Assessing the Aging Physician: Neuropsychological and Psychological Factors Pertaining to Fitness for Duty

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PACE PROGRAM

The aging physician population

Around the world there are growing concerns about the dependence on aging medical professionals.

In Canada, the percentage of doctors aged 65 or above is expected to reach 20% by 2026.

25% of Australia's medical workforce is at least 55 years old.

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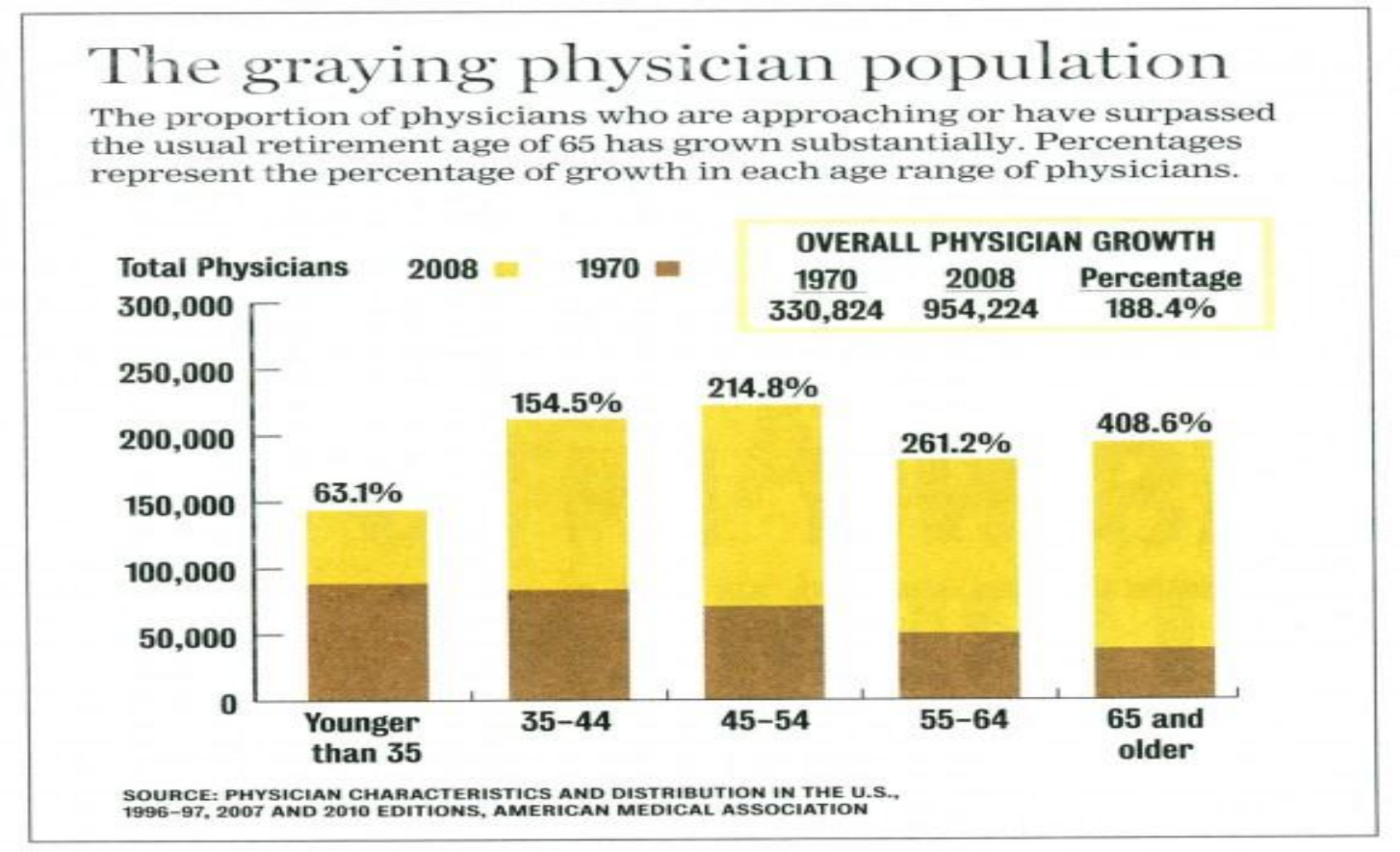
Aging Physicians in the United States

20.3 % are over the age of 65



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Conventional wisdom about physician expertise generally holds that the longer a physician has been in practice, the better honed his or her clinical skills become

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The aging physician population: Ageism?

- Hobus et al. (1987) presented physicians with short case histories consisting of a patient's picture, previous disease history, and presenting complaint.
- A strong positive correlation between experience and diagnostic accuracy (r = .68).
- Their initial hypotheses however was correct only 38% of the time.

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WHAT ARE THE CONCERNS?

What Are The Concerns?

Choudry, Fletcher & Soumerai Ann Intern Med. 2005;142:260-273.

Physicians with more experience are generally believed to have accumulated knowledge and skills during years in practice and therefore to deliver high-quality care. However, evidence suggests that there is an inverse relationship between the number of years that a physician has been in practice and the quality of care that the physician provides.

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Systematic Review: The Relationship between Clinical Experience and Quality of Health Care

Choudry, Fletcher & Soumerai Ann Intern Med. 2005;142:260-273

Of 62 published studies that measured physician knowledge or quality of care and described time since medical school graduation or age, more than half suggested that physician performance declined over time for all outcomes measured (including screening for cancer, depression adherence to standards of care).

Only 1 study showed improved performance for all outcomes measured.

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What are the concerns ?

Waljee and colleagues (2006) found that patients undergoing a complex operation, such as pancreas removal or heart bypass, are more likely to die within 30 days of surgery if the surgeon is 60 or older (Ann Surg;244[3]:353-362).

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Norcini, et al. (2000) Certification and specialization: do they matter in the outcome of acute MI?

- Studied 4546 physicians
- Acute MI mortality increased by 0.5% for every year since graduation from medical school

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Surgeon characteristics associated with mortality and morbidity following carotid endarterectomy. O'Neill L, Lanska DJ, Hartz A Neurology. 2000;55:773–781

- They studied the relationship between years since licensure of the surgeon (and other factors) and death, or complications short of death, for the procedure of carotid endarterectomy. The study included 12,725 operations in 284 hospitals. Increased years since surgeon licensure predicted increased rate of patient death but did not predict nonfatal complications.

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So the question has to be asked

WHY?

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Errors are part of life

- It was reported in the New York Times that a Kaiser Foundation health plan medical director said that “three to five percent of the nation’s then 425,000 practicing physicians, have an ‘impairment’ of some degree from a wide variety of causes.”

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Is it incompetence-really?

- In his book, The Blind Eye, James B Stewart stated that in 1986 “five out of every 100 doctors are so incompetent, drunk, senile or otherwise impaired that they should not be practicing medicine without some form of restriction”

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Are we picking on physicians ?

Added Responsibility when working in high-risk environment with unforgiving human error

The commercial airline pilot must have:

- a first class medical certificate every 6 months.
- must submit to random breathalyzer and urine tests for substance abuse.
- must check out in a simulator at least once a year, and there are additional checkouts required by the airline carriers.

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Pilots versus Physicians

- The commercial airline pilot must submit to unannounced checkouts by an air carrier inspector (FAA).
- The medical evaluation of the commercial pilot is quite extensive and includes 11 pages in the FAA manual on the neurologic evaluation alone, checking for seizures, vertigo, cerebrovascular accidents, demyelinating diseases, multiple sclerosis, collagen disease, degenerative diseases, infections.

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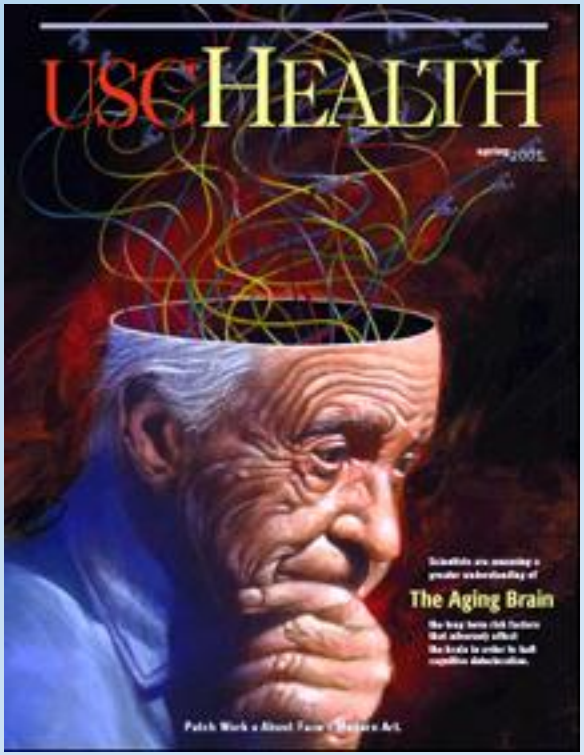
Aging and the Brain



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Aging and the Brain

- Brain weight and volume decrease. On average, the brain loses 5-10 percent of its weight between the ages of 20 and 90
- A decrease in grey matter volume
- Dendritic spines and cortical neurons decrease in size and number
- Inflammatory proteins occur in maturing adults (including the hippocampus, responsible for forming new memories)
- Age-related changes in dopamine synthesis

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The Question: Does age effect competence?

Facts of aging;

- Cardiovascular changes (hypertension)
- Renal Changes (strong relationship BMI and Memory)
- Pulmonary Changes
- Urogenital changes
- Decreased visual acuity
- Often decreased hearing
- Decreased physical strength and stamina

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The Question: Does age effect competence?

Facts of aging on cognition;

- Decreased reaction time
- Decreased fine motor skills/ dexterity
- Difficulty learning new concepts and skills
- Decreased comprehension of complex information
- Decreased analytic processing

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Understanding the cognition-performance link in older physicians

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Understanding the cognition-performance link in older physicians

It is well documented that some (but not all) cognitive abilities decline with age in adults (Craik & Salthouse, 1992).

Information- processing speed, for example, slows, and the capacity to hold information in working memory may also decline with age (Cerella, 1994).

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Crystalized vs. Fluid Knowledge

- Crystalized knowledge involves accumulated knowledge and expertise and relies on long term memory…habitual procedures, which tend to hold up well as we age.

- Fluid knowledge involves novel problem solving, spatial manipulation, mental speed, and identifying complex relations among stimulus patterns.

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Crystalized Abilities

Crystalized abilities increase during the lifespan through education, occupational and cultural experience and exposure to culture and intellectual pursuits.

They are less affected by aging and disease and often remain intact in the early stages of dementia or after brain injury.

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Fluid Abilities

The developmental trajectory of fluid abilities follow neurological maturation, peaking in the mid 20s and declining gradually until the 60s when a more rapid decline takes place.

Fluid abilities are affected by neurological insult, genetics and biological aging processes.

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The Aging Physician and Changes in Cognitive Processing and Their Impact on Medical Practice

Eva & Barnes (2002) Acad Med,77:S1-S

- Analytic processing tends to decline with age whereas nonanalytic processing remains stable.
- Older physicians tend to do less well when dealing with novel, conflicting, and complex patient situations.
- The more individuals rely on their prior experience, the less of a tendency there will be to critically incorporate novel conflicting information.

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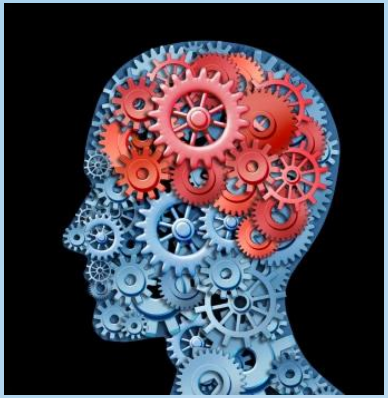
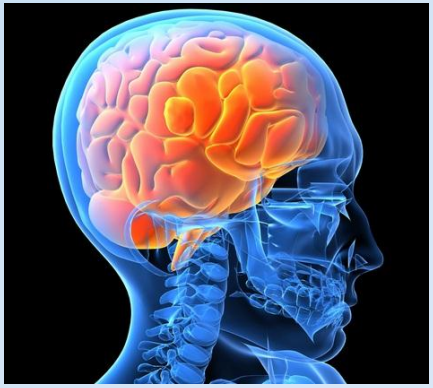
Assessment of Cognitive Abilities: determining competence using neuropsychological assessment





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Goals of a Neuropsychological/Fitness for Duty Evaluation

- Physicians are among those special groups who operate in an environment unforgiving of human error, where cognitive failure can lead to catastrophic consequences.
- Neuropsychological testing is one means of selecting capable doctors. It is also a means of screening for covert disease, and it can be used to establish baseline performance data and provide ongoing monitoring of health.

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Goals of a Neuropsychological/Fitness for Duty Evaluation

- To aid in diagnosing a neuropsychological/neurological condition (dementia, Mild Cognitive Impairment, Significant Attentional Disorder).

- To determine if a primary health condition (cardiovascular /pulmonary/ hepatic and renal changes) is impacting his/her cognitive functioning.

- To determine if cognitive traits or deficits, personality traits or stress reactions are causing or contributing to problem behavior or substandard performance.

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Impairment vs. Cognitive Weakness

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Impairment defined

- Physician impairment is defined by the Federation of State Medical Boards as “the inability to practice medicine with reasonable skill and safety because of physical or mental illness including, but not limited to aging, alcoholism, drug dependence, and habitual or excessive alcohol or chemical use or abuse” (Rassekh, 1996, p. 213)

Cognitive Weakness ≠ Impairment

- Cognitive strengths refer to the underlying brain skills needed for a particular task. These are the skills that allow us to process the huge influx of information.
- Imagine trying to run the latest software on an outdated computer? Or asking a computer with a small processor or insufficient memory to handle several complex tasks at once?
- Underlying systems aren't up to speed.

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Neuropsychological Domains and its Relationship to Medical Practice

Neuropsychological Function	Medical Practice
Premorbid intelligence and reading skills	• Indication of a decline in function over time. • The ability to profit from continuing education.

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Neuropsychological Domains and its Relationship to Medical Practice

Neuropsychological Function	Medical Practice
Attention	• The ability to attend and determine what is critical and salient. • To sustain auditory and visual attention over a sustained period of time. • The ability to inhibit incorrect responses

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Neuropsychological Domains and its Relationship to Medical Practice

Neuropsychological Function	Medical Practice
Learning and Memory	• The ability to learn and integrate new information and draw from past experience. • The ability to recognize and recall information efficiently and quickly, without irrelevant information impeding.

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Neuropsychological Domains and its Relationship to Medical Practice

Neuropsychological Function	Medical Practice
Perceptual-motor skills	• The ability to perform physical tasks. • Eye-hand coordination. • The ability to manipulate instruments with fine-accuracy

Neuropsychological Domains and its Relationship to Medical Practice

Neuropsychological Function	Medical Practice
Executive Function Skills	• recognize the significance of unexpected situations in order to quickly make alternative plans when unusual events arise. • planning or decision making abilities. • error correction or troubleshooting.

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MicroCog: Assessment of Cognitive Functioning

Powell, D. H., Kaplan, E. F., Whitla, D., Catlin, R., and Funkenstein, H. H. (1993).

Developed by the The Risk Management Foundation of the Harvard Medical Institutions.

Their original purpose was to produce an instrument that could screen elderly physicians for cognitive impairment and thereby reduce their malpractice liability.

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MicroCog: Brief Description

- Computer-administered and -scored test of cognitive functions.
- Intended as a screening device for cognitive impairment or diagnostic tool for use as part of a general neuropsychological examination.
- Designed to be sensitive to detecting cognitive impairment across a wide age range.
- Takes into account levels of premorbid intellectual functioning by providing age- and education-level adjusted norms.

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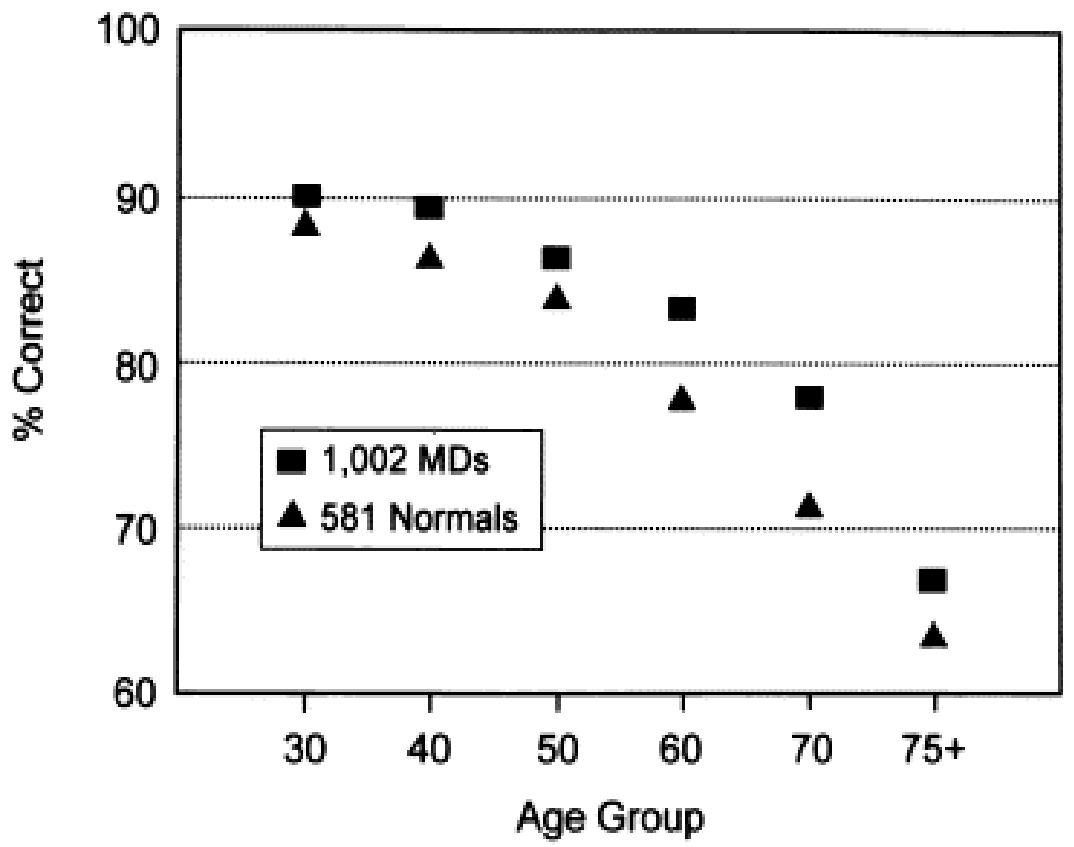
MicroCog Validity from Powell D. Profiles in Cognitive Aging. Cambridge, MA (1994)



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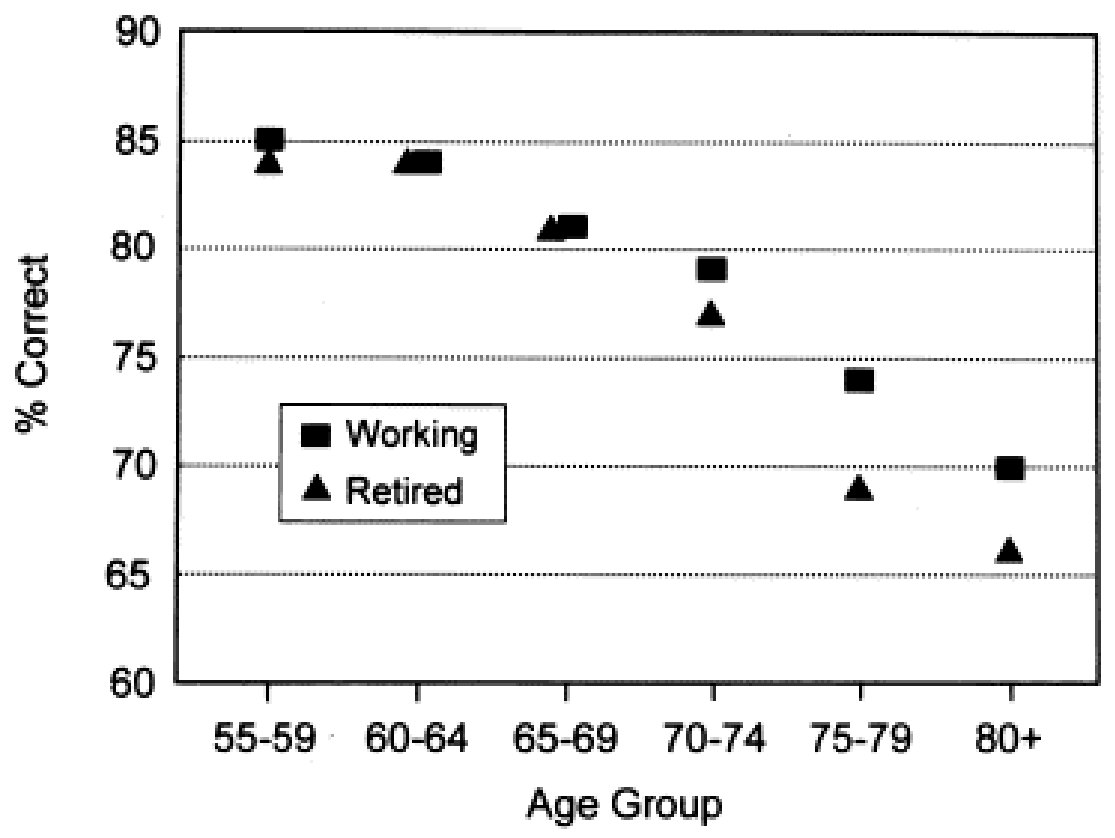
MicroCog scores of working and retired MDs



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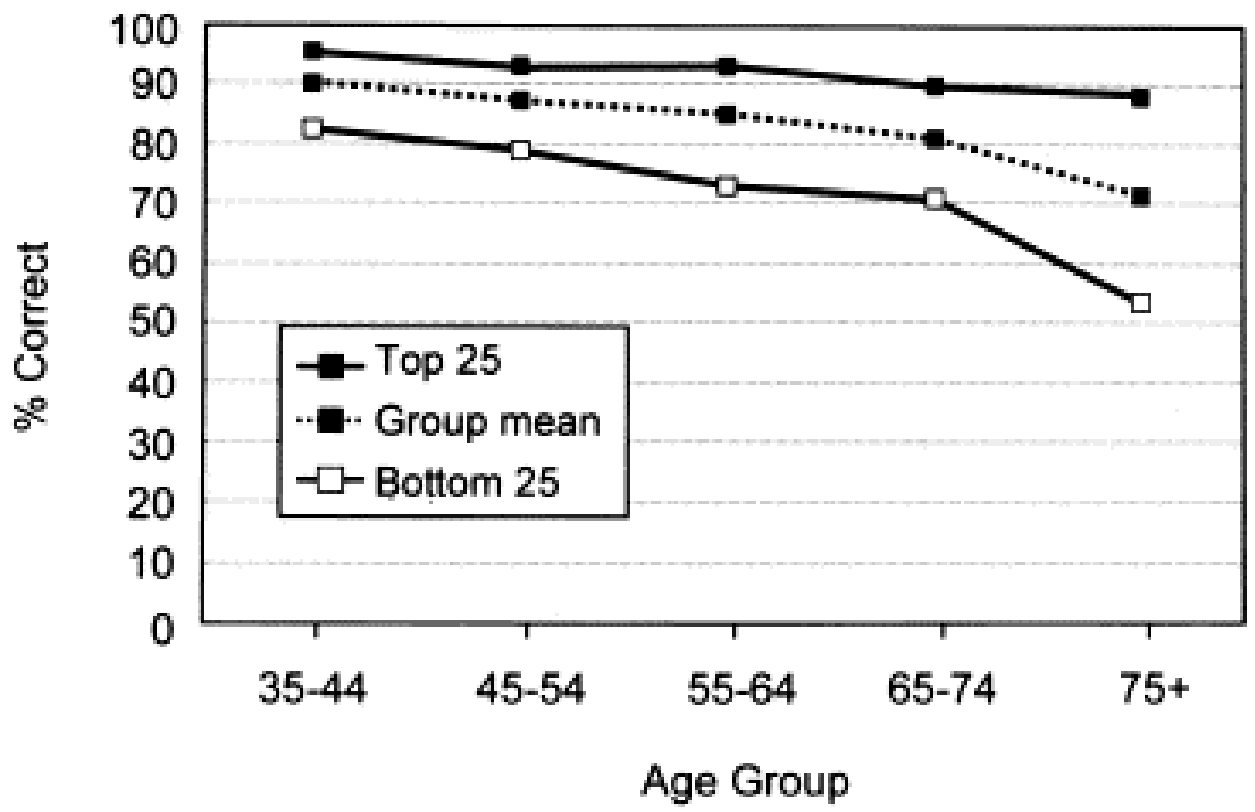
MicroCog: Average attention scores of top and bottom 25 MDs compared with age group means



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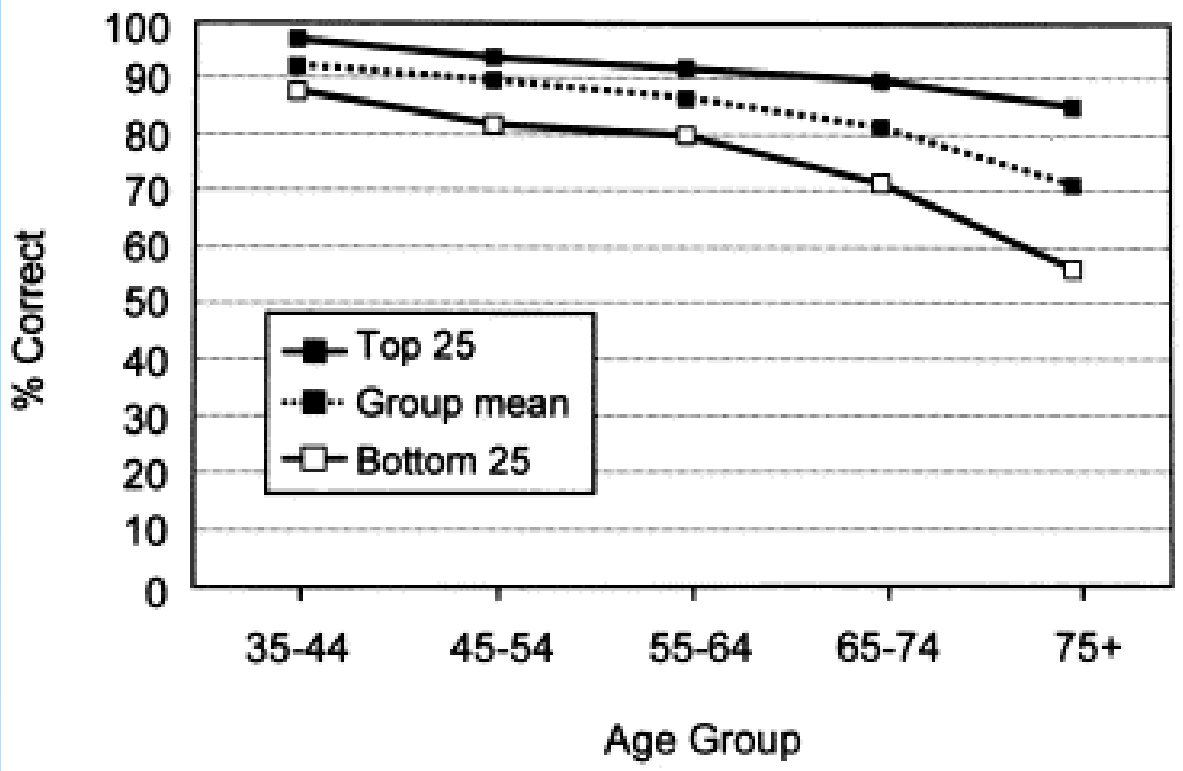
MicroCog:Average verbal memory scores of top and bottom 25 MDs compared with age group means



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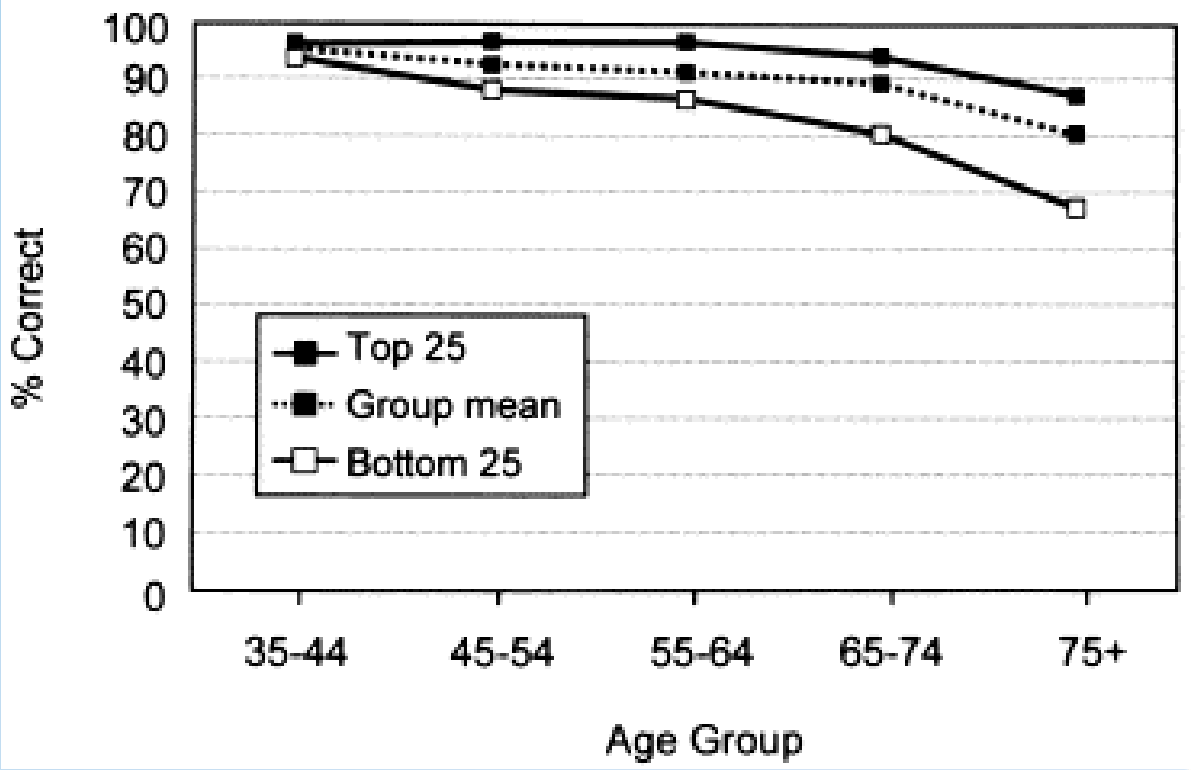
MicroCog:Average visuospatial scores of top and bottom 25 MDs compared with age-group means



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Neuropsychological research on physicians

Why do we need neuropsychological assessment anyway? Can't we just talk to peers?

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Psychomotor testing predicts rate of skill acquisition for proficiency-based laparoscopic skills training.

Stefanidis D, Korndorffer JR Jr, Black FW, Dunne JB, Sierra R, Touchard CL, Rice DA, Markert RJ, Kastl PR, Scott DJ.
Surgery. 2006 Aug;140(2):252-62

The Relationship between Tests of Neurocognition and Performance on a Laparoscopic Simulator.

Kuzbari O, Crystal H, Bral P, Atiah RA, Kuzbari I, Khachani A, Aslam MF, Minkoff H.
Minim Invasive Surg. 2010;2010:486174.

Visuo-spatial ability in colonoscopy simulator training.

Luursema JM, Buzink SN, Verwey WB, Jakimowicz JJ.
Adv Health Sci Educ Theory Pract. 2010 Dec;15(5):685-94.

Laparoscopic performance is related to Neuropsychological test performance.

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A retrospective review of the neuropsychological test performance of physicians referred for medical infractions.

Perry W, Crean RD.

Source

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Abstract

Physician-related errors are rising, resulting in an increase in disciplinary actions by licensing medical authorities. It has been previously reported that cognitive impairment may be responsible for 63% of all physician-related medical adverse events. In this paper we examine neuropsychological testing results from 148 physicians referred for assessment by the California Medical Board (CMB) for various infractions. The neuropsychological test performance of the physicians was compared to normative reference samples. Overall, they performed in the average range on most measures; however, they demonstrated relative deficits on tests of sequential processing, attention, logical analysis, eye-hand coordination, verbal and non-verbal learning. These findings reveal that this cohort of physicians is performing lower than expected on tests of intellectual and neuropsychological functioning. Applying a neuropsychological framework to the assessment of physicians may uncover potential cognitive factors that contribute to medical practice errors.

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Cognitive Changes and Retirement among Senior Surgeons (CCRASS): Results from the CCRASS Study

Linas A Bieliauskas, MS, PhD, Scott Langenecker, MS, PhD, Christopher Graver, PhD, H Jin Lee, MSC, PhD, Jillian O'Neill, MPH, MBA, Lazar J Greenfield, MD, FACS

BACKGROUND: Because individuals age cognitively at different rates, there is considerable interest in ways to assure that older surgeons have the physical and mental stamina, coordination, reaction time, and judgment to provide appropriate care. To clarify potential relationships between cognitive changes related to aging, the decision to retire, and changes in patterns of surgical practice, this study aimed to identify specific parameters of cognitive change among senior surgeons.

STUDY DESIGN: Computerized cognitive tasks measuring sustained attention, reaction time, visual learning, and memory were administered to 359 surgeons at the annual meetings of the American College of Surgeons over a 6-year period. A self-report survey was also administered to assess subjective cognitive changes and the status of surgical practice and retirement decisions.

RESULTS: Expected age-related cognitive decline was demonstrated on all measures, although measured reaction time was notably better than age-appropriate norms. There was a marked relationship between self-reported subjective cognitive change and retirement status, but not to changes in surgical practice. There was no notable relationship, however, between subjective cognitive change and objective cognitive measures. There were marked relationships between age and retirement decision or status and between age and changes in surgical practice.

CONCLUSIONS: These results suggest that although self-perceived cognitive changes play a role in the decision to retire, they are not related to objective measures of cognitive change, and are not reliable in the decision to retire. The development of readily accessible measures of cognitive changes related to aging may serve to assist decisions either to continue surgical practice or to retire. (J Am Coll Surg 2008;207:69–79. © 2008 by the American College of Surgeons)

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Cognitive functioning, retirement status, and age: results from the Cognitive Changes and Retirement among Senior Surgeons study.

Drag LL, Bieliauskas LA, Langenecker SA, Greenfield LJ.
J Am Coll Surg. 2010 Sep;211(3):303-7

- They concluded that the majority of practicing senior surgeons performed at or near the level of their younger peers on all cognitive tasks, as did almost half of the retired senior surgeons. This suggests that older age does not inevitably preclude cognitive proficiency.

Number of tests	Age group								
	60–64		65–69		70–74		75+		Total
	n	%	n	%	n	%	n	%	
0	43	78	14	48	7	47	2	22	66
1	10	18	11	38	7	47	7	78	35
2	2	4	4	14	1	6	0		7
3	0		0		0		0		0
Total	55	100	29	100	15	100	9	100	108

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Cognitive difficulties are not only due to neuropsychological problems

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Doctors' Toughest Diagnosis: Own Mental Health

ERICA GOODE Published in New York Times : July 08, 2003

- Reluctant to call attention to their plight, doctors who become depressed often try to act as their own psychiatrists, in many cases prescribing for themselves inadequate doses of antidepressants.

- "Most of the physicians who come to see me for their depression fight it out themselves first," said Dr. J. John Mann, a professor of psychiatry and radiology at Columbia. "They come in because the treatment wasn't working and the depression became so severe they couldn't handle it."

- Yet the biggest obstacle to depressed doctors' dealing openly with their illness, experts say, is that such openness carries the risk of serious consequences

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Doctors and Suicide

Over several decades, studies have consistently shown that physicians have higher rates of suicide than the general population — 40 percent higher for male doctors and 130 percent higher for female doctors.

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CASE EXAMPLE

Case 1

Dr. XXXX, M.D., is a 68-year-old, married, right-handed male who was referred for a Fitness for Duty/neuropsychological evaluation as part of the Physician Assessment and Clinical Education program (PACE). He was referred by his hospital medical group where he has been practicing since the mid 1990s. Dr. XXXX was referred to the PACE program after 4 accounts of apparent “wrong site” spinal surgery operation. Each account was easily explained by the physician.

Case 1

Dr. XXXX enjoyed an outstanding career and earlier had the position of Chief of Surgery at a prestigious teaching hospital. He was of reasonably good health and did not have a history of psychological difficulties, substance use or physical trauma. He was well-liked by his colleagues and had a solid home life.

Case 1 Performance on FFD assessment

- He was extremely articulate and clearly put forth his best effort.
- The results of the evaluation indicated that that his general level of intellectual functioning was above-average range.
- His strengths were in tests of verbal ability.
- In contrast he performed poorly on spatial, non-verbal tests.
- His profile, however, was notable for committing a high number of omission errors under time-demand and for taking an unusually long time initiating moves on certain tasks that involve complex-decision making.
- Furthermore, he performed poorly on a test of manual dexterity, was relatively slow with regard to speed of information processing and his motor speed was slow when compared to his peer group.

Case 1 Determination

- “Overall, this pattern of impairment is not suggestive of a dementia. Furthermore, some low scores are commonly observed on extensive neuropsychological batteries even among healthy individuals. However, Dr. XXXX’s below-average performance across numerous non-verbal and speeded measures is atypical when compared to the general public as well as those persons with similar years of education.”

Case 1: Conclusion

- Poor attention to salient detail, slow processing and poor dexterity can potentially be problematic and affect one's ability to perform surgical procedures, given that surgery requires consistent attentional control and highly skilled, fine manual movements.
- "The deficits observed on testing may emerge and be especially problematic when Dr. XXXX is faced with complex situations where sustained attention to critical details, mental flexibility, and problem solving of abstract situations under time-demand is required."

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Case 1 Follow Up

- While travelling to visit us for his evaluation his home institution conducted an intensive focused review of his surgical cases and uncovered 9 more examples of below SOC practice.

- With this information, in addition to the results from our assessment, the physician surrendered his license and retired.

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Questions

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