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Background & Purpose

Pre-clinical research suggests that good nutrition, and certain dietary programs may reduce risk, or slow, cognitive decline, and improve general quality of life. Recent longitudinal studies suggest that multiple whole foods are more protective than single foods or nutrients. Using all available brain health related evidence, Dr. Emerson Lombardo's interdisciplinary team designed a whole foods Memory Preservation Nutrition® (MPN) program emphasizing synergistic contributions to brain health of increasing Omega-3s, foods with anti-oxidants, anti-inflammatory properties, which attenuate insulin resistance, and/or which reduce amounts or oxidation of LDL cholesterol, as well as foods rich in B vitamins. Studies suggest nutrients can interfere with mechanisms thought to affect etiology of AD - impaired brain cell membrane repair and function, insulin resistance, microgliosis, inflammation, mitochondrial damage, impaired blood flow, oxidative damage, and excess beta-amyloid (AB) or NFTs characteristic of AD.



MEMORY PRESERVATION NUTRITION® - Multiple Nutrition Strategies Using WHOLE FOODS © 2010

Objective

To implement the MPN brain health intervention model in real life older adult residential settings serving group meals, and to assess the program's feasibility, and acceptability. Special attention would be paid to residents with MCI and AD and other cognitive impairments, but the goal is to promote brain and body health of all residents.



Baskets of brain healthy foods

Methods

A real world clinical intervention has been implemented which includes training and educational sessions with all facility/community staff (not just culinary and wait staff), and with residents, families, and referral sources. The program includes assessment of current practices and preferences; then consultation about how to change these practices, in doable steps and phased in stages, to achieve a brain healthy, delicious nutrition program following the Memory Preservation Nutrition® protocol. Methods used include coaching and empowerment models, and monitoring of progress. Quality Assurance includes pantry and purchase reviews, meal testing and observation, interviews with staff and residents.

Location: 6 Assisted Living communities managed by Senior Living Residences, LLC in the Boston, MA area



- 1) increase** amount & variety of anti-oxidants including spices, vegetables, fruits, nuts & seeds; include green leafy vegetables, berries, whole grains, vegetable & fruit juices & tea.



- 2) assure adequate** B, D & E vitamins especially B12 & niacin. Beware excess B6, folate. Vit E should be comprised of all 8 tocopherols & tocotrienols, from nature. Supplement with vitamin D3.

- 3) increase** Omega-3's - eat fish, fish oil, canola oil, flax seed, green vegetables; **decrease** Omega 6's-no corn oil; use olive oil



purslane

- 4) reduce** inflammation. (Omega 3's, anti-inflammatory spices & herbs, berries, purple grapes & juice, green vegetables and green tea)



- 5) reduce** insulin resistance- reduce sugar and sugary soda & sweet drinks. Eat complex carbs & whole grains, green tea, cinnamon, turmeric & certain other spices , omega 3's & more vegetables.

- 6) reduce** LDL cholesterol and saturated fats. Avoid Trans Fats. (e.g. eat nuts, oatmeal, grapefruit, purple grapes, niacin, fiber, fish oil & niacin & spices to reduce LDLs and anti-oxidants to reduce oxidation of problem cholesterol)

Brain Healthy Nutrition for Assisted Living & Older Adult Meals

The Memory Preservation Nutrition® program has been brought successfully to Assisted Living facilities in New England

- Two keys to facilitating changes
- 1) Knowing both **what** to do and **how** to do it,
 - Use a team approach.
 - Phased approach - taking into account situational features
 - Combination of both visible and subtle changes
 - 2) Bringing in a Brain Health expert to teach **everyone**
 - Importance of making these changes
 - How to best go about making them.

Written Materials and Guidelines
Troubleshoot and overcome all challenges

- Multi-faceted approach, work with everyone in the House - "soup to nuts".
- Raise awareness and education (how nutrition improves brain and body health)
- Corporate level: Owners, board of directors, corporate chef (if any) & Memory Care, meet government regulations
- Facility level: Work with the ED, Memory Care Director & Executive team to plan schedules, customize plan, coordinate & troubleshoot. Review budget considerations.
- Meet with nursing and other clinical staff. Assess medical conditions relevant to dietary requirements and changes. Periodic feedback.
- Interface with facility dietician.

Practical Considerations

- Changing nutritional program in residential communities should be comprehensive .
- Recognize how change is brought about in complex organizations
- Know how to get "buy-in" from all concerned.
- Each community is different, thus tailor the program or implementation method to fit.
- Implementation is a PROCESS - PHASE IN
 - does not, should not (for residents' sake) happen overnight, (could cause gastric upset, medication surprises)
 - Phased Program also easier for food services.
 - Allow for feedback and adjustments.

Results:

Preliminary results (after 18-30 months in 5 residences) suggest feasibility and good acceptance of this model nutritional program in assisted living communities, with changes in basic ingredients, menus and recipes, as well as some dining practices, and snacks provided to generally refresher educational sessions and quality assurance checks are necessary to maintain adherence by staff (and residents). Multiple year contracts have been necessary to maintain adherence through staff changes. Staff and referring providers appear eager to learn better nutrition for themselves, not just their clients, reflecting growing awareness about how nutrition affects brain and body health.

No reported adverse effects. Older adults DO accept most changes. Among the changes successfully implemented are 1) increased use of spices by both residents and cooks, e.g. shakers of both cinnamon and mixed green spices (no salt) placed on every dining room table 2) increased vegetables used in menus and recipes, e.g. two vegetables on the plate of largest meal of the day and in recipes. 3) removal from pantry of foodstuffs containing high %'s of sodium, sugar/HFCS, and almost all transfats. 4) encouragement to do more cooking from scratch and use fewer processed entrees and desserts. 5) movement toward 100% fruit juices and addition of low sodium vegetable juices.6) healthier snacks for residents in memory impaired units 7) more whole grains 8) healthier desserts although this remains as one of biggest challenges.

Conclusions

Some of the MPN program nutrients recommended for cognitive aspects of brain health are also potent treatments for other aspects of brain and body health. As the evidence mounts whole food nutritional interventions to promote brain health both for primary and secondary prevention will become mainstream treatment options, for individuals as well as in group settings. Future effectiveness and efficacy studies of whole food interventions for brain health are needed.

MPN™ © 2005 Conceptual Model:

Nutrition Intervention

A. Nutritional Program

1. Antioxidants-variety
 2. Sufficient B,D & E-Vitamins
- Foods & spices which reduce
3. Omega 6/Omega-3 ratio
 4. Insulin resistance
 5. Inflammation
 6. LDL cholesterol

Nuts, seeds; fish; whole & juiced vegetables & fruits, esp. green leafy & berries; soy beans & products, green tea; omega-3 and vitamin supplements; spices e.g. turmeric, ginger & cinnamon

B. Behavior Change Program

Biological Outcomes

Reduced Oxidative Stress (8,12-iso-IPF2a-VI)

DNA damage - 8OH2'dG

Reduced Inflammation (C-Reactive Protein, IL-6)

Reduced insulin resistance, insulinemia & glucose imbalances

Increased blood levels of vitamins C,E, folates, Omega-3's esp. DHA, HDL cholesterol;

Reduced Homocysteine and LDL Cholesterol

Neuropsych Outcomes

Cognition

Behavioral Symptoms

QOL

•Improved vascular function
•Improved brain cell membrane, synaptic function, communication, & repair; microtubular & mitochondrial health & function, improved microglia, metal ion homeostasis & insulin & other cell signaling
•Improved anti-oxidant action & energy utilization
•Decreased phosphorylation of tau and reduced a-beta 42