

Mild Cognitive Impairment (MCI)

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Purpose of Session: Mild Cognitive Impairment (MCI)

The following session on Mild Cognitive Impairment (MCI) briefly describes signs of a mild thinking decline involving primarily short-term memory problem and strategies for management.

Mild Cognitive Impairment (MCI)

When people are very tired (worn-out), trying to handle too many tasks at once or stressed, they may have occasional difficulty with short-term memory. Some call this a "senior moment".

The short-term memory loss may be greater than what is normal for that person. It may be greater than we would expect when compared to the memory of others the same age and who completed the same amount of education. If the memory loss is subtle but still noticeable to the person experiencing the memory problem as well as to a significant other (who knows the person well), the person may have a *mild cognitive impairment* (often called **MCI**, for short).

The short-term memory loss of someone with a *mild cognitive impairment* is ongoing. They may have trouble misplacing things at the office or at home. The short-term memory loss may occasionally begin to interfere with the ability to keep up with complicated daily tasks at work or at home although the person is typically able to keep up normal daily activities and relationships. If there are no other thinking difficulties such as trouble recalling words when speaking, then the person with ongoing short-term memory problems may be suffering from *mild cognitive impairment*.

Mild Cognitive Impairment is the diagnosis given to people who show only a short-term memory loss and no other decline in thinking functions that can be measured objectively in a medical evaluation.

Sometimes people with *Mild Cognitive Impairment* may also have very mild episodes when they cannot recall specific names during conversations. They may have other occasional mild thinking difficulties such as keeping up with the details of many topics that come up when several people are talking at a large meeting. Or, they may have trouble managing complicated tasks such as preparing the annual income taxes. They may begin to struggle when handling all the tasks and following up people's specific assignments of a complicated project. For example, leading the annual fund raiser for their volunteer organization, though previously fun and easy to oversee, now may become too overwhelming for them. Generally speaking, however, people with Mild Cognitive Impairment manage their paid job, home duties and relationships just fine.^{1,2}

Various Names of Mild Cognitive Impairment

Mild cognitive impairment has been called *questionable dementia*, an *isolated short-term memory loss*, an *amnestic dementia*, a *mild neuropsychological decline*, *possible or probable Alzheimer's disease*, and many other terms. More recently, the term *Mild Cognitive Impairment* (often shortened to *MCI*) seems to have gained popular use in medical, research and educational use.³⁻⁷

Some physicians use specific categories of MCI. For example, the term *Amnestic MCI* may apply to only the presence of a short-term memory disorder and no other cognitive (thinking skills) deficits. Some physicians will use the term *Nonamnestic MCI* to indicate that the memory is normal but that there is a problem with another thinking function such as recalling words. Or, *Nonamnestic MCI* may refer to a problem in concentration, such as being so easily distracted by a sight, a sound or a fleeting thought that it is difficult to focus attention on any task or conversation. Another category is *Multiple-Domain MCI* when there are a few areas of thinking skills (such as language, disorientation to time or place, and good judgment) that are impaired.^{1,2}

For the purposes of the information presented in this session, the term *Mild Cognitive Impairment* or *MCI* is used and it refers to someone who has a decline in short-term memory and is otherwise functioning at whatever levels are normal for them.

Mild Cognitive Impairment: Signs^{1,8}

- ➔ Problems with short-term memory
- ➔ Mental status testing shows short-term memory decline
- ➔ Other thinking functions: normal (occasional difficulties but usually normal)
- ➔ Daily activities and duties (at work and home): normal (may need occasional help with some complicated or multi-step tasks)
- ➔ Personal care (personal hygiene, dressing self, etc.): normal



MCI: Medical evaluation shows short-term memory decline, normal mental status and normal functioning in the person's daily routine.

Brain Cell Changes

Located in the area of the brain just above the ears is the hippocampus. The hippocampus is part of the entorhinal cortex. Early brain cell changes in the hippocampus (or entorhinal cortex) can interfere with memory ability. Next to the entorhinal cortex and nearer the middle area of the brain is the inferior parietal lobe. Early brain cell changes in the hippocampus and inferior parietal lobe may lead to significant problems with the ability of the memory system to use and store information. However, the decline may affect only short-term memory.⁹

In some cases MRI (magnetic resonance imaging) pictures of the actual brain may show decreased brain cells in these areas of the brain. An MRI or other type of brain imaging process showing decreased brain cells or decreased brain cell activity in these areas of the brain. Such findings in a person already diagnosed with Mild Cognitive Impairment may indicate that the person has had more decline and progressed to a diagnosis of a progressive memory disorder such as Alzheimer's disease or a related dementia.⁹

Importance of Short-term Memory

Short-term memory and thinking functions are important for keeping up with all the responsibilities, relationships and activities in ones daily life. Short-term memory is important for holding new information including details, such as who, what, when, and where. It is important to hold pieces of information for current work such as adding up numbers and then storing the information for later use.

A decline in short-term memory may lead to some difficulty in keeping up with all the points in a conversation or managing complex events that need moment-to-moment tracking such as running a business or organizing a class or family reunion. A person must be able to remember information that was just heard or seen a few minutes ago and even a longer than that in order to function well and to function safely. For example, remembering a sign directing you to the correct section of a department store will help you find the items you need. Remembering a street sign about a detour or fallen rocks on the road ahead is important for safe driving. A person must be able to remember all the steps just read in a set of directions in order to replace a battery in a new radio, camera, or child's toy.

Importance of Early Medical Exam

When the symptoms such as problems with memory first appear, an early medical evaluation is important. With more than 5 million people in the United States estimated to have Alzheimer's disease or a related dementia expected to reach more than 16 million or more people by 2050¹⁰⁻¹⁴, treating a memory disorder early and maintaining self-sufficiency longer represents enormous savings of money, time and energy to families.

Currently, there are an estimated 8 million people in the U.S. with Mild Cognitive Impairment.^{5,15} Although there are no predictions of how many people will have MCI in 2030 or 2050, with the increased longevity of people and the significant numbers of MCI cases that progress to Alzheimer's disease or a related dementia, there definitely will be an increasing impact from MCI on society, particularly the increase of burden and costs to family caregivers. Thus, if early memory decline can be treated, slowed down, reversed or prevented, the benefit to society and families will be enormous.^{1,8}

Some research has found that some people with mild memory or other thinking difficulties will return to their normal functioning (normal for their age, education, and occupation levels) when evaluated a year or more later.¹⁵⁻¹⁷ Reasons for the memory problems may have been due to depression, high anxiety, high amounts of stress, having a mild infection that temporarily impaired memory, fatigue, or some other health, environmental or relationship condition. When these health conditions were treated and circumstances improved, the memory ability returned to normal levels of functioning.

Some people will maintain the short-term memory difficulties and stay at that level of decline with no further changes in their memory or other thinking functions. Others, despite their best and healthiest efforts, seem to convert over time to slow, progressive declines in memory and other thinking functions. Based on studies of brain tissue at autopsy some of these cases have changed to the point of developing Alzheimer's disease or other related types of progressive dementia such as vascular dementia, frontotemporal lobar degeneration or a mixture of dementias.^{8,16,18-20}

Some studies estimate that 10% to 15% of people with Mild Cognitive Impairment will progress to Alzheimer's disease in one year. Other research suggests that changes to progressive dementia occur in three years or more. Researchers have found that up to 40%¹⁵ and even as many as 65% of people^{18,21} with Mild Cognitive Impairment will progress to Alzheimer's disease or a related progressive dementia. This change over to Alzheimer's disease or a related dementia appears to occur especially in those who in addition to the Mild Cognitive Impairment occasionally have other mild problems with disorientation, anomia (difficulty recalling specific names or words) or decision-making.²²⁻²⁵

Medical Evaluation

Both the person with the memory problem and someone (or more) who knows that person well should attend the clinical appointment for the medical evaluation. Sometimes additional family members or friends will come to the clinical appointment. An early medical evaluation should include a medical and surgical history, a medical exam, a neurological exam, a psychological exam (including a screening for depression and anxiety) and a mental status exam [a neuropsychological evaluation of cognitive (thinking skills) and memory functions]. Questions will cover medicines, vitamins, minerals, herbs, and other supplements taken daily and occasionally, alcohol intake, tobacco use, and the medical history of directly-related family members such as parents and siblings. Laboratory tests looking at blood and urine and, typically, an MRI are important.

The clinical evaluation may uncover a simple health problem that is easy to fix. For example, low levels of thyroid hormone, Vitamin B12 or other B Vitamins will lead to problems with short-term memory. Some medicines important for heart conditions, allergies, pain, or urine incontinence may interfere with memory function.

If the health problems leading to the short-term memory loss have been going on for a short time, such as 6 months, fixing the health problems may return the memory function to normal levels though it may take several months for that recovery to occur. If the health problems have been going on for more than a year, fixing the health problems may improve short-term memory function but may not return it to the previous, normal level.

Healthy Lifestyle

With a healthy lifestyle many people may be able to improve memory function, maintain the current level of memory function, or slow down progressive decline. A healthy lifestyle includes good nutrition, drinking 8 to 10 glasses of water a day unless a physician limits liquid intake, daily physical exercise, daily brain exercise such as doing crossword puzzles, reading and discussing the reading material, visiting with friends, doing tasks, working on enjoyable projects, developing leisure activities, trying to learn something new every day, playing a musical instrument, listening to music with or without lyrics (words), doing or enjoying art, taking photographs, looking at photo albums and remembering the details of the pictures and people. These various types of activities keep the brain cells stimulated. The activities help to expand the reserve of brain cell connections and increase the chances of the brain functioning better and longer.

Basics of Keeping the Brain Healthy⁵

1. Good nutrition; grains, fresh fruits and vegetables every day
2. 8 to 10 glasses of water a day unless a physician limits liquid intake
3. Daily physical exercise for at least 20 minutes at a time and at least 5 days a week
4. Daily brain exercise: crossword puzzles, jigsaw puzzles, math puzzles (sudoku), etc.
5. Daily fun activities
6. Follow your physician's advice to take care of your health

Also Important for Brain Health⁵

1. Read and discuss the reading material with someone or with a group of friends
2. Visit with friends whom you enjoy
3. Follow a daily routine with some variety to increase interest
4. Work on enjoyable projects
5. Learn something new every day: start a new leisure activity or project; make a new friend
6. Play or listen to music [with or without lyrics (words)]; play a musical instrument
7. Do art or look at art: take photographs, look at photo albums and remember the details of the pictures and people; look at paintings and discuss them
8. Go outside every day the weather permits
9. Touch a plant, tree or flower blossom every day (indoors or outdoors)
10. Make friends with people your age, older than you and younger than you
11. Reduce stress
12. Do relaxation exercise
13. Do something for someone else every day
14. Strengthen yourself spiritually

Medical Follow-Up

Some recommendations for therapy for a diagnosis of Mild Cognitive Impairment may improve memory function and slow the rate of decline that is occurring. There are no clear, strong studies that show that the medicines (anticholinesterase medicines such as aricept©, exelon© or razadyne©, or the neuron protectives such as ginkgo biloba or namenda©) used to try to improve functioning in people with Alzheimer's disease are useful for people who have MCI, yet some physicians may recommend such medicines to see if they may be of any help.

To determine if decline is ongoing and if safety is a concern, people with Mild Cognitive Impairment should undergo a medical check-up every three to six months with the physician. If medical findings suggest an ongoing decline in memory, in other thinking functions such as planning an activity involving several details and steps, and in other learned skills such as how to use tools, then the physician may recommend appropriate limits on these activities.

Mild Cognitive Impairment and Driving

At the point of beginning decline, the person with Mild Cognitive Impairment probably still is fully safe as a driver of motor vehicles or able to handle complicated machinery. However, early planning for changing mobility needs should involve choices for transportation alternatives for the future when there may be a change in the ability to drive. Many people outlive their ability to be safe drivers. Many people outlive their ability to have a good, healthy normal memory. These changes mean that people may need other sources of transportation to access resources and relationships in order to keep functioning well on a daily basis.

Any reports from the person or the family (or significant other) that driver safety is a concern should come to the attention of the physician or other health professional, who is following up the general health care of the person. The physician or health professional may recommend that the person take a comprehensive driver evaluation test before continuing to drive. Often a driver refresher course, training with a driver safety specialist to update skills, or adding features to the car, such as a wider rear-view mirror or larger side-view mirrors, may be all that are needed to eliminate risks as a driver.

Note that: a *comprehensive (full) driver evaluation* is more extensive than the regular driver test of the Department of Motor Vehicles and Highway Safety. The comprehensive driver evaluation test involves different vision tests, tests of memory and cognitive functions as well as an on-the-road test (some places use a virtual test, an indoor set-up that was designed to imitate on-the-road driving situations).

A *driver safety specialist* who is certified in comprehensive driver evaluation is trained in assessment and may offer some “driver rehab”. Some of these specialists are occupational therapists; others have different training. Further information is available at the web site of www.AlzOnline.net in the link to *Series: Driving and Progressive Dementia, Session 2: Safe Driving and Mild Cognitive Impairment*.²⁸

Planning Ahead

Besides early intervention to stop or slow down memory and cognitive decline, another value of early medical evaluation is the ability to plan ahead of time for future lifestyle adjustments. Early on, assistance from experts in retirement planning may help people establish priorities, plan steps to fulfill dreams such as traveling, taking educational workshops or courses, write down stories describing the history of the family, refinish worn out furniture, or learn a new hobby or sport.

Early planning should consider legal, financial, and possible needs for the long-term, such as skilled health care preferences especially in the event of a health crisis. The planning should consider housing alternatives as preferences and lifestyle needs change, for example, some communities-for-a-lifetime offer quality settings and a continuum of services. The costs may range from reasonable to expensive. The choices for long-term housing should consider the flexibility of contracts and the ability to change a residence without devastating financial losses to the family.

Other issues to consider are accessing resources for the family to provide life enrichment and to lessen caregiver burden over the long-term.

TIPS FOR MEMORY LOSS

Persons with memory loss should try to work within the range of their ability. Sometimes the memory loss is limited to problems with short-term memory. On occasion there may be mild difficulty recalling specific names of people, places, or objects.

Earlier is Better Than Later

The ability to remember may be better during the morning. When the person is tired at the end of the day, the short-term memory may be less reliable. For this reason, any appointments that involve careful thinking, remembering many details, and important decisions should occur early in the day. Financial or legal discussions and other important decisions should occur when the person is rested, clear-thinking and alert.²⁸ Helps include: planning ahead, allowing enough time for tasks or appointments, making the home, work, or leisure setting easy for daily functions and a variety of activities. It is helpful for the family members or significant others to stay as positive as possible. Being pleasant, patient, and sensitive to preferences in providing assistance helps the person with a Mild Cognitive Impairment to maintain a sense of being valued, self-sufficient, independent, and an important contributor to the activities in the workplace and at home.²⁸

TIPS for Someone with MCI

1. Use reminder notes, a calendar, an appointment ipod or other tool. Keep reminder notes together, in one place.
2. Keep paper and pen/pencil handy. When you think about it, write it down. Write down: ideas, passing thoughts, tasks to do, people to call...
3. Work at paying attention. Watch, listen; focus. Make eye contact with the speaker.
4. Repeat information out loud and a few times quietly to yourself.
5. Do one thing (and one step) at a time.
6. Stay on a routine. Do it (or go) the way you know.
7. Keep handy simple directions (and a small, simple map) to different places and the easiest way back home again.
8. Keep handy: names and phone numbers of people who can help you or whom you are going to visit.

Tips for People Assisting Others Who Have MCI

1. Keep activities simple, one step at a time. Schedule rest times for them and for you.
2. Discuss specifics and use the actual names of people, pets, places, time, etc.
3. Encourage, not push nor nag.
4. Repeat the question or request in a pleasant tone or voice.
5. Allow enough time for tasks and appointments.
6. Do tasks slowly, step by step.
7. Do activities together, such as paying bills, yard work, or washing the dog. Act as a team.

CAREGIVERS OF PEOPLE WITH MEMORY LOSS – PLEASE REMEMBER TO:

1. Call the person by name. Use eye to eye contact, a smile and stay relaxed.
2. Show and tell the person the time, the date, the next step or activity.
3. Hang a large calendar. Keep the daily schedule handy and follow it. Mark off yesterday, finished activities and past appointments. Keep that page or list to refer back to.
4. Post a sign or picture to note special activities.
5. When talking, use specifics and repeat the details.
6. Keep the person up to date. Discuss:
 - **special events*
 - **community & world news*
 - **recipes*
 - **t.v. and radio shows*
 - **family activities*
 - **sports*
 - **upcoming holidays*
 - **upcoming birthdays*
 - **visitors*
7. Encourage the use of simple, fun games, like cards, checkers, puzzles.
8. Schedule daily exercise; walks, golf, swimming, yard work, dancing, etc.
9. Use extra light, not glaring light; use a constant night light.

Summary

When a person experiences subtle ongoing changes in memory ability that also may be noticed by family members or a significant others, a medical evaluation is important. The physician may uncover fixable causes of the decline in memory and provide recommendations such as changing medicine, giving thyroid replacement medicine, or treating an infection. These recommendations may lead the person back to full memory functioning.

The medical evaluation may result in a diagnosis of ***Mild Cognitive Impairment (MCI)*** which indicates that there is reduced short-term memory ability but otherwise the person is functioning at normal levels. Healthful changes in lifestyle such as good nutrition, drinking plenty of water every day, daily physical exercise, daily brain exercise, and reducing stress may lead to better memory function or may help to avoid further decline in memory. Some people who have Mild Cognitive Impairment do change over to develop a progressive dementia such as Alzheimer's disease; others do not. Careful medical monitoring, developing ways to deal with the memory problems and planning ahead for lifestyle changes will help people deal most effectively with the condition over the long term.

This ends the session on ***Mild Cognitive Impairment***. Further information is available in the following tables listing resources.

National Resources

1. AlzOnline (866)260-2466 www.AlzOnline.net
2. Alzheimer's Association (800)272-3900 www.alz.org
3. ElderLocator (800)677-1116 www.eldercare.gov

Florida Resources: Florida Department of Elder Affairs (DOEA)

1. Florida Elder Helpline (800) 963-5337
2. Florida DOEA (850) 414-2000

References

1. Petersen, R.C., Doody, R., Kurz, A., Mohs, R.C., Morris, J.C., Rabins, P.V., Ritchie, K., Rossor, M., Thal, L., & Winblad, B. (2001). Current concepts in mild cognitive impairment. *Archives of Neurology*, 58(12), 1985-1992.
2. Portet, F., Ousset, P.J, Visser, P.J., Frisoni, G.B., Nobili, F., Scheltens, P.H, Vellas, B., Touchon, J. & MCI Working Group of the European Consortium on Alzheimer's Disease. (EADC) (2006). Mild cognitive impairment (MCI) in medical practice: A critical review of the concept and new diagnostic procedure. Report of the MCI Working Group of the European Consortium on Alzheimer's Disease. *Journal of Neurology, Neurosurgery, and Psychiatry*, 77(6), 714-718.
3. Bond, J. & Corner, L. (2006). Mild cognitive impairment. Where does it go from here? *Philosophy, Psychiatry, & Psychology*, 13(1), 29-30.
4. Geda, Y.E., Smith, G.E., Knopman, D.S, Boeve, B.F., Tangalos, E.G., Ivnik, R.J., Mrazek, D.A., Edland, S.D., & Petersen, R.C. (2004). De novo genesis of neuropsychiatric symptoms in mild cognitive impairment (MCI). *International Psychogeriatrics*, 16(1), 51-60.
5. Petersen, R.C. (2000). Mild cognitive impairment or questionable dementia? *Archives of Neurology*, 57(4), 643-644.

6. Petersen, R.C. (2005). Mild cognitive impairment: Useful or not? Alzheimer's and Dementia, 1, 5-10.
7. Petersen, R.C. & Morris, J.C. (2003). Clinical features. In R.C. Petersen's (Ed.) Mild Cognitive Impairment: Aging to Alzheimer's Disease. Oxford, England: Oxford University Press, 15-39.
8. Petersen, R.C., Stevens, J.C., Ganguli, M., Tangalos, E.G., Cummings, J.L., & DeKoskey, S. T. (2001). Practice parameter: Early detection of dementia: Mild cognitive impairment (an evidence-based review). Neurology, 56(9), 1133-1142.
9. Korf, E.S., Wahlund, L.O., Visser, P.J., & Scheltens, P. (2004). Medial temporal lobe atrophy on MRI predicts dementia in patients with mild cognitive impairment. Neurology, 63(1), 94-100.
10. Brookmeyer, R., Gray, S., & Kawas, C. (1998). Projections of Alzheimer's disease in the United States and the public health impact of delaying disease onset. American Journal of Public Health, 88(9), 1337-1342.
11. The Associated Press. Alzheimer's cases up 10% to 5 million in half decade. USA Today, http://www.usatoday.com/news/health/2007-03-20-alzheimers-report_N.htm. (accessed 3/20/07)
12. Evans, DA; Funkenstein, HH; Albert, MS; et al. (1989). Prevalence of Alzheimer's disease in a community population of older persons: Higher than previously reported. Journal of the American Medical Association, 262(18), 2552 – 2556.
13. Hebert, L.E., Scherr, P.A., Bienias, J.L., Bennett, D.A. & Evans, D.A. (2003). Alzheimer disease in the U.S. population: Prevalence estimates using the 2000 Census." Archives of Neurology, 60 (8), 1119 – 1122.
14. Katzman, R. & Fox, P.J. (1999). The world-wide impact of dementia: Projections of prevalence and costs. In Mayeux, R. & Christen, Y. (Eds.). Epidemiology of Alzheimer's Disease: From Gene to Prevention, Heidelberg: Springer-Verlag, 1-17.
15. Daly, E., Zaitchik, D., Copeland, M., Schmahmann, J., Gunther, J. & Albert, M. (2000). Predicting conversion to Alzheimer disease using standardized clinical information. Archives of Neurology, 57(5),675-680.
16. Panza, F., D'Introno, A., Colacicco, A.M., Capurso, C., Del Parigi, A., Caselli, R.J., Pilotto, A., Argentieri, G., Scapicchio, P.L., Scafato, E., Capurso, A., & Solfrizzi, V. (2005). Current epidemiology of mild cognitive impairment and other predementia syndromes. American Journal of Geriatric Psychiatry, 13(8), 633-644.
17. Unverzagt, F.W., Gao, S., Baiyewu, O., Ogunniyi, A.O., Gureje, O., Perkins, A., Emsley, C.L., Dickens, J., Evans, R., Musick, B., Hall, K.S., Hui, S.L. & Hendrie, H.C. (2001). Prevalence of cognitive impairment: data from the Indianapolis Study of Health and Aging. Neurology, 57(9), 1655-1662.
18. Busse, A., Angermeyer, M.C., & Riedel-Heller, S.G. (2006). Progression of mild cognitive impairment to dementia: A challenge to current thinking. The British Journal of Psychiatry, 189(5), 399-404.

19. Jicha, G.A., Parisi, J.E., Dickson, D.W., Johnson, K., Cha, R., Ivnik, R.J., Tangalos, E.G., Boeve, B.F., Knopman, D.S., Braak, H., & Petersen, R.C. (2006). Neuropathologic outcome of mild cognitive impairment following progression to clinical dementia. Archives of Neurology, 63(5), 674-681.
20. Mosconi, L., Perani, D., Sorbi, S., Herholz, K., Nacmias, B., Holthoff, V., Salmon, E., Baron, J.C., DeCristofaro, M.T., Padovani, A., Borroni, B., Franceschi, M., Bracco, L. & Pupi, A. (2004). MCI conversion to dementia and the APOE genotype: A prediction study with FDG-PET. Neurology, 63(12), 2332-2340.
21. Tuokko, H., Frerichs, R., Graham, J., Rockwood, K., Kristjansson, B., Fisk, J., Bergman, H., Kozma, A., McDowell, I. (2003). Five-Year follow-up of cognitive impairment with no dementia. Archives of Neurology, 60(4), 577-582.
22. Boyle, P.A., Wilson, R.S., Aggarwal, N.T., Tang, Y. & Bennett, D. A. (2006). Mild cognitive impairment. Neurology, 67(3), 441-445.
23. Fischer, P., Jungwirth, S., Zehetmayer, S., Weissgram, S., Hoenigschnabl, S., Gelpi, E., Krampla, W., & Tragl, K.H. (2007). Conversion from subtypes of mild cognitive impairment to Alzheimer dementia. Neurology, 68(4), 288-291.
24. Mayo Clinic Staff. (Aug 25, 2006). Mild cognitive impairment. MayoClinic.com. Mayo Foundation for Medical Education and Research. (DS00553)
<http://www.mayoclinic.com/health/mild-cognitive-impairment/DS00553/DSECTION=2>
(accessed 2/28/07)
25. Visser, P.J., Kester, A., Jolles, J., & Verhey, F. (2006). Ten-year risk of dementia in subjects with mild cognitive impairment. Neurology, 67(7), 1201-1207.
26. Small, G.W., Silverman, D.H.S., Siddarth, P., Ercoli, L.M., Miller, K.J., Lavretsky, H., Wright, B.C., Bookheimer, S.Y., Barrio, J.R., & Phelps, M.E. (2006). Effects of a 14-Day healthy longevity lifestyle program on cognition and brain function. American Journal of Geriatric Psychiatry, 14(6), 538-545.
27. Doty, L. (2007). Session 2: Safe driving and mild cognitive impairment. In Doty, L.'s Series: Driving and Progressive Dementia. www.AlzOnline.net. (accessed 3/1/07)
28. Doty, L., Heilman, K.M., Stewart, J.T., Bowers, D., & Gonzalez-Rothi, L.J. (1993). Case management in Alzheimer's disease. Journal of Case Management, 2(4), 129-135.