RESULTS from the Cognitive Changes and Retirement among Senior Surgeons Self-Report Survey

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BACKGROUND: The Cognitive Changes and Retirement among Senior Surgeons (CCRASS) study suggested that although subjective cognitive awareness may play a role in surgeons’ retirement decisions, self-perceived cognitive decline did not predict objective cognitive performance. This article summarizes results from all participants who completed the survey portion of the CCRASS study.

STUDY DESIGN: A survey examining subjective cognitive changes, changes in caseload, involvement in new technology, and retirement decisions, was administered to 995 surgeons at annual meetings of the Clinical Congress of the American College of Surgeons between 2001 and 2006.

RESULTS: Forty-five percent reported increased caseload volume and 48% reported increased caseload complexity during the previous 5 years. In addition, 75% and 73% denied any recent changes in memory recall or name recognition, respectively. Increasing age was associated with decreases in clinical caseload and complexity. The majority of respondents across all age groups reported active participation in either learning (64%) or contributing (13%) to new technology in the field. Among surgeons with no imminent plans for retirement, 58% reported that a retirement decision will be based on skill level.

CONCLUSIONS: Increasing age was associated with decreases in caseload and case complexity. But a steady proportion of surgeons, even in the oldest age group, are active in new surgical innovations and challenging cases. Most reported no changes in perceived cognitive abilities. The majority of surgeons who had made no decision to retire reported that their decision will be based on skill level rather than age. (J Am Coll Surg 2009;209:668–671. © 2009 by the American College of Surgeons)

METHODS
Data collection
The CCRASS study was approved by the Institutional Review Board at the University of Michigan. Surgeons were recruited to participate in the study using video presentations in buses transporting congress attendees, announce-
ments in the Congress Newsletter, and signage. A booth was set up in the exhibition area at the ACS annual Clinical Congress meetings from 2001 to 2006. The self-report survey used in this study gathered subjective information about surgical practice, retirement decisions, changes in clinical practice, changes in cognitive functioning, and involvement in new surgical technology (Appendix, online). A total of 995 surgeons volunteered to complete the survey. Surgeons were given token novelty items for their participation (e.g., pocket knives, stress balls).

Statistical analysis
Analyses were performed using the SPSS Release for Windows, Version 15.0. Given the categorical nature of the study variables, the Cramer V statistic was used to calculate the strength of associations among these variables. Some surgeons elected to respond to only certain survey questions, so data from all 995 surgeons were not obtained for every variable of interest.

RESULTS
Demographic information
Table 1 displays demographic information of the surgeons in terms of gender, age, and clinical practice. The majority of surgeons participating in the study were male (88.8%) and more than half of them were aged 55 and older. Approximately 40% of the respondents worked in private or solo practice settings, 18% worked in group practice settings, and 30% worked in academic settings. A small percentage of the respondents worked in military settings, were students or residents, or were not in surgical practice.

Clinical practice and involvement in technology
Surgeons were asked about changes in clinical practice over the past 5 years, namely, changes in caseload volume and case complexity. Approximately 48% of respondents reported an increase in caseload volume, 25% reported no change, and 28% reported a decrease in volume. Similarly, 45% of respondents reported an increase in case complexity, 35% reported no change, and 20% reported a decrease in case complexity. Age was associated with both caseload volumes and case complexity ($V = 0.391$, $p < 0.0001$; $V = 0.384$, $p < 0.0001$), with increasing age associated with decreases in volume and complexity. For example, the majority of surgeons younger than 55 reported increases in caseload volume compared with less than 10% of individuals older than 65. Changes in caseload volumes and case complexity as a function of age group are represented in Figures 1 and 2.

Surgeons were also asked about their involvement in new technology in the field. Approximately 64% of all respondents reported active participation in learning to master these new innovations. Twenty percent of respon-

Table 1. Demographic and Practice Information

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Frequency, n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group, y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;35</td>
<td>133</td>
<td>13.37</td>
</tr>
<tr>
<td>35–44</td>
<td>129</td>
<td>12.96</td>
</tr>
<tr>
<td>45–54</td>
<td>186</td>
<td>18.69</td>
</tr>
<tr>
<td>55–65</td>
<td>309</td>
<td>31.06</td>
</tr>
<tr>
<td>&gt;65</td>
<td>238</td>
<td>23.92</td>
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<tr>
<td>Total</td>
<td>995</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
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<td></td>
</tr>
<tr>
<td>Female</td>
<td>102</td>
<td>11.17</td>
</tr>
<tr>
<td>Male</td>
<td>811</td>
<td>88.83</td>
</tr>
<tr>
<td>Total</td>
<td>913</td>
<td></td>
</tr>
<tr>
<td>Practice type</td>
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</tr>
<tr>
<td>Private</td>
<td>384</td>
<td>39.75</td>
</tr>
<tr>
<td>Group</td>
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<td>17.91</td>
</tr>
<tr>
<td>Academic</td>
<td>285</td>
<td>29.50</td>
</tr>
<tr>
<td>Military</td>
<td>46</td>
<td>4.76</td>
</tr>
<tr>
<td>Not practicing</td>
<td></td>
<td>1.45</td>
</tr>
<tr>
<td>Student/resident</td>
<td></td>
<td>6.63</td>
</tr>
<tr>
<td>Total (including one dual type)</td>
<td>966</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Changes in caseload volume across age groups.

Figure 2. Changes in case complexity across age groups.
dents reported merely being an “observer;” 13% reported contributing to technologic development. Involvement in technology varied by age group ($V = 0.131, p < 0.001$). For respondents 45 years of age and older, increasing age was associated with higher rates of observation and lower rates of active learning and contribution. Technology involvement as a function of age group is represented in Figure 3.

**Changes in perceived cognitive abilities**
The large majority of respondents reported that their memory recall and name recognition abilities had not changed over the past 5 years (75% and 73%, respectively). Not surprisingly, increasing age was associated with decreased memory recall ($V = 0.233, p < 0.001$) and name recognition ($V = 0.236, p < 0.0001$), as illustrated in Figures 4 and 5.

**Retirement decisions**
Decisions about when to retire were relatively variable, as seen in Figure 6. Although 15% of the total respondents reported already being retired, 23% reported that they were planning to retire within the next 5 years. Approximately 36% of respondents plan to retire when their skills deteriorate, as opposed to the 26% of respondents who plan to retire at a predetermined age.

**DISCUSSION**

This study reports the survey results of 995 surgeons regarding issues involving clinical practice, perceived cognitive changes, and retirement decisions. In general, the results of the survey are quite positive. A large proportion of surgeons reported an increase in clinical caseload and case complexity over the past 5 years. The majority of surgeons also denied any perceived changes in cognitive abilities. Unsurprisingly, increasing age was associated with decreased caseloads, a decrease in case complexity, and perceived cognitive decline. But even in the oldest age group, the majority of surgeons reported no change in the complexity of cases seen despite a decline in caseload volume. Another positive finding was that across age groups, the majority of surgeons reported being actively involved in new advances in the field. Although the tendency to be an observer in new technology increased with age, even in the oldest age group the majority of surgeons remained actively involved or they contributed to new technology. These findings optimistically suggest that the aging surgeon con-
continues to be active in new innovations and challenging cases.

Factors related to retirement decisions were mixed. Almost 40% of respondents had already retired or were planning imminent retirement. Of surgeons who had not yet made a decision to retire, almost 60% reported that their decision will be based on skill level rather than age. This suggests that perceived cognitive ability may play a large role in the retirement decision process. Although this study demonstrates that age can affect various components of clinical practice and perceived cognitive abilities, it should be noted that age is not invariably accompanied by significant cognitive decline. For example, even in the oldest age group, the majority of surgeons reported no perceived cognitive changes. But our previous study demonstrated that perceived cognitive changes were not predictive of objective cognitive performance in a subset of the current sample of surgeons.¹ This suggests that basing retirement decisions on a perceived decline in abilities may be misleading and can lead to both premature and belated decisions to retire. This illustrates the importance of developing objective measures of cognitive functioning to aid surgeons in their retirement decisions.

REFERENCE

Appendix

CCRASS

Self Report Survey

Subject #:

Age*:  
- □ 45-54
- □ 55-65
- □ >65

Sex:  
- □ Male
- □ Female

Type of Practice:  
- □ Private
- □ Group
- □ Academic
- □ Military/VA

Over the past 5 years:

1. The volume of cases that I manage has:
   - □ Increased
   - □ Decreased
   - □ Not changed

2. The complexity of cases I manage has:
   - □ Increased
   - □ Decreased
   - □ Not changed

3. My recall has:
   - □ Not changed
   - □ Deteriorated

4. My name recognition has:
   - □ Not changed
   - □ Deteriorated

5. Regarding new technology in my field (e.g., laparoscopy, endovascular, etc.), I have:
   - □ Been an observer
   - □ Actively learned to master it
   - □ Contributed to the further development

6. In my recreational sports activities (skiing, tennis, team sports), I have:
   - □ Maintained or increased the level and intensity
   - □ Reduced the level and intensity
   - □ Abandoned one or more activities in favor of less demanding recreation
7. In order to read the newspaper, I:
   - [ ] Read without assistance
   - [ ] Take off my distance glasses
   - [ ] Use bifocals or reading glasses

8. I plan to retire:
   - [ ] Currently retired
   - [ ] Within the next 5 years
   - [ ] When I reach a predetermined age
   - [ ] When I feel my skills are deteriorating

9. In the past 12-24 hours, how many alcoholic drinks have you had (drink = one 12 oz.
   beer, one 4 oz. glass or wine, or 1 oz. shot of liquor).
   - [ ] 0 drinks  [ ] < 3 drinks  [ ] < 6 drinks  [ ] > 6 drinks

10. At the present time (past 24 hours) I am taking (check all that apply):
    - [ ] No medications  [ ] Pain medication (controlled)
    - [ ] Sedative  [ ] Muscle Relaxant
    - [ ] Anti-depressant  [ ] Tranquilizer

11. Are you presently fatigued?
    - [ ] Not  [ ] Moderate  [ ] Very

*The first version of the survey contained ages groups <35 and 35-44.