods of extreme irritability
- _____ 2. Periods of rage with little provocation
- _____ 3. Frequent misinterpretation of comments as negative, when they are not
- _____ 4. Irritability that tends to build, then explode, then recede. Person often feels tired after a rage
- _____ 5. Periods of spaciness or confusion
- _____ 6. Periods of panic and/or fear for no specific reason
- _____ 7. Visual or auditory changes, such as seeing shadows or hearing muffled sounds
- _____ 8. Frequent periods of *deja vu*, or *jamais vu* (not recalling a familiar place/person)
- _____ 9. Sensitivity or mild paranoia
- _____ 10. Headaches or abdominal pain of uncertain origin
- _____ 11. History of a head injury or family history of violence or explosiveness
- _____ 12. Dark thoughts, such as suicidal or homicidal thoughts
- _____ 13. Periods of forgetfulness
- _____ 14. Memory problems
- _____ 15. Reading comprehension problems
- _____ 16. Preoccupation with moral or religious ideas

LIFESTYLE THERAPIES

1. CREATE A LIBRARY OF WONDERFUL EXPERIENCES.

Record the memorable experiences of your life with pictures, videos, diary entries, etc. Strive for a series of experiences that keep you motivated, healthy, and excited about your life.

2. SING WHENEVER/WHEREVER YOU CAN.

Song is a true joy of life, no matter how you sing.

3. USE HUMMING AND TONING (MAKING SOUNDS WITH ELONGATED VOWELS-AH,AY,OH,OM) TO TUNE UP YOUR BRAIN.

All forms of vocalization, including singing, chanting, yodeling, humming, reciting poetry, and simple talk, can be therapeutic.

4. LISTEN TO CLASSICAL MUSIC.

Listening to music can activate and stimulate the temporal lobes and bring peace and excitement to your mind.

5. LEARN TO PLAY A MUSICAL INSTRUMENT.

This increases visual-spatial skill, increases scores by 51 points on the verbal portion of SAT tests and by 39 points on the math section. Helpful in development/activation of temporal lobe neurons.

6. MOVE IN RHYTHMS.

Chanting, dancing, and other forms of rhythmic movement can be healing.

7. GET ENOUGH SLEEP.

Decreased sleep (less than 6 hours a night) is associated with mood instability, decreased cognitive ability, irritability, and periods of spaciness, all temporal lobe problems.

8. ELIMINATE CAFFEINE AND NICOTINE.

These are powerful vasoconstrictors that decrease blood flow to the brain, especially the temporal lobes.

NUTRITIONAL SUPPORT

- CERALIN (M114) 1-2 tablets twice daily. Support for healthy brain function, memory, and cognition.
- PHOSPHATIDYL SERINE (P800) 1-2 capsules twice daily. Shows improvement in attention, concentration, short term memory, self-sufficiency, and unadaptable behavior.
- EPA-DHA EXTRA-STRENGTH (M840) 1-2 capsules twice daily. Pro-motes membrane fluidity, and reduces inflammation. Studies show improved intellectual capacity when supplementing EPA-DHA.
- Reduce or eliminate sugar intake. If aggressiveness with depression, obsessive thoughts, then a higher protein/lower simple carbohydrate diet is generally effective. If aggressiveness with ruminations, moodiness, and depression, then a balance of protein/carbohydrates is recommended.

POSSIBLE TEMPORAL LOBE MEDICATIONS

In difficult cases or minimal responders to lifestyle and nutritional therapies, the use of anti-seizure medications (Depakote, Neurontin, Lamictal, etc) are effective in stabilizing abnormal activity in the temporal lobes.

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Brain Chemistry • PAGE 6 OF 6

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