
Assessment & Maintenance of Mental Abilities

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Our brains are involved in the control and regulation of every function in our bodies. When brain functioning is impaired, problems can develop with any area of daily functioning including movement, speech, memory, attention, or emotional stability.

Changes in brain functioning can be caused by injury, illness, failure in development, substance abuse, or other factors. It is helpful for everyone to be aware of how to identify potential brain problems, how to foster optimal brain functioning, how to improve mental skills after illness or injury, and when to look for help if thinking ability seems to be slipping. Consider the following scenarios:

1. A man begins to notice that his 73-year-old wife is leaving her checkbook at stores where she shops, and walks away from the kitchen with the stove left on. He has told her several times about their financial status and estate plans, yet she repeatedly asks, in tears, where their money is and what will happen if he dies. Then she begins to argue with clerks about the money she receives in change after a purchase, even though he sees that it is the correct change.
2. A man in his 40's, who works as a general contractor, begins to have headaches, low energy, difficulty finishing articles in magazines, and increased irritability. He had previously had several falls on the job, as is common in his profession. Eventually, he begins to show up late at the work site, fails to arrive at work, and soon has fewer and fewer contracts.
3. A young man in his junior year of high school has been restless and overactive since early childhood. His motor skills developed late and he is still a bit uncoordinated. He did not learn to read until late in the second grade. He has had few friends, and is typically irritable with friends and family. He may not be promoted to his senior year and his parents are concerned.
4. After a partial stroke, a woman in her 30's is taking her medication and is in stable medical condition. Physical therapy and speech therapy have been successful, and she now walks and talks nearly the same as before the stroke. But family members notice that she sits by herself more than she did before, appears distracted or worried, and does not like to read anymore.

All of these scenarios suggest some difficulty in how the brain is working, and show the diverse difficulties that can result from such problems.

Loss or Change of Mental Abilities

Aging

While there is a normal decline in brain functioning with increasing age, the decline is normally not a steep one. It does not usually impair memory, number calculations, judgment, or problem-solving skills. What most people experience is a quite gradual slowing down in speed of their usual skills without much change in what they can do.

Typically, it is only aging in combination with medical difficulties, injury, or substance abuse which leads to significant loss of common thinking abilities.

Medical Conditions

Some medical problems can lead to significant impairments in brain functioning. These include: circulatory problems, heart attack or stroke, seizure, infections of the brain or spinal cord, brain surgery, extended loss of consciousness, developmental delay, long-term untreated depression, and dementia (such as Alzheimer's disease).

Substance/Alcohol Abuse

Abuse of alcohol or other drugs can cause temporary or permanent loss of mental function. It has been found that even "social" drinking of alcohol can result in enduring damage to the brain. What is more, those with a family history of alcohol abuse suffer more from the brain-damaging effects of alcohol than those without such a history.

Areas of Loss & Impaired Thinking

Mental abilities can become impaired in a variety of areas: attention (alertness and focus), concentration (sustained mental activity), immediate memory (short-term), delayed memory (long-term), ability to learn new material in a reasonable period of time, and abstract problem-solving. Abstract problem-solving is the most advanced and complicated mental skill we possess. This skill includes, for example, the ability to make analogies and comparisons and the ability to generalize information from one situation to another. This skill is the first to be lost when there is brain damage and the last to recover during improvement.

Identifying Changes in Mental Abilities

When an individual notices changes in their own mental abilities or in the abilities of a loved one, it is normal to want to understand what is happening, how extensive is the problem, and what is the prognosis for improvement or decline in the future. There are a number of other reasons for gaining a precise understanding of mental abilities:

- distinguishing disorders which are based on brain functioning versus those which are due to emotions, stress, or other non-organic factors
 - helping therapists and their patients identify possible problems in brain functioning which influence therapy
 - distinguishing malingering and factitious disorders from medical conditions
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A MENTAL NOTE

Early Detection

Many impairments in brain functioning are reversible through appropriate therapies, although some impairments are irreversible. Early detection can be helpful in stopping some processes and preventing further loss, in maintaining good functioning, or in leading to appropriate treatment.

Neurological Evaluation

A neurologist conducts a physical examination of general body functioning related to brain and spinal cord problems, and may combine this exam with radiological procedures. CAT or MRI scans produce a visual image of brain tissue. An EEG produces a graphic record of active brain functioning. Other procedures can provide visual or numerical information that is not available through physical examination alone.

The neurologist may treat the difficulty with medication. He or she may also refer the patient for additional treatment such as physical, occupational, speech, cognitive, or psychological therapies.

Neuropsychological Evaluation

A neuropsychological evaluation can provide a precise and detailed measure of the extent and nature of brain loss as well as an assessment of remaining strengths. The neuropsychologist is trained to provide precise statistical measures of ability and impairment in the following areas: movement, the senses, the ability to receive and produce language, intelligence, memory, academic learning, abstraction and problem-solving, as well as personality and emotional functioning.

In the neuropsychological examination or testing, the patient's current functioning is examined through a variety of paper-and-pencil, memory, writing, and discussion tasks. The individual being examined is then assessed based on:

1. a comparison with his or her estimated previous level of ability;
2. a comparison with the functioning of unimpaired men and women of the same age and educational level; and,
3. a comparison of each area of brain functioning to others (e.g., right brain versus left brain, frontal versus posterior, etc.)

This enables the neuropsychologist to determine whether isolated areas of brain activity are impaired.

How to Maintain Optimal Brain Functioning

If thinking skills have been impaired, a number of options are available to help bring about improvement. These include:

- occupational, speech, or cognitive therapy, which can help a person recover attention, concentration, memory, organizational, and abstract thinking skills.
- elimination of alcohol or drug use, which has been shown to result in an increase in thinking skills, both in the brain-injured and in the uninjured population
- aerobic exercise, dietary changes, and relaxation exercises, which can help eliminate the stress that can cause a reduction in thinking skills in some people
- treatment of anxiety or depression with proper medication and/or psychotherapy, which can lead to an increase in thinking ability in those who have suffered from these difficulties.

Both for the injured and the uninjured population, stimulation in brain

activity can help sustain thinking skills over the years and prevent a steeper decline than normal with age. Depression or a passive and withdrawn life style with progressive age more frequently cause problems with memory and thinking than illness or injury. Maintaining an active and interested outlook, staying involved with other people, seeking new horizons, taking reasonable risks with new activities, and engaging in thought processes that stimulate brain function, all can help maintain healthy brain activity into old age. These activities might include:

- balancing a checkbook without use of a calculator
- reading challenging material and testing oneself on the contents
- attempting to remember names or phone numbers without the use of electronic or written devices
- listening to a challenging lecture or documentary through audio-tape or videotape
- enrolling in academic classes
- attending lectures
- joining a book club
- reading manuals related to new occupational abilities
- academic and vocational training experiences which challenge the mind

Nothing provides an increase in brain transmissions more than frequent use of the brain such as the challenging activities listed here.

Conclusion

Neurological examination and neuropsychological testing can be important tools in assessing mental strengths and limitations. In the examples presented earlier, neurological and neuropsychological evaluations can help in pinpointing specific areas of difficulty or a change from prior functioning. These evaluations can also be helpful in determining rehabilitation and treatment directions.

There are avenues of improvement for both the injured and the uninjured population. We can maintain the integrity of many of our thinking functions despite injury, illness, or increasing age by continuing to use them. For persons of all ages, no matter what their medical history, brain activity can be sustained or improved by engaging in challenging mental activities throughout the life span.

- Normal aging involves a slowing of one's usual activities, not a dramatic impairment of previous skills
- Injuries, some illnesses, various medical problems, and substance abuse can temporarily or permanently impair brain functioning
- Changes in brain functioning can usually be observed in: attention, concentration, short-term and long-term memory, the ability to learn new material, and abstract problem-solving
- Early detection can be helpful in stopping some losses, in maintaining good brain functioning, or in leading to appropriate treatment
- A neurologist and neuropsychologist can provide necessary information about level of impairment and can help to establish treatment strategies
- Regular challenges to our brains through a variety of activities can lead to optimal functioning across the lifespan.

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