

What is Neurobics:

Neurobics is a unique new system of brain exercises based on the latest scientific research from leading neurobiology labs around the world. The deceptively simple exercise program is scientifically based on the brain's ability to produce natural growth factors called neurotrophins that help fight off the effects of mental aging. **Neurobic exercises use your five physical senses and your emotional sense in unexpected ways and encourage you to shake up your everyday routines.** Neurobics don't require paper and pen or isolating yourself with puzzles. Everyday life is the neurobic brain gym. They can be done anywhere, anytime in offbeat, fun and easy ways while you're getting up, commuting, working, eating, shopping or relaxing. They are designed to help the brain manufacture its own nutrients that strengthen, preserve and grow brain cells.

Something as simple as closing your eyes and using your other senses of touch, smell and spatial memory to unlock your door, enter your home at the end of the day and find your way to the coat closet and answering machine is a typical neurobic exercise. What happens in your brain while you're doing this becomes exercise because different, underused nerve pathways and connections get activated. The result is the production of a kind of natural brain fertilizer that strengthens nerve connections and helps them and your nerve cell receivers (dendrites) stay younger and stronger. And the benefit of that is a fit and flexible mind ready to meet any mental challenge whether it be remembering a name or where your car keys are or mastering a new computer program or staying creative in your work.

Try these neural building and strengthening exercises with everyday movements.

- Changing the usual smell you wake up to in the morning, i.e. coffee or tea with a different smell or freshly baked bread will activate new neural pathways.
- Use your non-dominant hand to brush teeth, eat food, brush hair or write.
- To use the side of your brain you don't normally use close your eyes to wash, dress, open the front door, find your keys. This will help you strengthen your sense of touch.

- To force you to use your other senses wear ear plugs when completing simple tasks.
- If you use the elevator at work on a regular basis learn Braille for the numbers.
- If you have photographs or pictures on or around your workstation then turn them upside down.
- To sample new aromas and surroundings shop at different places
- As social deprivation can impair brain functions engage in communication with someone you wouldn't normally converse with.
- To help revitalize your brain instead of having a cup of tea in your break time go for a brisk walk.
- If you normally write with a pen try writing with a pencil.
- Travel to work using a different transport or a different route.
- To use more than one of your senses in a different way try listening to a piece of music and smell a certain aroma at the same time.

Studies about the effects of mental exercise on cognitive function:

10 minutes of talking has a mental payoff

A study of 3,610 people aged 24—96 examined mental functioning and social interaction, and found that, across all ages, cognitive functioning was better the higher the level of participants' social interaction. Participants' level of social interactions was assessed by asking how often each week they talked on the phone with friends, neighbors and relatives, and how often they got together. Researchers controlled for age, education, race/ethnicity, gender, marital status and income, physical health and depression. In a second experiment involving college students, short-term social interaction lasting for just 10 minutes boosted participants' intellectual performance as much as engaging in so-called 'intellectual' activities for the same amount of time.

http://www.eurekalert.org/pub_releases/2007-10/uom-tmo102907.php

Age differences in cognitive benefits of exercise and mental stimulation

A mouse study has found that while physical exercise (a running wheel) and mental stimulation (toys), singly and together, improved memory in old mice, exercise alone or exercise and stimulation improved memory in middle-aged mice but not stimulation alone, and only exercise alone benefited young mice. The results suggest that as we get old and maybe less able to exercise, cognitive stimulation can help to compensate, but exercise is central to memory reinforcement at all ages.

http://www.eurekalert.org/pub_releases/2007-08/apa-eam080107.php

Alzheimer's pathology related to episodic memory loss in those without dementia

A study of 134 participants from the Religious Orders Study of the Memory and Aging Project has found that, although they didn't have cognitive impairment at the time of their death, more than a third of the participants (50) met criteria for a pathologic diagnosis of Alzheimer's disease. This group also scored significantly lower on tests for episodic memory, such as recalling stories and word lists. The results provide further support for the idea that a 'cognitive reserve' can allow people to tolerate a significant amount of Alzheimer's pathology without manifesting obvious dementia. It also raises the question whether we should accept any minor episodic memory loss in older adults as 'normal'.

http://www.eurekalert.org/pub_releases/2006-06/aaon-apr062006.htm

Simple Lifestyle Changes May Improve Cognitive Function

A study involving 17 people (35–69 years) with mild self-reported memory complaints but normal baseline memory performance scores, has found that 2 weeks on a program combining a brain healthy diet plan (5 small meals a day; diet rich in omega-3 fats, antioxidants and low-glycemic carbohydrates like whole grains), relaxation exercises, cardiovascular conditioning (daily walks), and mental exercise (such as crosswords and brain teasers) resulted in participants' brain metabolism decreasing 5% in working

memory regions (left dorsolateral prefrontal cortex), suggesting an increased efficiency. Compared to the control group, participants also performed better in verbal fluency.
<http://www.newsroom.ucla.edu/page.asp?RelNum=7062>

Risk of mild cognitive impairment increases with less education

A study of 3,957 people from the general population of Olmsted County, Minnesota is currently in train to find how many of those who did not have dementia might have mild cognitive impairment. A report on the findings so far suggests 9% of those aged 70 to 79 and nearly 18% of those 80 to 89 have MCI. Prevalence varied not only with age but also years of education: 25% in those with up to eight years of education, 14% in those with nine to 12 years, 9% in those with 13 to 16 years, and 8.5% in those with greater than 16 years.

http://www.eurekalert.org/pub_releases/2006-04/mc-mci033006.htm

Lifestyle changes improve seniors' memory surprisingly quickly

A small 14-day study found that those following a memory improvement plan that included memory training, a healthy diet, physical exercise, and stress reduction, showed a 5% decrease in brain metabolism in the dorsal lateral prefrontal region of the brain (involved in working memory) suggesting they were using their brain more efficiently. This change in activity was reflected in better performance on a cognitive measure controlled by this brain region, and participants reported that they felt their memory had improved. The memory training involved doing brainteasers, crossword puzzles and memory exercises. Diet involved eating 5 small meals daily (to prevent fluctuations in blood glucose levels) that were rich in omega-3 fats, low-glycemic index carbohydrates (e.g., whole grains) and antioxidants. Physical exercise involved brisk walking and stretching, and stress reduction involved stretching and relaxation exercises.

http://www.eurekalert.org/pub_releases/2005-12/g-nsf121205.htm

How higher education protects older adults from cognitive decline

Research has indicated that higher education helps protect older adults from cognitive decline. Now an imaging study helps us understand how. The study compared adults from two age groups: 18-30, and over 65. Years of education ranged from 11 to 20 years for the younger group, and 8 to 21 for the older. Participants carried out several memory tasks while their brain was scanned. In young adults performing the memory tasks, more education was associated with less use of the frontal lobes and more use of the temporal lobes. For the older adults doing the same tasks, more education was associated with less use of the temporal lobes and more use of the frontal lobes. Previous research has indicated frontal activity is greater in old adults, compared to young; the new study suggests that this effect is related to the educational level in the older participants. The higher the education, the more likely the older adult is to recruit frontal regions, resulting in a better memory performance.

http://www.eurekalert.org/pub_releases/2005-03/apa-bi030705.htm

Diet, exercise, stimulating environment helps old dogs learn

A new study of beagles provides more evidence that diet and mental stimulation are important in reducing or preventing age-related cognitive decline. The study, involving 48 older beagles (aged 7 to 11), compared four combinations of behavioral enrichment (regular exercise and lots of mental stimulation) and supplementation of diet with antioxidants had on a beagle's ability to learn: regular diet and regular experience; regular diet and enriched experience; regular experience and an enriched diet; and enriched diet and an enriched experience. The study followed the beagles over two years. Those in the groups with either an enriched diet or enriched environment did better than those without either, but those who had both the enriched diet and an enriched environment did noticeably better than all the rest.

http://www.eurekalert.org/pub_releases/2005-01/uot-mtc011705.htm

Being fluent in two languages may help keep the brain sharper for longer

A study of 104 people aged between 30 and 88 has found that those who were fluent in two languages rather than just one were sharper mentally. Those fluent in two languages responded faster on tasks assumed to place demands on working memory, compared to those who were fluent in just English, at all age groups. This is consistent with the theory that constant management of 2 competing languages enhances executive functions.

Bilingual volunteers were also much less likely to suffer from the mental decline associated with old age. The finding is consistent with other research suggesting that mental activity helps in protecting older adults from mental decline. The participants were all middle class, and educated to degree level. Half of the volunteers came from Canada and spoke only English. The other half came from India and were fluent in both English and Tamil.

<http://news.bbc.co.uk/2/hi/health/3794479.stm>

The Seattle Longitudinal Studies of adult intelligence suggested that the observed decline in many community-dwelling older people is probably a function of disuse and is often reversible. It was found that some 2/3 of participants in a cognitive training program showed significant improvement, and 40% of those who had declined significantly were indeed returned to their earlier (pre-decline) level of cognitive functioning. These training gains were retained over seven years.

<http://geron.psu.edu/sls/index.htm>