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SYSTEMATIC REVIEWS

Hanging up the surgical cap: Assessing the competence of aging surgeons

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Abstract

BACKGROUND

As the average age of surgeons continues to rise, determining when a surgeon should retire is an important public safety concern.

AIM

To investigate strategies used to determine competency in the industrial workplace that could be transferrable in the assessment of aging surgeons and to identify existing competency assessments of practicing surgeons.

METHODS

We searched websites describing non-medical professions within the United States where cognitive and physical competency are necessary for public safety. The mandatory age and certification process, including cognitive and physical requirements, were reported for each profession. Methods for determining surgical competency currently in use, and those existing in the literature, were also identified.

RESULTS

Four non-medical professions requiring mental and physical aptitude that involve public safety and have mandatory testing and/or retirement were identified: Airline pilots, air traffic controllers, firefighters, and United States State Judges. Nine late career practitioner policies designed to evaluate the ageing physician, including surgeons, were described. Six of these policies included subjective performance testing, 4 using peer assessment and 2 using dexterity testing. Six objective testing methods for evaluation of surgeon technical skill were identified in the literature. All were validated for surgical trainees. Only Objective Structured Assessment of Technical Skills (OSATS) was capable of distinguishing between surgeons of different skill level and showing a relationship between skill level and post-operative outcomes.

CONCLUSION

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A surgeon should not be forced to hang up his/her surgical cap at a predetermined age, but should be able to practice for as long as his/her surgical skills are objectively maintained at the appropriate level of competency. The strategy of using skill-based simulations in evaluating non-medical professionals can be similarly used as part of the assessment of the ageing surgeons' surgical competency, showing who may require remediation or retirement.

Key Words: Aging surgeon; Competency; Surgical skill; Surgeon retirement

Core Tip: A surgeon should not be forced to hang up his/her surgical cap at a predetermined age, but should be able to practice for as long as his/her surgical skills are objectively maintained at the appropriate level of competency. The strategy of using skill-based simulations in evaluating non-medical professionals can be similarly used as part of the assessment of the ageing surgeons' surgical competency, showing who may require remediation or retirement.

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INTRODUCTION

The aging surgeon has remained a contentious patient safety issue, as the average age of surgeons continues to rise. The number of physicians exceeding the age of 65 has more than quadrupled in almost 40 years, and surgeons are no exception[1]. Currently, 38% of surgeons working in Canada and over 46% of the surgeons in the United States are above the age of 55 and 16% of Canadian surgeons are over the age of 65[2-4]. When should an older surgeon stop operating? This becomes an important issue when we consider that the surgical profession is highly dependent on memory, sensory acuity, clinical decisiveness, technical skills and physical stamina; skills and abilities that may decrease with age.

Like all professionals, surgeons are fallible and vulnerable to the natural process of aging in which cognitive and physical skills experience a decline. The relationship between surgeon age and operative risk is controversial and uncertain, with some studies showing worse outcomes and some showing reasonable, or even better outcomes[3,5-7]. Even so, there are accounts of prominent older surgeons struggling with simple fine motor skills and clinical decision making; while various studies have demonstrated that senior surgeons have worse outcomes than their younger colleagues, suggesting surgeon age is an operative risk factor[2,8-12]. In the past two decades, more research has been dedicated to studying the aging surgeon and trying to find more effective ways to help surgeons experiencing age-related decline[8,13-15].

Although age has been identified as a possible occupation hazard in the surgical profession[9,10], other professions within the public sector have maintained a more proactive approach with their aging workforce. These strategies include enforcing strict certification and mandatory retirement. Currently, retaining certification in a surgical field is not as rigorous a process and retirement of surgeons remains largely at their discretion, relying on the assumption that they are fully capable of identifying their own cognitive and physical regression[1,2]. Both the American College of Surgeons (ACS) and American Medical Association (AMA) recognize the safety implications of the aging physician and surgeon; and have recommended practitioners aged 65 to 70 undergo voluntary physical examination and visual testing, in addition to peer-reviewed performance evaluation for re-credentialing[1,2]. Programs have been developed to assess the competence of aging surgeons and guide them depending on their incapacities or capacities[16,17]. However, no standardized approach to address age-related deterioration in surgeons exists at this time.

In order to address this issue, we performed a scoping review of well-established

and accepted policies of testing for competency of aging non-medical professionals from the industrial workplace. In particular we sought to identify strategies used to determine competency that could be transferrable in the assessment of aging surgeons. In addition, we reviewed the present testing of senior surgeons by hospitals to determine if the testing specifically addresses the skills, other than knowledge, required to maintain their competency to perform surgery.

MATERIALS AND METHODS

In order to identify mandatory testing of non-medical professions, where cognitive and physical competency are necessary for public safety, we conducted scoping review of the literature in PubMed, EMBASE, Google Scholar and Google using the terms mandatory retirement, mandatory retirement testing, retirement, mandatory retirement ages, surgeon retirement. The Google search engine was used to locate websites describing these professions within the United States. The mandatory age and certification process, including cognitive and physical requirements, were reported for each profession.

Google Scholar and the Google search engines were used to search for current policies, at health institutions in the United States, that are being used to evaluate older physicians and surgeons with regard to their ability to provide safe and high-quality care. The search queries used were: Late career practitioner policy, late career practitioner, assessing late career practitioners, aging physician policy, and aging surgeon policy. These policies were described based on their objectives, candidates, examination procedures, and modification of privileges.

Methods for determining surgical competency currently in use or practice as well as those existing in the literature were identified. Licensing bodies and subspecialist certification boards were described, along with their use of Continuing Medical Education (CME) and Maintenance of Certification (MOC) as a means of assessment. These agencies were selected as they are invested in ensuring the clinical competency of practicing physicians for the welfare of the general public[18,19]. The published literature was reviewed for objective assessments of surgical technical skills that were shown to be valid and reliable, as well as predictive of surgeon competency and improved patient outcomes for surgeons. Studies were identified through a search of databases, including PubMed, EMBASE, and Google Scholar. Search queries were developed from the following keywords: Technical skill, surgery, assessment, surgical training, surgical skill. Objective assessment tools identified in the database search were described if studies evaluating these tools were written in English, evaluated participants performing surgical tasks, and analyzed the validity and reliability of the objective assessment. Review articles found were used to identify studies assessing the reliability and validity of the objective assessment tools. Virtual reality simulators were excluded as assessment tools as they are often used primarily to determine the validity and reliability of the performance tools in mock surgical procedures, rather than for assessment of surgical skills. All search queries were completed by May 20, 2020.

RESULTS

Non-medical professionals

Four non-medical professions requiring mental and physical aptitude that involve public safety and have mandatory testing and/or retirement were identified: Airline pilots, air traffic controllers, firefighters, and United States State Judges (Table 1). The nature of their work is such that any condition which compromises their competency, such as knowledge; cognition; illness or physical stamina; can put many members of the public at risk. As a result, these professions have mandatory retirement at specific ages, as well as strict recertification and licensing programs. A mandatory retirement age, which is different for each occupation, is enforced in all 4 professions. An annual medical exam is required for 3 of these professions; a skills refresher course and assessment in two of the professions; and a physical ability test in one to maintain the professional's ability to continue working. These skill assessments, knowledge or physical, are designed to reflect the competency and proficiency standards of their profession. They entail simulated situations one may expect to encounter as part of their profession.

Table 1 Surgeon certification compared to non-medical professions

Occupation	Mandatory retirement age (yr)	Certification based on cognitive and/or physical requirements
Surgeon[33]	None	Complete residency and board examination. Continuous self-learning or medical education (CME) for credit with periodic examination for certification. May have case list peer-reviewed and be evaluated by in-hospital staff. No physical exam or performance-based skills currently defined
Airline pilot[34,35]	65	Every 24 mo, complete flight review with instructor: Ground/flight training. Must demonstrate proficiency, competency, and sound judgement within approved standards during training. Medical certificate every 12 mo or every 6 mo if age > 40 yr
Air traffic controller[36-38]	56, 61 with exception	Apply at < 31 yr. Medical exam. Pass biographical assessment, pass the ATSA, and pass training course at FAA academy. The ATSA is designed to measure the cognitive, visuospatial reasoning, and psychomotor abilities of candidates. Must submit to yearly physical exam, and job performance twice a year, with periodic drug screenings. Certificate valid until surrendered, suspended, or revoked
Firefighter[39,40]	57	Complete CPAT. Complete annual medical exam and physical testing, depending on department discretion. Physical testing consists of exercises related to firefighting such as step tests, and leg lifts
United States State Judge[41,42]	70-75	Obtained law degree and passed Bar examination. State court often requires mandatory retirement for state court judges

ATSA: Air traffic controller specialists skills assessment battery; CPAT: Candidate Physical Ability Test; CME: Continuing medical education; FAA: Federal Aviation Administration.

Late career practitioner policies

There are currently no mandatory retirement criteria for all surgeons in North America. We identified 9 late career practitioner policies designed to evaluate the ageing physician, including surgeons. One of the policies, the Aging Surgeon Program at Sinai Hospital, specifically targets the aging surgeons, but is identical to the Hospital's evaluation of medical doctors, and has no specific testing of surgical skills (Table 2). All nine of these policies vary according to their trigger for assessment, the assessments being utilized (medical exam and performance testing), and their influence on hospital privilege modification. Eight of the policies use age to identify physicians that require cognitive and physical testing, starting typically at the age of 70 years, with repeated testing required every 1 or 2 years. All 9 physician monitoring programs have a medical exam component, focusing on general health, cognition, vision, and hearing testing, although the evaluation process does vary from program to program. Performance testing is part of the evaluation in 6 of the health systems and is done by peer assessment in 4, and only done by dexterity testing in 2. In the peer review assessment, two policies address the technical and procedural competencies required by surgeons to safely and effectively perform surgery. The evaluation of these technical competencies is subjective in nature, where candidates are rated on scale from "significant concern" to "outstanding" clinical competence. Observed performance or behavior that influenced the peer assessment must be commented if labeled "significant concern" or "minor concern". The results of the testing could be used to modify the physician's privileges in 7 of the 9 health systems identified.

Competency assessments in the workplace

Licensing bodies and certification boards in the United States and Canada use CME and MOC as assessment methods to ensure continued clinical competency in the surgical workplace of board-certified surgeons (Table 3). However, these competency evaluations only address knowledge and do not take into account surgical skills, and to some degree judgment. State and provincial licensing bodies can initiate a competency evaluation by independent evaluator if a surgeon has been identified to the licensing body as performing below the accepted level of competency. Within the hospital setting, the surgeon-in-chief is primarily responsible to the community for the safety of the operating room and the competence of surgeons on the staff.

Several tools using surgical simulation or direct observation are currently being used on practicing surgeons to evaluate performance and technical skills needed for a surgical specialist (Table 3). Six of these tools reliably and accurately detect different level of technical skills among study participants, consisting of surgical trainees, fellows, and staff. All of these methods were validated for surgical trainees. Objective Structured Assessment of Technical Skills (OSATS) is the only method capable of distinguishing between surgeons of different skill level and showing a relationship

Table 2 Late career practitioner policies adopted at health institutions

Program	Objectives	Candidates	Medical exam	Performance testing	Modification of privileges
Stanford Health Care[16,17]	To ensure high quality care for patients and protect them harm and identify health concerns of practitioners	74.5 years old and every 2 yr thereafter	Comprehensive history and physical examination including vision, hearing, neurological, and cognitive testing	Peer assessment by hospital staff of technical and procedural competencies, relative to Stanford expectations	Yes, if non-compliant or unsafe practice patterns
Aging Surgeon Program at Sinai Hospital, Baltimore, MD[43]	Designed to protect patients from unsafe surgeons and guard surgeons from arbitrary or unreliable methods of assessing competence or cognitive capacity. The program can identify potentially treatable or reversible disorders that, if properly treated, could restore or improve functional capacity	No mandatory age. Requested from surgeons, hospitals or licensing bodies of all surgical sub-specialties	Evaluation of general health, vision, hearing, neurocognition, visual-spatial and fine motor capability	None	No
Hartford Health Care[44]	To ensure patient safety and high-quality medical care	70 years old and above, and annually thereafter	Annual physical exam, vision, neurological testing and neuropsychological screening	OPPE. FPPE if needed, to identify patterns that may negatively impact quality and safety of care	Yes, discussion with department Chief ± Credentials Committee if deemed unable to safely exercise privileges
YNHH[21,45]	To protect patients from harm and safeguard fair physician assessment	70 years old and above	Ophthalmologic exam and 16 test neuropsychologic screening battery	None	Yes, MSRC suggestions based on screening results
Legacy Health, OR[46]	To assess physicians to ensure patient safety and physician wellness	70 years old and above, and every 2 yr thereafter	Physical capacity by occupational therapy and neuropsychological testing	Peer review assessment	Yes, determined by Credentials Committee, if health problems interfere with safe practice
Driscoll's Children's Hospital, Corpus Christi, TX[17]	To assure that patient safety and quality are adequately supported by carefully assessing the capabilities, competencies and health status of each practitioner	70 years old and above	Comprehensive examination addressing physical and mental capacity by a physician	Peer review assessment may be required. Must meet technical and procedural competencies	Yes, determined by Credentials committee, if practice unsafe or incompetent
University of Virginia Health System[17]	To assess each physician's capacity to perform requested privileges	First assessment at age 70. Annual assessment after 75 years of age	Comprehensive examination addressing physical and mental capacity under the Physician Wellness Program	None	Yes, as determined by Department Chair
UC San Diego LCHS[47,48]	To detect any physical or mental health problems that may affect a physician's ability to practice	70 years old and above. At request of hospital or medical group	History and physical exam. Cognitive and mental health screen	Dexterity tests for proceduralists/surgeons	No
Tahoe Forest Health System, CA[49]	To fairly and accurately evaluate physician performance and capabilities	70 years old and above. Required to partake in LCHS	See LCHS	See LCHS	Yes, after consultation with department Chair if adjustment is required

OPPE: Ongoing Professional Practice Evaluation; FPPE: Focused Professional Practice Evaluation; YNHH: Yale New Haven Hospital; MSRC: Medical Staff Review Committee; LCHS: Late Career Health Screening for Physicians and Healthcare Professionals.

between skill level and post-operative outcomes.

Surgical procedures and/or skills are evaluated by an expert, or non-medically trained reviewers with regards to Crowd-Sourced Assessment of Technical Skills (C-SATS), using a paper-based tool in six of the object assessments, blinded to the post-graduate year of the participant. The objective assessments were designed for common surgical procedures extending over multiple specialties, including laparoscopic cholecys-tomy, open reduction and internal fixation (hip, wrist, or ankle), arthroplasty, and robotic prostatectomy. Global Operative Assessment of Laparoscopic Skills (GOALS) and Global Evaluative Assessment of Robotic Skills (GEARS), however, target laparoscopic and robotic surgery only. The last tool, Direct Objective

Table 3 Existing methods for determining surgical competency

Method	Basic structure	Assessment	Procedure examples	Validated[1] for	
				Practicing surgeons	Surgical trainees
Licensing bodies assessments					
State Medical Boards[50-52]	Mandatory to practice. Required to demonstrate competency through CME. However, states individually may evaluate professional conduct when a physician fails to provide appropriate quality of care	Must regularly participate in CME activities and may require board certification. May have competency evaluation by independent evaluator or approved assessment program if signs of dyscompetence	-	Unclear	-
ABMS[18,19]	Voluntary certification to show knowledge of standards of practice. Rigorous process of evaluation every 10 yr with MOC	MOC consists of 4-part assessment: Licensure/professional standing, participation in CME programs, cognitive expertise through examination, and documentation of quality of care and/or audits or peer review	-	Unclear	-
Provincial Licensing Bodies in Canada[53-55]	Mandatory to practice. Required to demonstrate competency through CME. Provincial licencing bodies identify those with deficiencies in competence, requiring peer review	Must regularly participate in CME activities. If evidence of dyscompetence, rigorous individualized assessment of the surgeon's practice is performed, with emphasis on quality of care	-	Unclear	-
Fellows of the RCPSC[56,57]	Voluntary certification to show commitment to competent practice. Evaluation and successful completion of MOC program every 5 yr	Must participate in CPD activities. MOC based on 3 section framework: Group learning, self-learning, and assessment	-	Unclear	-
Non-licensing bodies assessments					
OSATS[58-61]	Multi-station and timed with bench and live model simulations or surgical procedures. Peer evaluated with rating scale	Checklist and global rating scale by expert examiner to evaluate technical skill. Does not assess decision making or concrete surgical aspects	Laparoscopic Gastric Bypass Saphenofemoral dissection. Meniscectomy transtibial or anteromedial femoral tunnel	Yes	Yes
C-SATS[26,31]	Video recorded surgical performance and evaluated with validated with rating scale	Crowds of anonymous and independent reviewers, including those nonmedically trained, evaluate surgical skill with validated performance tools such as OSATS	Urinary bladder closure. Robotic surgery skills	No	Yes
O-SCORE[27,62]	Surgical procedure peer evaluated with rating scale	Surgical experts rate performance with 9 item tool and scaling system to assess competence to perform procedure independently	Open reduction internal fixation of hip, wrist, or ankle. Arthroplasty (total hip or hemi). Knee arthroscopy	No	Yes
GOALS[63,64]	Laparoscopic procedure peer evaluated with rating scale	Surgical experts evaluate performance with 5-point rating scale of 5 items unique to laparoscopy	Laparoscopic cholecystectomy	No	Yes
GEARS[65,66]	Robotic procedures peer evaluated with rating scale	Surgical experts evaluate performance with 5-point rating scale of 6 items unique to robotic surgery	Inanimate simulators–continuous suturing. Prostatectomy	No	Yes
Direct Objective Metric Measures[67,68]	Skill/surgical procedure measured with concrete aspects	Measurement of stiffness and failure load for each repair construct, with comparison to expected rehabilitation loads	Tibial plafond fracture reduction. Distal radius fracture reduction	No	Yes

[1]To note: Methods to determine surgical competency are deemed valid for (1) Experienced surgeons; or (2) Residents/trainees if the assessment (continuing medical education, maintenance of certification or rated technical skill) correlated with experience level and/or with patient outcomes. Validity was shown for specific procedures within specific subspecialties. For example, experienced bariatric surgeons who had higher rated technical skill in laparoscopic gastric bypass surgery had patients with fewer post-op complications[46]. Generalized validity has yet to be shown in literature with regards to the technical skill assessments, although validity was typically demonstrated across several procedures. ABMS: American Board of Medical Specialties;

CME: Continuing medical education; MOC: Maintenance of certification; RCPSC: Royal College of Physicians and Surgeons of Canada; CPD: Continuing professional development; OSATS: Objective structured assessment of technical skill; C-SATS: Crowdsourced assessment of technical skills; O-SCORE: Ottawa Surgical Competency Operative Room Evaluation; GOALS: Global operative assessment of laparoscopic skills; GEAR: Global evaluative assessment of robotic skills.

Metric Measures, uses measurable metrics to determine skill level instead of technique. Direct Objective Metric Measures investigate the stiffness and failure load of the final surgical product, which are critical within the orthopaedic field.

DISCUSSION

For almost all of history, people worked until they died. Retirement is a recent phenomenon, starting during the Great Depression when governments, unions, and employers, desperate to make room in the workforce for young workers institutionalized retirement programs as we know them today, complete with social security and pension plans. Initially, the designated retirement age of 65 was longer than the life expectancy, but as life expectancy has increased, retirement age in certain professions has become more arbitrary. Surgeons may continue to work longer than other professionals because of their satisfaction and gratification in treating patients, because their work connects the surgeon to an identity or for financial reasons. Surgeon's retirement age remains a contentious issue and presently there is no mandatory retirement age for surgeons. Furthermore, we could not find any universal, well-established and accepted policies of testing for competency of aging surgeons.

Although a review of 65 studies of physicians' retirement planning found that most physicians retire between ages 60 and 69 years, some surgeons delay retirement because of financial insecurity, lack of other interests or fear of change in their personal lives and identity[20]. Despite the well-recognized decline of cognitive and physical skills with ageing, most surgeons only require verification of their CME to maintain their medical license to practice, in the absence of skill-based simulations that regulate non-medical professionals. Airline pilots, air traffic controllers, firefighters, and United States State Judges were found to have thorough medical examinations and skill assessments during their practice. Regardless of inherent ability, they are further subjected to mandatory retirement ages. Although the United States Age Discrimination and Employment Act of 1967 protects individuals at or above the age of 40 from mandatory retirement ages, employers have established a legitimate age-based criterion referred to as a bona fide occupational qualification (BFOQ), allowing them to justify an age-based BFOQ for certain professions.

Despite age being a variable process, the potential association within the surgical profession between increasing age and poorer operative outcomes has been reported in some studies[9-12]. The mandatory late career practitioner policies identified in this study begin to address the competency of the surgical workforce, through cognitive and physical testing. Performance testing consisted of peer-review assessment and varied across the different health institutions. In the absence of standardized technical skill assessments and continued legal challenges[21], age may not be the most reliable and objective performance indicator.

Surgeons, like other medical specialties, need to regularly engage in activities that keep them up to date with standards of care. However, the requirements to be certified or licensed are highly dependent on the standards developed by individual states, provinces or specialty boards. Furthermore, the validity of CME and MOC, defined as the ability to distinguish expertise level and effects on patient outcomes, was noted as unclear based on available literature. CME, such as didactic educational meetings, were shown to have only a small effect on clinical practice and patient outcomes[22,23]. Completion of MOC is not associated with differences in complication rates in specific surgical subspecialties[24]. In fact, surveyed surgeons were in favor of improving MOC with additional testing such as cognitive assessments or review of cases for older surgeons, in place of a mandatory retirement age[25]. Meeting CME or MOC requirements alone does not guarantee a successful surgical practice, despite being used to certify surgeon competency.

Similar to the testing of pilots and air traffic controllers, there are surgical simulators designed to provide an objective assessment of surgical technical skills. Although these simulators have been used primarily for surgical residents to gauge their level of training, surgical simulators can equally be used to evaluate practicing surgeons by

their peers or recognized experts[26,27]. These simulators may then be used to assess surgical competency among, not only older surgeons, but all surgeons as part of their medical education, showing who may require remediation or retirement. However, one of the most significant limitations in the use of simulation for assessing competence for aging surgeons–namely the ability to evaluate the most important skill that dictates surgical expertise and competence: Intra-operative cognitive skills. To date, very few if any surgical simulations have demonstrated the ability to assess advanced mental processes such as decision-making and judgment; and pattern recognition. These cognitive behaviors (or "thinking skills") are some of the most important aptitudes that dictate performance in the operating room and better methodologies are required to measure them[28]. In addition, the use of simulators would need to be specialty specific and the specialty societies have not yet built these programs.

While this study demonstrated that current competency assessment methods for older surgeons require improvement, the study was limited by various factors. This study is a scoping review, thereby providing an overview of an important topic, without describing every possible assessment tool. Information regarding non-medical specialties was constrained to predefined professions, weakening the comparative analysis between these professions and surgeons. Other non-medical professions were not investigated, although the ones presented are commonly known. The number of late practitioner policies identified was also small, as they needed to be accessible online. It is clear that other policies exist, some of which have been referenced to online, such as Sharp Rees-Stealy Medical Group, Intermountain Healthcare in Utah, Scripps Health network in San Diego, Arkansas Children's Hospital, Cooper University Hospital, University of Pittsburgh Medical Center, and Virtua Health[29,30]. However, their policies are not explicitly described so that it is unclear whether or not these policies address older surgeon competence in a similar manner to the policies discussed in this study, or in a manner separate from cognitive testing or peer-assessment. As well, there are likely other late practitioner policies that exist but are not present online. In addition, the non-licensing body surgical simulators have been studied across different procedures within different specialties, but the generalizability remains in question. For example, Crowd Sourced Assessment of Technical skills (C-SAT) was shown to be valid for robotic skills amongst urology residents but whether it is valid in orthopaedics or other specialties is not known[26,31]. And given that these surgical simulators have largely been validated for distinguishing skill among surgical residents, more studies need to evaluate the validity and reliability of these simulators for staff surgeons before even considering implementation. In addition, even when there is a valid technique for objective assessment of competence in the execution of particular operations by surgeons, such as the assessment of intraoperative videos, there has been low utilization due to its labor-intensive nature involving human factors (cognitive engineering) expertise[32].

CONCLUSION

Surgery is a profession that requires good surgical judgment, as well as manual dexterity and physical skills for performing an operation. Age alone is not an indication of surgical competence, so testing of these attributes is necessary to ensure that the ageing surgeon remains competent. This requires regular periodic review of the surgeon's outcomes and skills to ensure that the ageing surgeon has the competency to meet the standards of the profession. The strategy of using skill-based simulations in evaluating non-medical professionals can be similarly used as part of the assessment of the aging surgeons' surgical competency. While more studies investigating the validity of these simulators is needed, future implementation of these simulators may ensure all aging surgeons maintain an appropriate professional standard for patient safety. A surgeon should not be forced to hang up his/her surgical cap at a predetermined age, but should be able to practice for as long as his/her surgical skills are objectively maintained at the appropriate level of competency. For those aging surgeons with a diminishing skillset, there other potential options to integrate these surgeons into important aspects of surgical care such as assisting younger surgeons for more complex cases, teaching and training the next generation of surgeons, coaching surgeons in practice, being involved in quality-improvement and leadership roles.

ARTICLE HIGHLIGHTS

Research background

The aging surgeon has remained a contentious patient safety issue, as the average age of surgeons continues to rise.

Research motivation

When should an older surgeon stop operating? This becomes an important issue when we consider that the surgical profession is highly dependent on memory, sensory acuity, clinical decisiveness, technical skills and physical stamina; skills and abilities that may decrease with age.

Research objectives

The aim of this scoping review study was to investigate strategies used to determine competency in the industrial workplace that could be transferrable in the assessment of aging surgeons and to identify existing competency.

Research methods

Scoping review.

Research results

Surgeon's retirement age remains a contentious issue and presently there is no mandatory retirement age for surgeons. Furthermore, we could not find any universal, well-established and accepted policies of testing for competency of aging surgeons.

Research conclusions

A surgeon should not be forced to hang up his/her surgical cap at a predetermined age, but should be able to practice for as long as his/her surgical skills are objectively maintained at the appropriate level of competency.

Research perspectives

More studies need to evaluate the validity and reliability of these simulators for staff surgeons before even considering implementation.

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