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Cognitive Decline

Cognitive Decline, which often presents as “forgetfulness”, is of concern for those experiencing it and for those who interact on a regular basis with the person experiencing such. It is important to keep in mind that not all “forgetfulness” will proceed on to a more serious form of dementia, such as Alzheimer’s Disease. However, it is equally important to keep in mind that once Cognitive Decline proceeds to the point of dementia, available treatment is virtually useless, providing minimal help for those with moderate to severe forms of dementia and little to no help for those with mild dementia (to prevent progression). Thus, prevention becomes the more attractive approach to addressing this problem, and most of the work regarding the issue currently rests in the nutrition/health approach. Active research is under way seeking medications that will prevent or ameliorate the effects of dementia, but until such medications have been developed and tested for safety and effectiveness, we must deal with what we have available. Studies looking at the nutrition/health approach are rather limited too, presently composed largely of observation only, not randomized trials, but there has been some optimism generated, particularly if the intervention is early and well planned. Following is a plan that can be implemented for all stages of Cognitive Decline, from prevention to treatment of the more severe forms.

First, complete the **Memory Screen** that follows. Do not anguish over each question, just select your initial impression. The idea is to establish a baseline so that when preventative treatment is initiated, serial screenings can be performed to see if there is improvement over time. Note the “level of concern” is divided into three categories, “low”, “moderate”, and “most”. This will allow for staging the aggressiveness of the intervention (treatment), “low” needing simple prevention tactics, “moderate” and “most” requiring more intensive attention.

Second, if your score on the Memory Screen is less than 90, a **Mini-Mental Status Exam (MMSE)** should be performed. If this test shows a perfect score of 30 or only a loss down to 28, then prevention tactics can be initiated if desired and simple monitoring pursued. If the score is 27 or less, treatment is strongly advised, the lower the score, the more aggressive the treatment. The goal is to maintain a score of 25 or more.

Third, once the level of intervention is established, the **Metabolic Enhancement for NeuroDegeneration (MEND)** program should be implemented. Observational trials have shown that this program can be of help (one such study showed that 9 of 10 people forced to discontinue their work were able to return to their work following institution of this program). Key is early intervention! There are 24 separate steps that compose the MEND program. Not all steps are necessary to the success of the program—some steps are essential and if not done, minimize the gain from the rest. Considering your level of cognitive impairment, your commitment to stopping the progression of decline, and your financial situation, a program for you should be established that will be adhered with over the long haul, utilizing as many of the 24 steps as possible.

Finally, you will necessarily have to read through the entire packet provided to you so you can maximize your gain from this program. If you do not understand any aspect of the program, ask about it. If you are uncomfortable about any aspect of the program, discuss it. If you have factors in your life that will interfere with the implication of the program, make us aware of them.

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Memory Screen

Name: _____ Date: _____

1 = Daily 2 = Regularly 3 = Occasionally 4 = Rarely 5 = Never

Forgetting where you have put something. Losing things around the house.	1	2	3	4	5
Failing to recognize places that you have been before.	1	2	3	4	5
Finding a television story difficult to follow.	1	2	3	4	5
Not remembering a change in your daily routine (following an old routine instead).	1	2	3	4	5
Having to go back and check whether or not something was done that was intended	1	2	3	4	5
Forgetting to take things with you, having to return and fetch them.	1	2	3	4	5
Forgetting that you were told something yesterday or a few days ago.	1	2	3	4	5
Starting to read and not realizing you have already read the material previously.	1	2	3	4	5
Having difficulty picking up a new skill (to play a game, operate a new gadget).	1	2	3	4	5
Finding a word is "on the tip of your tongue", but trouble finding it.	1	2	3	4	5
Forgetting details of what you did or what happened to you the day before.	1	2	3	4	5
When talking to someone, losing your "train-of-thought".	1	2	3	4	5
Unable to follow the thread of a story when reading a newspaper or magazine.	1	2	3	4	5
Getting the details of what someone has told you mixed up and confused.	1	2	3	4	5
Telling someone a story or joke that you have already told them.	1	2	3	4	5
Forgetting details of things you do regularly (home or work).	1	2	3	4	5
Forgetting where things are normally kept/looking for things in the wrong place.	1	2	3	4	5
Getting lost or turning in wrong direction walking or driving.	1	2	3	4	5
Repeating yourself or asking people the same question twice.	1	2	3	4	5
Doing a routine twice by mistake (cooking, grooming, for example).	1	2	3	4	5

Total Score = _____

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Score Range	Your Score	Level of Concern
100		Low Concern
90		
80		Moderate Concern
70		
60		
50		
40		Most Concern
30		
20		
10		
0		

What do you need to do?

- Follow the instructions on the first page and determine your Memory Score level.
- More recent nutritional research is emphasizing the importance of the quality and type of foods consumed more so than counting calories or worrying about serving sizes. Given the known failure rate of the traditional calorie counting diets and their extremely poor track record for long-term success, I urge looking closely at some of the various nutritional plans that are being published emphasizing this point. A summary paper “Anti-Inflammatory Nutrition” is included with this packet, which contains the essentials of this plan.
- You will need to establish a source to obtain the supplements/vitamins you include in your program. Choose a good quality brand and use fewer products if necessary rather than a poor quality brand that is less expensive and using more products. Some good brands are Life Extension, Nordic Naturals, Integrative Pro, and ALCAT, to name a few.
- I have attempted to summarize what the purpose of using anti-inflammatory nutrition is in the handout. If questions arise when you review this, ask and the physician/diet consultant can explain it for you.
- Select from the 24 options that compose the MEND program
 - The first six options should be employed by everyone, for those with normal scores desiring to institute prevention measures through those who are in need of treatment and repair.
 - Basic lab screening tests should be completed by all at the start of the program

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- A complete blood count, basic chemistries, thyroid studies, lipid (blood fat) studies, and urinalysis.
- More specialized studies such as Vitamin D and B12 levels, homocysteine, a fasting insulin level, a hemoglobin A1c, zinc and free copper levels, and a heavy metal screening panel are sometimes indicated.
- Results of these screening tests will determine if it is necessary to select treatment options from steps 7, 8, 9, 14, 18, and 23
- One further test, discussed in the Anti-Inflammatory Nutrition section, that is of prime importance is determining the Arachidonic Acid (AA) : Eicosapentaenoic Acid (EPA) ratio. An in-home test is available for a fee that substitutes for this lab test called the *Holman Omega-3 Test* (www.lipidlab.com).
- Depending upon the laboratory outcomes, supplement and nutritional improvements can be recommended.
- Steps 10, 11, 17, 19, 20, and 24 are advisable for both prevention and treatment
 - Several options are offered at each step—whereas prevention would require the choice of only one or two of the options offered, the more serious the impairment, the more products from each step should be considered.
 - Economics do play a role in selecting products as some supplements are much more expensive than others and the number of products that may be indicated may increase to the point of being a financial burden.
- The remaining steps of the MEND program should be considered and utilized dependent upon the severity of the presenting cognitive impairment.
- Two supplements that are very useful to include in any program for neurologic issues are curcumin and Hemp Oil.
- The key component of the entire program is the first option offered, “Optimize the Diet”. Without adequate attention to this aspect of the program, the rest of the program will be markedly reduced in effectiveness.
 - The average American diet is much too high in omega-6 free fatty acids and too low in omega-3 free fatty acids—your starting point in this regard is established when the previously mentioned blood test for the AA : EPA ratio is available for review.
 - The goal is to have an AA : EPA ratio between 1.5 and 3.0—this necessitates an alteration of the usual American diet to consume more omega-3 fats, less omega-6 fats. This can best be accomplished by:
 - Emphasizing non-starchy vegetables and moderating fruit intake (brightly colored vegetables and fruits should be emphasized and broccoli, kale, and berries are all particularly helpful)—carbohydrates should compose about 40% of Caloric intake.
 - Soluble grain fiber (oats and whole wheat and/or barley—quinoa is particularly good)—part of the 40% carbohydrate intake. Diabetics and those with Metabolic Syndrome should seriously restrict breads, wheat cereals, and potatoes.
 - High quality, lean, grass fed beef or poultry—proteins should compose about 30% of Caloric intake.
 - Salmon or large-mouth fish such as tuna, bass, and swordfish (preferably oily fish) should make up two meals per week—part of the 30% protein intake.

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- Proper fat selection such as mono-unsaturated fats (extra virgin olive oil, about one tsp. daily), walnut oil, canola oil, coconut oil, hemp oil (particularly good)—healthy fats should compose about 30% of Caloric intake.
- If diet alone does not produce the desired AA : EPA ratio of 1.5-3.0, supplemental EPA and DHA through fish oil supplementation should be added (usually about 2.5-3.0 grams [2500-3000mg] per day; can safely use up to EPA + DHA = 5.0 grams daily, EPA up to 1.8 grams [1800mg] daily, DHA should be a minimum 1.0 gram [1000mg] daily).
 - Must seek out a high quality, purified version that guarantees a very low contamination level (manufacturer should guarantee this).
 - Should also be in the triglyceride form.
- If further attention is needed to lower the AA : EPA ratio, polyphenols 500 – 1000 mg per day can be added as a supplement if necessary.
- If fish (preferably oily fish) are going to be consumed to help attain the desired AA : EPA ratio, one must be aware of the potential of mercury intoxication.
 - Two meals per week will usually present no problem. However, be sure to establish your personal level of RBC mercury prior to initiating a diet containing more fish meals than you are accustomed to or if you are already ingesting more than 2 meals per week.
 - If you are planning on consuming more than two fish meals per week, bring this to your physician's attention and regularly monitor your mercury level (elevated mercury levels above 11 will nullify any gain garnered from an Anti-Inflammatory Diet).
 - Omega -3 fats, EPA and DHA, may be substituted for fish completely if desired but follow guidelines suggested above when deciding which product to purchase.
- An excellent reference (there are numerous others) regarding the composition of an Anti-Inflammatory Diet that is written for lay consumption is called "**The Zone Diet**". It is a useful reference book to keep on hand.

Another thought to take note of: DHA is the most abundant omega-3 fatty acid found in the brain. However, the positive results of DHA supplementation discussed above may be limited to those who are apoE4 negative (can be determined by a blood test). The MIDAS study, however, did demonstrate significant improvement in cognition after 24 weeks of supplementation.

Metabolic Enhancement for NeuroDegeneration (MEND)

1. Optimize the diet

- a. Minimize simple carbohydrates (simple sugars, sweets, etc.)
- b. Emphasize low glycemic foods (vegetables and moderate fruit—berries preferred)
- c. Select grain products (minimize wheat, emphasize oats—Quinoa superb)
- d. Adequate daily fiber (viscous [soluble] type) 30 grams daily
 - i. Beta-glucan (oats, whole grain wheat/barley) 3 grams daily
 - ii. Pectin (apples, citrus)
 - iii. Guar Gum Powder 12-15 gm daily
 - iv. Mucilage (Psyllium—Metamucil or the like)

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- e. Implement low inflammation nutrition* (Zone Diet a great example—Mediterranean and DASH acceptable but watch total carbohydrate intake, Weight Watchers good)
 - i. 40% of daily Calories as low-glycemic-load carbohydrates (non-starchy vegetables and limited amounts of fruit)
 - ii. 30% of daily Calories as low-fat protein
 - iii. 30% of daily Calories as fat, high in monounsaturated fats and omega-3 fatty acids, low in omega-6 and saturated fatty acids (good fats)
 - iv. If gluten sensitivity an issue, use gluten free diet (quinoa and oats are gluten free)

***See separate paper regarding what constitutes low Inflammation Nutrition (such nutrition necessarily encompasses the preceding three points if done properly)**

2. Ketogenesis

- a. No food after evening meal for 3 hours prior to retiring to bed
- b. No food for at least 12 hours after last food of one day and first food of the next day
- c. Not intended for type 1 Diabetics

3. Reduce Stress

- a. Quiet, relaxing time for 10-20 minutes each day
- b. Prayer, yoga, music, nature, etc.

4. Optimize Sleep

- a. Minimum 8 hours per night
- b. Melatonin 0.5mg hs, daily
- c. Tryptophan 500mg, MWF (if awakening during the night)
- d. Exclude sleep apnea if considered a possibility

5. Exercise

- a. 30-60 minutes per day
- b. 5-6 days a week (frequency is essential to success)
- c. Walking 2.5-3.5 MPH on a flat surface or the equivalent exertion in some other form
- d. Exercise should always be introduced gradually with the preceding goals in mind
- e. Do not persist with exercise if doing such makes you feel badly in any way
- f. Doing more or less than the above prescribed amount of exercise is a negative for *overall* health

6. Brain Stimulation

- a. Puzzles or the like
- b. Hobbies

7. Homocysteine <7 (Blood Test)

- a. Methylcobalamine, 1mg, daily
- b. Methyltetrahydrofolate, 0.8mg, daily
- c. Pyridoxine-5-phosphate, 50mg, daily
- d. Trimethylglycine (if necessary*)

***Use only the number of the four supplements offered necessary to reach the stated goal**

8. Vitamin B₁₂ >500 (Blood Test)

- a. Methylcobalamine, 1mg, daily

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9. Fasting Insulin <7; A1c <5.5 (Blood Test)

- a. Diet (see #1 above)
- b. **Not** intended for a type 1 Diabetic (consult with physician)
- c. Stated goals may not be desirable for all type 2 Diabetics (consult with physician)
- d. Appropriate medications often necessary, taken after consultation with a physician

10. Calcium Binding Protein

- a. Apoaequorin (Prevagen) 10-20 mg daily

11. GI Health

- a. Prebiotics
 - i. Fructo-oligosaccharides (FOS)
 - ii. Oat fiber, garlic, onions, honey, and tomatoes
- b. Probiotics
 - i. Solid evidence regarding specific probiotic species is lacking
 - ii. A prescription probiotic, VSL#3, is available and has demonstrated effectiveness for inflammatory and irritable bowel disorders

12. Reduction of Beta Amyloid (at least one)

- a. Curcumin (turmeric) 400 mg, daily
- b. Ashwagandha 500 mg, daily
- c. Bacopa monniera 250 mg, daily

13. Cognitive Enhancement

- a. Bacopa monniera 250 mg, daily
- b. Magnesium threonate, label dosage

14. Vitamin D 50-100ng/mL (Blood Test)

- a. Lab test helpful to determine current level
- b. Most Michiganders fall in the 4000-5000 mg daily range
- c. Supplement to obtain goal
 - i. 50,000 units to correct rapidly
 - ii. Maintenance 1000-5000 units, daily

15. Increase NGF (Nerve Growth Factor)

- a. H. erinaceus (lion's mane) 1000 mg, three times daily
- b. Acetyl-L-Carnitine (ALCAR) 500 mg, 1-2 caps daily

16. Provide synaptic structural components

- a. Citicoline 500 mg, bid
- b. DHA 320mg/EPA 180 mg, daily

17. Optimize antioxidants

- a. Mixed tocopherols and tocotrienols (Vitamin E) 400 I.U. daily
- b. Selenium 200 mcgm, daily
- c. Blueberries
- d. N-acetyl cysteine 600-2000 mg, daily
- e. Ascorbate 1 gram, daily
- f. Alpha lipoic acid 100 mg, daily

18. Optimize Zinc:Cu ratio (Blood Test)

- a. Ideal 8:1

19. Ensure night time oxygenation (exclude or treat sleep apnea if indicated)

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20. Optimize Mitochondrial Function

- a. CoQ-10 200mg, daily (particularly if on a statin medication)
- b. Alpha lipoic acid 100mg, daily (strongly recommended)
- c. Polyquinoline quinone (PQQ) 20mg, daily
- d. N-acetyl cysteine 600-2000 mg, daily
- e. Acetyl-L-Carnitine 500mg, 1-2 caps daily
- f. Selenium 200 mcgm, daily
- g. Zinc picolinate 50 mg, daily
- h. Resveratrol (dark red grape skins—supplements available)
- i. Ascorbate 1 gram, daily
- j. Thiamine

21. Increase Focus

- a. Pantothenic Acid 500 mg, 1 daily

22. Increase SirT1 function

- a. Resveratrol (dark red grape skins—supplements available)

23. Exclude Heavy Metal Intoxication (Blood Test)

- a. Mercury (absolute maximum 15, better under 11, best under 7)
- b. Lead
- c. Cadmium

24. Medium Chain Triglyceride Effects

- a. Coconut Oil 1 tsp, bid

A Final Word Regarding Adequate Treatment of Risk Factors/Metabolic Disorders

Anti-Inflammatory Nutrition is helpful for numerous medical conditions, including central nervous system disorders, cardiovascular disorders, maternal and offspring health, cancer, inflammatory disorders, and psychiatric problems. It can help lower blood pressure, improve lipids, improve diabetic control and help with weight loss. However, one must not make the mistake of assuming that following the MEND program or any other Anti-Inflammatory Nutritional Program will resolve and adequately control all cases, just as one should not assume that merely taking medications will resolve all of one's medical issues. The best approach is to initiate and maintain as complete and comprehensive nutritional program as one possibly can, monitor one's progress as outlined preceding (AA : EPA, TG : HDL, and HbA1c), and, *if not at desired goals for optimal health*, use appropriate medications readily available today to achieve those desired goals. Medications are available that are amazingly effective and safe—the gain : risk ratio is powerfully in favor of health gain and should be incorporated into one's program for overall good health if they are needed. Just as with any Anti-Inflammatory nutritional plan, follow-up with your provider for monitoring of effectiveness and safety is equally important as for the use of medications.