As members of the medical staff, senior Certified Registered Nurse Anesthetists (CRNAs) are beginning to find themselves subject to the late career practitioner policies that some healthcare systems are adopting. According to the American Association of Nurse Anesthetists, practitioners over the age of 60 years make up almost 23% of our workforce. Mandatory retirement ages in other high-stress and critical public safety professions such as pilots, air traffic controllers, and Federal Bureau of Investigation agents have been in place for many years despite the protections of the Age Discrimination in Employment Act. Medicine has opposed any suggestion of mandatory retirement ages. Since the Institute of Medicine’s publication 20 years ago of To Err is Human, there has been continued growth in the patient safety movement and consumer involvement in healthcare. One concern continues to be age-related cognitive decline in clinicians. In this review article, the author discusses the physiology of aging, retirement, cognitive decline, and competency. Also reviewed are the current cognitive tests used for screening and the history of this practice. Legal struggles in screening late career practitioners also are explored.

**Keywords:** Age discrimination, competence, late career practitioner, mandatory retirement, mild cognitive impairment, neurocognitive testing.

According to the most recent statistics from the American Association of Nurse Anesthetists (AANA), 1,846, or 10.7%, of Certified Registered Nurse Anesthetists (CRNAs) 65 to 80 years old are still in clinical practice, and 2,023, or 11.7%, of clinically practicing CRNAs are between the ages of 60 and 64 years. Thus, 22.4% of our current nurse anesthesia workforce is currently above the age of mandatory retirement of a number of other high-stress and critical public safety professions. According to the US Department of Justice data on mandatory retirement, Congress has approved fixed retirement ages for some professions that affect public safety despite the Age Discrimination in Employment Act (ADEA) of 1967. This includes air traffic controllers (age 56 years), Federal Bureau of Investigation agents (age 57), nuclear material couriers (age 57), border patrol officers (age 57), federal law enforcement agents (57), and several others. Commercial airline pilots were also counted in this number until 2009 when Congress changed the mandatory retirement age from 60 to 65 years, primarily because of work force shortages. Nurse anesthetists are currently also experiencing workforce shortages in some areas of the country. When the mandatory retirement age was raised for pilots, additional requirements were included with this change such as creating a co-pilot minimum age, testing requirements, medical examinations, simulation testing, and peer assessment. Pilots over the age of 40 years have a license renewal requirement of every 6 months and must pass a flight review test every 24 months. Members of the US government, Congress, and our supreme court justices, however, do not have a mandatory retirement age.

This article reviews the literature pertaining to late career practitioners (LCPs), especially in the context of anesthesia providers.

**Methods**

In the preparation of this manuscript, the author obtained articles through PubMed, Cumulative Index to Nursing & Allied Health Literature (CINAHL), Medscape, and published requirements from several healthcare systems that have instituted LCP policies. Search terms used included neurocognitive testing, late career practitioner, aging and competence, mandatory retirement, and patient safety.

**The Late Career Practitioner**

Nearly all articles found addressed clinical competence in surgeons and in physicians in general, with only a few specifically addressing anesthesiologists. Only 2 of the articles mentioned nurse practitioners, physician assistants, and CRNAs. Many of these providers are part of the medical staff of hospital systems and therefore fall under healthcare and medical staff LCP policies. It should be noted that LCP policies in healthcare facilities are not widespread across the country; nor are they standardized among the systems that have adopted them. Some systems screen providers every other year after age 70, some systems screen every year, and some do not begin until age 75. Some healthcare systems not only use physical examinations and cognitive testing but also include peer review. Many healthcare systems and hospitals only test for cause if a provider has been reported or a department has requested it.
Aging

Beginning at ages 40 to 50 years, vision and hearing begin to diminish; in healthy aging, varying degrees of reduced processing speed, free recall, multitasking ability, attention span, and greater distractibility can be expected, with the greatest decline seen after age 65.7–9 Annual prevalence estimates for mild cognitive impairment (MCI) range from 12% to 18% in persons older than 60 years. The prevalence increases with age, from 10% in individuals aged 70 to 79 years to 25% for those aged 80 to 89 years.10 These numbers vary slightly in different sources. Mild cognitive impairment is not dementia and does not meet the criteria for dementia. Signs and symptoms of MCI are often vague and might include memory loss, language disturbance (difficulty finding words), attention deficit (difficulty following or focusing on conversation), and deterioration in visuospatial skills (disorientation in familiar surroundings in the absence of motor and sensory conditions that would account for the complaint).11 In studies of physicians, research shows that between ages 40 and 75 years, the mean cognitive ability declines by more than 20%. There is also significant variability from one person to another, indicating that although some older physicians are profoundly impaired, others retain their ability and skills.3 Age-associated cognitive changes are variable from individual to individual, as are declines in stamina and fine motor skills.12,13 In other words, we do not all age the same or at the same rate.

In a review of the negative relationship between physician age and performance, Eva14 pointed out that crystallized intelligence (eg, accumulated knowledge) was better preserved than fluid intelligence (eg, negotiating a maze or overcoming first impressions by recognizing that alternatives are possible). Additionally, habitual memory was better preserved than controlled analytic memory.14

Competence and Aging

Competence is defined as “the quality or state of having sufficient knowledge, judgment, skill, or strength (as for a particular duty or in a particular respect).”15 Although clinicians’ responsibility and commitment to practice competently does not change throughout their professional careers, age-related changes can influence their ability to do so.12 For defining competence in the field of anesthesiology, the successful practice relies on a number of competencies, including a store of current medical knowledge, the ability to efficiently apply that medical knowledge, the capacity to exercise sound medical judgment in a broad range of circumstances, the ability to effectively work with other members of the surgical team, and the ability to perform a myriad of intricate cognitive and technical tasks.16 Interestingly, one author states that performance in the operating room relies on additional skills, based primarily on experience and judgment, which often permit older anesthesiologists to compensate for any cognitive deterioration.17 In fact, age may impart enough advantages that under certain circumstances, older professionals enjoy a definite advantage over their younger colleagues.18 In 2009, Captain “Sully” Sullenberger was a senior pilot on the cusp of retirement when he safely landed his disabled plane on the Hudson River. His years of experience, it can be argued, saved all 155 people aboard the flight that day.

According to Tessler et al,19 anesthesiologists older than 65 years have twice the number of poor patient outcomes compared with anesthesiologists under the age of 50, despite taking on easier cases, which the authors state is often common in physicians past the typical retirement age. They also have 1.5 times the risk of litigation even though they often do fewer cases as well.19

In an abstract presented at the 2015 American Society of Anesthesiologists (ASA) meeting, a study was disseminated regarding the older anesthesiologist and patient safety.20 In the study it was reported that there was no mortality difference related to the anesthesia provider’s age. The authors stated that most older practitioners had adjusted in their practice patterns and were doing more anesthetics using monitored anesthesia care, were administering fewer regional anesthetics, and were caring for fewer patients who were ASA classes 3 and 4. Older practitioners were also reported to be less likely to work evenings/call, weekends, and holidays. Many were reported to work part time, in surgical centers with shorter cases and healthier patients, and were more likely to be in practice using the anesthesia care team model. Although this may also be true of the senior CRNA in practice, no statistics related to safety and the age of our practitioners have yet been published, to this author’s knowledge.

According to an article written 19 years ago by Jonathan Katz,21 MD, anesthesiology was considered a high-stress practice and “regarded by many as a young person’s specialty”. In general, anesthesiologists retire at a younger age than do physicians in other specialties.21–23

Several medical journals have addressed proposals contemplating a mandatory retirement age for physicians. These were, and continue to be, met with vigorous protests and threats of age-discrimination lawsuits among various physician groups. The result has been a discussion and recommendations for professionalism and reporting oneself or colleagues with declining skills, despite the evidence that physicians avoid reporting these colleagues.6,24,25 In a 2005 study, Farber et al26 found that physicians would be more likely to report a colleague impaired because of substance abuse than one impaired by cognitive decline or psychological impairment.

Since the publication of To Err is Human by the Institute of Medicine (now the National Academy of Medicine) in 2000,27 there has been a greater focus on patient safety and consumer involvement in medicine. In November
2015, the American Medical Association Council on Medical Education issued a report, *Competency and the Aging Physician*, that called for “guidelines/standards for monitoring and assessing both their own and their colleagues’ competency.” In 2016, the American College of Surgeons released a “statement on the aging surgeon.”

Although the AANA has information on retirement and health and wellness on its website, not much is devoted to the LCP. You will find much information on healthy aging, retirement planning, the importance of social groups, adjustment and positive mental attitudes, physical exercise, and money management for retirement, among others. All these resources are geared to life after anesthesia, but what about the practitioner who chooses to continue practice into his or her golden years? If you go further into the Health and Wellness/Patient Assistance section of the AANA website, you will be able to access Physical Well-Being and Healthy Aging Resources with a link to the University of California at San Francisco (UCSF) Memory and Aging Center (<https://memory.ucsf.edu/>), which does speak to dementia and Alzheimer’s disease, but there are apparently no resources on the AANA website about LCP practice and cognitive testing.

Our AANA Code of Ethics speaks to our health and competence in “2. Responsibility as a Professional”: “2.1 Engages in a scope of practice with individual competence and maintains role-specific competence” and “2.5 Is physically and mentally fit for duty.” Although this is general in scope, it can be interpreted as covering our responsibility to be fully fit for duty and not impaired whether due to substance abuse or to other mental or physical illness. Age and the variability it encompasses may be hard to assess and interpret. According to Katz, the ASA code of ethics is similar to ours in its generality. Katz writes: “The practice of quality anesthesia care requires that anesthesiologists maintain their physical and mental health and special sensory capabilities.”

**History and Use of Late Career Practitioner Testing**

In 2015 a 40-page guide was published titled *Assessing Late Career Practitioners: Policies and Procedures for Age-based Screening, A Guideline from California Public Protection and Physician Health, Inc.* It calls for “federal and state law mandating that entities, including hospitals, medical staffs and physician groups, that employ, contract with, or grant privileges to physicians to provide services to patients, hospitals, medical staffs and physician groups, engage in active oversight of the quality of care rendered by those practicing at the facilities.”

“The statement of purpose of this document is intended to assist all those on medical staffs, in medical groups, and other entities that have responsibility for decisions related to evaluating a practitioner’s health and well-being as they impact the their ability to practice medicine safely.” The guide gives key points to establishing a policy. It recommends that the requirements apply to all members of the medical staff who have reached a specified age, that the terms of the screening are based solely on age (and that screening for cause be a separate policy), that the literature support the age and safety connection, that the policy be connected to the reappointment and privileging process, and that the healthcare or medical staff set the terms of the frequency and cost of the testing. The guide also recommended that this information be protected and confidential. The policy as recommended includes screening for mental health, alcohol and substance abuse, and hearing and vision as part of the included physical examination. Also included are peer assessment by an approved peer representing a wellness committee, and neurocognitive screening (MicroCog). Although screening for age-related decline was being done before 2015, this guide provided a clear set of policies and recommendations. Not all the recommendations are followed as set forth in this guide, and many variations, tests, and policies appear to exist in systems that do screen at all. Approximately 10% of healthcare systems now have some form of screening triggered only by a birthday, even if limited to certain departments.

**Cognitive Tests**

A number of cognitive tests have been reviewed and tested as an ideal screening tool for MCI and could be used for LCP testing. The Mini-Mental State Examination (MMSE) is the most commonly used cognitive screen. It has reasonable sensitivity and specificity for dementia: 77% and 90%, respectively, in high-prevalence specialist settings, and 81% and 87%, respectively, in low-prevalence settings.

The Saint Louis University Mental Status (SLUMS) examination measures orientation, recall, attention, calculation, language, constructional praxis, and fluency.

The Montreal Cognitive Assessment (MoCA) was designed as a rapid screening instrument for mild cognitive dysfunction. It assesses different cognitive domains: attention and concentration, executive functions, memory, language, visuoconstructive skills, conceptual thinking, calculations, and orientation.

BrainCheck is a computerized cognitive assessment aid, a prescription device that uses an individual’s score on a battery of cognitive tasks to provide an interpretation of his or her current level of cognitive function. It is registered as a Class II medical device with the US Food and Drug Administration (FDA).

The MicroCog, which is presently the most commonly used cognitive examination, is a commercially developed, computer-administered, self-scoring test of cognitive functions primarily intended to screen for cognitive impairment. The test, released in 1993 by the Risk Management Foundation of the Harvard Medical Institutions, began as
a tool that could screen elderly physicians for cognitive impairment, to decrease their medical malpractice liability. Originally designated the Assessment of Cognitive Skills, its name was changed to MicroCog when the Psychological Corporation took over production and marketing of the software in 1994. The test is administered on a computer with a proctor present. No pencil and paper or electronic device is permitted. The length of the testing is approximately 60 minutes and consists of 18 subtests. It contains 5 question domains: (1) attention and mental control, (2) memory, (3) reasoning and calculation, (4) spatial processing, and (5) reaction time. Most responses are scored for both accuracy and speed. Subjects are instructed at the outset that although both accuracy and speed are measured, accuracy is more important. Instructions to each of the subtests appear on the screen before the start.

A key portion of the MicroCog tests memory, a mental skill known to decline with age. Clinicians are asked to read a short story, then promptly answer multiple-choice questions about it. About 20 minutes later, the clinician is again prompted to answer more multiple-choice questions about the story. In the spatial recall portion of the test, the clinician is briefly shown a pattern of darkened squares within a 3 × 3 tic-tac-toe grid, then must re-produce the pattern on a keypad. Another test displays clock faces with hour and minute hands, but no markers, and the clinician must tell the time. The math portion requires the provider to add, subtract, multiply, and divide, and enter answers on a numeric keypad, working from left to right. In the literature, data regarding the MicroCog indicate a 17% false-negative rate and a 4% rate for false positives in trying to identify clinicians who are truly cognitively impaired. Although the MicroCog is currently used in many testing facilities, recent published data state that use of the MicroCog is controversial.

The MicroCog is scaled for not only age but also level of education. Physicians as a group have been screened at a consistently higher level because of their education, which has been the same regarding years in school. Practicing CRNAs currently have a wide range in their educational backgrounds. Some CRNAs in practice may have obtained their education when our programs were essentially override these laws as mentioned previously. According to Moore, “By enabling hospitals to identify physicians of all ages who pose risks to patient safety in a way that aligns with the principles of the ADEA and ADA, they can strike the appropriate balance between fostering patient safety and not discriminating against one physician demographic.” It was also stated that “healthcare organizations should not institute an age-based cognitive screening program unless certain conditions are satisfied. These conditions are that clear evidence supports
the rationale for the program and that the program is not legally prohibited. This article argues that neither condition is currently met.43

The truth of this statement became apparent when recently Yale New Haven Hospital in New Haven, Connecticut, was served with an age discrimination suit regarding its policies of LCP testing clinicians over age 70 years.44

Discussion

Patient safety is the hallmark of anesthesia care. In the last 20 years we have witnessed many changes in our practice, all aimed at creating a safe environment for the patients we care for. The ergonomic changes in our machines, the creation of our smart pumps, the medication delivery systems, and electronic patient medical records have all been created and perfected to prevent human error. But, what about the human at the head of the table? Are we as fit as we should be? Are we as fit as we need to be?

Our workforce is aging, and with it come the changes that accompany aging. We know that we do not all age the same. The airline industry for some time has been ahead of medicine in addressing safety and aging. It has instituted policies, beginning at the age of 40 years, to screen those on the front-line of safety: the pilots. The aviation industry has continued to follow up these individuals with frequent assessments of their health, vision, cognition, and skills. Pilots are also assessed through simulation. They have a baseline established to monitor the changes that come with aging. Our nurse anesthesia practitioners have no baseline. Other industries have established fixed retirement ages. Medicine has debated this but with much pushback from the various specialties. Given the legal implications and ramifications not only to the provider but also to the future projections of healthcare staffing shortages, it appears unlikely that a national standard or recommendations will be made any time soon in healthcare.

Late career practitioner policies have been adopted by approximately 10% of our healthcare systems nationwide to date, with others working to adopt and implement these policies. Hospitals need to balance patient safety and institutional liability with the dignity of an experienced practitioner and that practitioner’s value to the hospital and society. Experience and wisdom are not measured by cognitive tests but must be accounted for in assessing competence. It is unclear whether such decline, especially in executive function tasks that govern abstract reasoning, organization, and problem solving, especially in novel situations, can be compensated for by the benefits of experience.45

There are no standard policies across healthcare systems that have LCP policies. Some healthcare systems in the same geographic area do not have any LCP policy and only screen for cause. A practitioner wanting to avoid the LCP assessment can merely get privileges “across town” to keep practicing. Age ranges triggering a review are variable and can range from 70 to 75 years. Some healthcare systems use physical examinations, visual tests, neurocognitive tests such as the MicroCog, and peer review. Some include only selected measures. Some systems create their own neurocognitive testing,46 and some rely heavily on peer review. The Anesthesia Patient Safety Foundation and the Foundation for Anesthesia Education and Research have been supportive of studies related to simulation training and assessment of performance.47

The American Board of Anesthesiology was the first of the member boards of the American Board of Medical Specialties to recognize the potential value of simulation experiences in maintaining current knowledge and began to require these experiences within its Maintenance of Certification in Anesthesiology (MOCA) process in 2010.47 Many senior practitioners were “grandfathered in” and were not included in this assessment. Although simulation has been discussed, it is still not used in LCP testing in any systems currently reviewed. According to a brief review in the Canadian Journal of Anaesthesiology, simulation-based assessment will play an increasingly important role both in certification and in maintenance of certification for anesthesiologists.48

The AANA needs to be involved in representing and educating senior clinical practitioners, reviewing the evidence, making recommendations, and participating in the national discussion of LCP screening. As more CRNAs are entering private practices and working autonomously, issues of age and safety will need to be addressed. We need more data regarding the senior nurse anesthesia practitioner and competency. Because we seldom work with each other and do not see each other practice, assessment for cognitive changes by peers is rarely a part of any screening. In the anesthesia care team setting, we are more likely to be reviewed by physician anesthesiology colleagues or supervisors, just as we may find ourselves assessing them. Reports of cognitive impairment are more likely to come from other nurses working in close proximity, such as circulators, or from residents or surgeons whose patients we are administering anesthesia to. Our recertification each year is dependent on continued education and proof of continued practice. Soon we will also be reviewed by testing related to practice, the Continuing Professional Certification Assessment (CPCA) from the National Board of Certification and Recertification for Nurse Anesthetists.

Healthcare systems are moving toward LCP policies. As these policies are studied, more validity data will be forthcoming with less controversy. Best policies hopefully will be adopted. These should include not only neurocognitive tests but also physical examinations and an annual peer review using peers from an assigned group in the institution. Simulation should be considered. Perhaps
clinician testing should begin at age 40, as it does for the airline pilots. In this way, a baseline would be established and changes could be monitored. Use of neurocognitive testing remains controversial and should be used only with additional parameters. For the sake of patient safety, any practitioner that appears to be impaired should be recommended for review.

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