Changes in General Surgery Training

The Postgraduate Course in General Surgery

March 20-23, 2011

Jonathan Carter, MD
Assistant Professor of Surgery

Residency Training

The Past
100 years of surgeon-making

The Present
ACGME work-hours
Surgeon specialization and resident perceptions

The Future
ACGME 2011 work-hours
New models of residency training
Origin of residency system in the United States

• Started in 1889 by Halsted and Osler at Johns Hopkins Hospital

• Modeled after German model of medical training.

• Interns and residents lived in the hospital for the duration of their training

• Residents were expected to make a total commitment to hospital work and patient care
  Marriage was disallowed.
  Interns took every other night call.
  No vacation time
  None or little pay.
  Responsibility was graduated as rank increased from intern to junior resident to senior resident to chief.

• By the 1940s, this system was widespread across the U.S.

“[residency] selects out people who have stamina, who can perform under pressure. The strong survive. After a residency, that’s one tough surgeon”
– Chair of Surgery at a prominent institution

Training at MGH in 1992
The Q2 resident call schedule in general surgery at MGH in 1992

<table>
<thead>
<tr>
<th>Day</th>
<th>On Call Hours</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Sat</td>
<td>6 am to Mon 6 pm</td>
<td>60</td>
</tr>
<tr>
<td>2) Tues</td>
<td>6 am to Weds 6 pm</td>
<td>36</td>
</tr>
<tr>
<td>3) Thurs</td>
<td>6 am to Sat 6 am</td>
<td>48</td>
</tr>
<tr>
<td>4) Mon</td>
<td>6 am to Tues 6 pm</td>
<td>36</td>
</tr>
<tr>
<td>5) Weds</td>
<td>6 am to Thurs 6 pm</td>
<td>36</td>
</tr>
<tr>
<td>6) Fri</td>
<td>6 am to Fri 6 pm</td>
<td>12</td>
</tr>
</tbody>
</table>

228 hours in-house in 2 weeks = 114 hour workweek

Also — pre-rounds usually began at 4:45 am — often earlier

Libby Zion

18 year-old daughter of NYC journalist and former federal prosecutor Sidney Zion.

Admitted October 4, 1984 to NY Hospital Cornell Medical Center with high fever, agitation, and “strange jerking motions.”

Admitted by Luise Weinstein (PGY1) and Greg Stone (PGY2). Diagnosis was not clear: “viral syndrome with hysterical symptoms.” Admitted for observation, given demerol for shaking. Raymond Sherman (attending) informed of admission via phone.

Libby became more agitated. Weinstein ordered physical restraints, then haldol without re-evaluating the patient. Stone unaware. Sherman unaware.

Libby then developed fever to 107, then cardiac arrest. Died after a total of 7 hours later of serotonin syndrome caused by a combination of phenelzine (MAO inhibitor), demerol, and possibly cocaine.

- Washington Post, November 28, 2006
1989 Bertrand Bell heads blue ribbon panel at request of NY Health Commissioner. Bell Commission criticizes lack of resident supervision and work hours. NY State adopts Code 405—limiting resident work hours to 80 hours a week and 24 consecutive hours and requiring supervising physician to be within 30 min.

Many institutions disregarded Code 405.

1994 – Zion vs. NY Hospital. Defense argued Libby died of cocaine ingestion she had concealed from her doctors. Sidney Zion awarded $375,000. Jury declined to indict residents and attendings involved, but strongly criticized the supervision of interns and junior residents.

- Washington Post, November 28, 2006

<table>
<thead>
<tr>
<th></th>
<th>UK</th>
<th>Netherlands</th>
<th>Denmark</th>
<th>France</th>
<th>Germany</th>
<th>Ireland</th>
<th>Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>How hours are regulated</td>
<td>Ministerial agreements</td>
<td>National legislation</td>
<td>Legislation and collective agreement</td>
<td>N/A</td>
<td>Collective agreement</td>
<td>N/A</td>
<td>Regional legislation</td>
</tr>
<tr>
<td>Maximum hours/week</td>
<td>56, averaged</td>
<td>48; averaged; max of 60 in any one week</td>
<td>Not regulated, but avg=45</td>
<td>Not regulated; avg=50+ on-call hours</td>
<td>56 hours averaged over 24 weeks</td>
<td>65; however often exceeded</td>
<td>68-75</td>
</tr>
<tr>
<td>Maximum hours/shift</td>
<td>16-24</td>
<td>24</td>
<td>N/A</td>
<td>N/A</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Minimum hours between shifts</td>
<td>8-12</td>
<td>10</td>
<td>8-11</td>
<td>No restrictions</td>
<td>10</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

- Europe: EWTD limited all nurses and physicians-in training to maximum of 13 hours per shift and 58 hours per week in 1998. In 2009, a 48-hour work week took effect.
The 1990s: a barrage of sleep deprivation research...

1991: (JAMA) 41% of residents cited fatigue as the cause of their most serious mistake

1997: (Nature) 24 hours of wakefulness akin to a BAC of 0.1 percent

1998: Europe and the UK enact EWTD, restricting MD and RN work hours to 13 consecutive hours per day and 56 hours per week.

2002: (Annals of Internal Medicine) 75% of residents suffered burnout, emotional exhaustion, detachment from patients

1999: Institute of Medicine: medical errors cause 44,000-98,000 deaths a year. In the public outcry, federal legislation drafted in House or Representatives (John Conyers D-Mich) and Senate (John Corzine D-NJ). CIR submits petition to OSHA for work hour limits.

2003: Pre-empting federal legislation, ACGME mandates work-hours reform.

1. Work hours limited to 80 hours per week, averaged over 4 weeks.
2. Shift hours limited to 24 hours, with up to 6 additional hours for hand-off or education.
3. One day in 7 (24 hours) free from patient care and education, averaged over 4 weeks.
4. In house call no more than every third night averaged over 4 weeks.
5. At least 10 hours off between shifts.

Review of 11,518 trauma patients at LA County 1998-2005

Divided into 2 groups: pre and post 80 hour workweek.

80-hour workweek accomplished with:
- hiring of 5 NPs
- more formal educational program
- reading assignments and ABSITE testing

Conclusions:
- volume and ISS scores increased
- morbidity and mortality rates were unchanged
- ABSITE and Board Pass rates were unchanged
- Total case volume increased, chief resident volume unchanged
- Increased institutional costs

Retrospective studies....

The 80-Hour Resident Workweek Does Not Adversely Affect Patient Outcomes or Resident Education

Chiraz de Vigil, MD, Anwar Yaghoubian, BS, Roger J. Lewis, MD, Bruce S. Sladé, MD, and Aaron H. Powrego, MD

*Department of Surgery, Los Angeles Biomedical Research Institute, and Department of Emergency Medicine, Harbor-UCLA Medical Center, Torrance, California

CURRENT SURGERY 2006 APDS SPRING MEETING

CONCLUSIONS: Despite concerns that the 80-hour workweek might threaten patient care and resident education, the morbidity and mortality rates at a busy level I trauma center remained unchanged. The quality of surgical resident education, as measured by operative volumes, ABSITE scores, and written and oral board examination pass rates were likewise unchanged. The reorganization of the authors' general surgery residency program to comply with the duty hour restrictions was achieved within reasonable cost. (Curr Surg 63:435-439. © 2006 by the Association of Program Directors in Surgery.)
Systematic Review: Effects of Resident Work Hours on Patient Safety

Kathryn E. Retcher, MD, MSc; Steven Q. Davis, MD; Willie Underwood, MD, MSc; Rajesh S. Mangalilal, MD; Laurence F. McMahon Jr., MD, MPH; and Sanjay Satel, MD, MPH

Background: The Accreditation Council for Graduate Medical Education (ACGME) mandated new work hours rules for all residency programs in July 2003.

Purpose: To critically evaluate the evidence that adhering to the ACGME standards will improve patient safety.

Data Sources: Searches of electronic databases (MEDLINE, EMBASE, PREMEDLINE, and Current Contents) and other methods to identify the English-language literature for studies on resident work hours for the years 1996 to 2004.

Study Selection: Studies that assessed a system change designed to counteract the effects of reduced work hours, fatigue, or sleep deprivation and that included an outcome related to patient safety were included. Seven studies met these criteria.

Data Extraction: Two investigators abstracted data from all included studies by using a standard data abstraction form; each study was rated according to established criteria to assess study design quality.

Data Synthesis: Interventions used were fluid systems, other cross-coverage systems, or unexpected schedule changes. Outcomes included mortality, adverse events, and medication errors. The results suggest that introducing such interventions has an unclear impact on selected patient safety indicators. Specifically, some indicators (such as mortality) may not change after interventions, while other indicators may improve or worsen.

Limitations: This analysis is limited by the study designs of the included studies, the diversity of interventions in the studies, and the possibility of publication bias favoring studies that demonstrated statistically significant differences.

Conclusion: Evidence on patient safety is insufficient to inform the process of reducing resident work hours.

Cumulative Operative Experience Is Decreasing During General Surgery Residency: A Worrisome Trend for Surgical Trainees?

John C. Kariya, MD, Kandace McGuire, MD; Albert G. Crawford, PhD; Charles J. You, MD, FACS

Review of national ACGME case logs from 1992-2006

Small reduction in number of procedures per resident after 2003 reported.

![Graph showing decrease in procedures per resident](chart.png)
The Impact of the 80-Hour Resident Workweek on Surgical Residents and Attending Surgeons

Matthew M. Rutler, MD, MPH, *† Katherine C. Kellogg, PhD, ‡ Charles M. Ferguson, MD,*
William M. Abbott, MD, *† and Andrew L. Warskau, MD*†

Objectives: To assess the impact of the 80-hour resident workweek restrictions on surgical residents and attending surgeons.

Summary Background Data: The Accreditation Council for Graduate Medical Education’s (ACGME) mandated resident duty hour restrictions have required major workflow restructuring. The impact of these changes needs to be critically examined for both surgical residents and attending surgeons.

Conclusion: Although the mandated restriction of resident duty hours has had no measurable impact on the quality of patient care and has led to improvements for the current quality of life of residents, there are many concerns with regard to the training of professional, responsible surgeons for the future.

<table>
<thead>
<tr>
<th>TABLE 4.</th>
<th>Web-Based Survey Results Showing Attending Surgeons’ Perceptions on the Impact on the Surgical Interns Due to the 80-Hour Workweek Restructuring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compared to Last Year's Categorical Interns at This Point in the Year, This Year's Categorical Interns Have Either:</td>
<td>Before</td>
</tr>
<tr>
<td>Technical skill</td>
<td>3.75</td>
</tr>
<tr>
<td>Clinical judgment</td>
<td>3.67</td>
</tr>
<tr>
<td>Sense of responsibility for the patient</td>
<td>3.50</td>
</tr>
<tr>
<td>Preparations for cases</td>
<td>3.63</td>
</tr>
<tr>
<td>Efficiency</td>
<td>3.57</td>
</tr>
</tbody>
</table>

*† Values are presented from before the work-hour changes (2003), as compared to 1 year after the changes (2004)
† Scale: 1, much worse; 3, the same as the year before; 5, much better.
Handoffs became a major focus of ACGME and Joint Commission…

The loss of continuity of care, and the loss of critical information with each handoff, was another recurrent theme as a byproduct of the work-hour changes. As stated by one attending, “It’s like the game ‘telephone’… where I tell the intern in the morning, and they sign it out to the PA (physician assistant) and the PA now reports it back to me. But there is something that invariably gets missed there.” An almost identical comment came from a senior resident.

**Transfer of clinical load to others**

**Surgeon Workhours in the Era of Limited Resident Workhours**

Emily R Winslow, MD, Michele C Bowman, Mary E Klingensmith, MD

| BACKGROUND: | Resident workhours have received much attention, yet there is little information concerning faculty workhours. In addition, the perspectives of surgical faculty on the anticipated effects of reducing resident hours have not been studied. |
| STUDY DESIGN: | An anonymous survey was distributed to all clinical faculty in the Departments of Surgery, Neurosurgery, Orthopaedics, and Otolaryngology at a single, large academic institution. Surgeons completed a detailed retrospective report of hours worked during a 1-week period. Opinions regarding resident workhour restrictions were also elicited. Chi-square or Student’s t-tests were used to determine p values as appropriate, with p ≤ 0.05 considered significant. |
| RESULTS: | Of 120 surveys distributed, 102 (85%) were returned. Subspecialty departments comprised 54% of respondents vs. 49% from general surgeons. The mean number of hours worked per week by faculty was 76.4 ± 12.3 (SD) (73.8 ± 14.1 for general surgeons versus 77.1 ± 9.9 for subspecialists, p < 0.0006), with only 44% having at least 1 day per week free from clinical duties. Up to 99% of general surgeons are paged overnight at least once per week (mean 13.0 ± 11.2 calls/week), with 73% returning from home at least once during the week (mean 1.8 ± 1.1 returns/week). Importantly, 84% of general surgeons believe reducing resident workhours will increase faculty hours, compared with 57% of subspecialists (p = 0.004). In addition, 87% predict that reducing resident hours will compromise surgical education, with only 13% believing the benefits of hour reduction will outweigh the negatives. |
| CONCLUSIONS: | The recommended limit for resident workhours closely approximates the average number of hours worked by surgical faculty in an academic center. Despite this, significant concerns exist among the majority of surgical faculty regarding the impact of resident workhour restriction, both on faculty workhours and on resident education. (J Am Coll Surg 2004;198:113-117, © 2004 by the American College of Surgeons) |
the Present

Congress asks IOM to form a consensus committee to recommend ways to improve conditions for residents, ensure education, and maintain patient safety.

2007

IOM releases “Resident Duty Hours: Enhancing Sleep, Supervision, and Safety.” Estimated cost to implement = $1.7 billion.

2008

Table 1. Comparison of Institute of Medicine (IOM) committee recommendations to current Accreditation Council for Graduate Medical Education (ACGME) duty hour limits.

<table>
<thead>
<tr>
<th>2007 ACGME Duty Hour Limits</th>
<th>2007 ACGME Duty Hour Limit</th>
<th>IOM Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum work per week, h</td>
<td>80, averaged over 4 wk</td>
<td>No change</td>
</tr>
<tr>
<td>Minimum shift length, h</td>
<td>30 (excluding patients up to 24, then 3 additional for nonsurgical and educational activities)</td>
<td>30 after day shift; 12 after night shifts</td>
</tr>
<tr>
<td>Minimum time off between scheduled shifts, h</td>
<td>9.5 after shift length</td>
<td>10 after day shift; 12 after night shift; 11 after any extended duty period of 30, and no return until 6.25 hours after</td>
</tr>
<tr>
<td>Minimum in-hospital overnight Frequency</td>
<td>Every third night, no averaging</td>
<td>No change</td>
</tr>
<tr>
<td>Minimum time off between overnight changes, h</td>
<td>10 after shift length</td>
<td>10 after day shift; 12 after night shift; 11 after any extended duty period of 30, and no return until 6.25 hours after</td>
</tr>
<tr>
<td>Minimum frequency of in-hospital night shifts</td>
<td>Not addressed</td>
<td>No change</td>
</tr>
<tr>
<td>Mandatory time-off days</td>
<td>4 off per month, 8 hr (24-hr) off per wk, averaged over 4 wk</td>
<td>4 off per month, 8 hr (24-hr) off per wk, averaged over 4 wk</td>
</tr>
<tr>
<td>moonlighting</td>
<td>Interns must not moonlight in the evening against fifth, sixth, and seventh hours</td>
<td>Interns must not moonlight in the evening against fifth, sixth, and seventh hours</td>
</tr>
<tr>
<td>Limit for exceptions, h</td>
<td>88 for extant programs with a sound educational rationale</td>
<td>No change</td>
</tr>
<tr>
<td>Emergency cross limits</td>
<td>12 hr shift limits, at least an equivalent period of time off between shifts, 60 hr work week with additional 12 hr for education</td>
<td>No change</td>
</tr>
</tbody>
</table>

Van Eaton, Surgery 2011
ACGME broadly challenged IOM report, particularly IOM’s call for third-party oversight of resident work-hours. Many others, including ABS, rebutted the IOM recommendations.

Congress on Residency Training Convened
>140 organizations submitted position papers
>70 organizations testified, including,
  American College of Surgeons
  American Association of Program Directors in Surgery
  Committee of Interns and Residents
  The Veterans Affairs National Center for Patient Safety
  The Greater New York Hospital Association
  The Joint Commission (JCAHO)
  3 members of the original IOM committee

ACGME issues open letter regarding work of Duty Hours Task Force:
•lack of data that duty restrictions improves patient safety
•countries with more stringent work hours also have supervision past residency training
•competence of U.S. recent graduates yet to be evaluated
•Called for substantial, not absolute compliance

ACGME Board of Directors approves new standards for residency work hours based upon IOM report and 2009 Congress on Residency Training

Formal petition to have the Occupational Safety and Health Administration (OSHA) regulate resident and intern duty hours filed by:
  Committee of Interns and Residents
  Employees International Union Healthcare Division
  American Medical Student Association
  some experts in sleep medicine

SB133/HR1228: Hospital Patient Protection Act: would limit work hours to 80 hours per week and 24 hours per shift absolute (no averaging allowed). Provides for whistleblower protection and civil penalties for failure to comply.

Full implementation of new ACGME duty hours rules
Meanwhile, the face of general surgery is changing…..

80% of general surgery graduates choose specialty training (i.e. they feel need for additional training)

50% increased failure rate on ABS Certifying Exam

There is less open surgery to train
transition to laparoscopic surgery
65% less penetrating trauma since 1992
elimination of gastric surgery
elimination of biliary tree and PV surgery

Harder to attract top medical students
nadir in 2001

Lifestyle / controllable practice is MUCH more important to new generation of physicians…..

As Doctors Get a Life, Strains Show

U.S. medicine is in the middle of a cultural revolution, as young physicians intent on balancing work and family challenge the assumption that a doctor should be available to treat patients around the clock.

Walter Cheng, 32 years old, is in the profession’s new guard. Upon graduating from the Johns Hopkins School of Medicine in 2004, he bristled at the notion espoused by some senior physicians that a doctor should put medicine above all else. “I thought, ‘I don’t really want to be that kind of doctor… My family is as important, if not more important, than my career.”

That philosophy influenced Dr. Cheng’s job search. Later this year, he plans to go to work as a hospitalist, an emerging breed of doctor that focuses on the general care of hospitalized patients. He was attracted to the job, at California Pacific Medical Center in San Francisco, by the intellectual challenge of treating acutely ill patients who wind up in the hospital. Another big draw: a predictable schedule. “You come in at a certain hour. When you leave, your pager turns off,” he says.

In a 2006 survey conducted by physician-staffing firm Merritt, Hawkins & Associates, 63% of medical residents said the availability of free time was causing them “a significant level of concern” as they entered the profession, up from 15% in 2001.

While quality-of-life issues have been long festering for physicians, today’s medical field is more accommodating. Younger doctors’ attitudes are giving rise to different types of practice options. These range from small, membership-based primary-care facilities to hospital-specific jobs that keep doctors on predictable schedules.

At the same time, the attempt by new doctors to lead a less-pressured work life is putting additional strain on America’s health-care system. Many are eschewing fields such as internal medicine, pediatrics and family medicine, choosing instead specialties that offer both higher pay and more predictable work hours. In family medicine, for example, hundreds of medical residency positions go unfilled every year. But competition for slots in dermatology residencies is fierce.
Residents and attendings should inform patients of their role in the patient’s care.

Faculty functioning as supervising physicians should delegate portions of that care to resident physicians. Senior residents or fellows should serve in a supervisory role of junior residents.

The privilege of progressive responsibility in patient care delegated to each resident must be assigned by the program director and faculty.

The resident is responsible for knowing the limits of his/her scope of authority.

Programs must set guidelines for circumstances and events where residents must communicate with appropriate supervising physicians.

Faculty supervision assignments should be of sufficient duration to assess the knowledge and skills of the resident and delegate the appropriate level of patient care authority and responsibility.

In particular, during the PGY 1 year, residents must have supervision level 1 or 2a (see below).

**Levels of Supervision.** In the development and description of systems to oversee resident supervision and graded authority and responsibility, each program must use the following classification of supervision.

1. **Direct Supervision** — The supervising physician is physically present with the resident and patient.

2. **Indirect Supervision:**
   a. Direct supervision immediately available — The supervising physician is physically within the confines of the site of patient care, and immediately available to provide Direct Supervision.
   b. Direct supervision available — The supervising physician is not physically present within the confines of the site of patient care, is immediately available via phone, and is available to provide Direct Supervision.

3. **Oversight:** The supervising physician is available to provide review of procedures/encounters with feedback provided after care is delivered.
• Programs must design clinical assignments to minimize the number of transitions in patient care.

• Institutions and programs must ensure and monitor effective, structured handover processes to facilitate both continuity of care and patient safety.

• Programs must ensure that residents are competent in communication with team members in the handover process.

• Institutions must assure the availability of schedules that inform (patients and) all members of the health care team of faculty and residents currently responsible for patient care. Residents and attendings should inform patients of their role in the patient’s care.

ACGME 2011 work hour rules

**TIME OFF**

• PGY-I residents should have 10 hours, and must have 8 hours, free of duty between scheduled duty periods.

• Intermediate-level residents, as defined by the RRC, should have 10 hours free of duty, and must have 8 hours between scheduled duty periods. They must have at least 14 hours free of duty after 24 hours of in hospital duty.

• Residents in the final years of education should have 10 hours free of duty, and must have eight hours between scheduled duty periods. However, residents must be prepared to enter the unsupervised practice of medicine and care for patients over irregular or extended periods. Under circumstances defined and approved by the Review Committee, residents in their final years of training (as determined by the Review Committee) may be permitted to return to duty with fewer than eight hours between in-hospital activities. This must occur only within the context of the 80-hour and one day off in seven standards.

• Circumstances of return to hospital activities with fewer than eight hours away from the hospital by residents in the final years of training must be monitored by the program director.
ACGME 2011 work hour rules

TIME OFF

- Residents must not be scheduled for more than 6 consecutive nights of night duty (night float).
- 24 hrs off per 7 day period, (when averaged over 4 weeks). Home call cannot be assigned on these free days.
- Internal and external moonlighting must count towards the 80 hour limit
- PGY-I residents must not be permitted to moonlight at all
- Time spent in the hospital by residents on at-home call must count towards the 80-hour maximum weekly hour limit. The frequency of at-home call is not subject to the every-third-night limitation.
- At-home call must not be so frequent or taxing to preclude rest or reasonable personal time for each resident.
- Residents are permitted to return to the hospital while on at-home call to care for new or established patients. Each episode of this type of care, while it must be included in the 80-hour weekly maximum, will not initiate a new "off-duty period."

New models of training...
Implementation and Evaluation of a New Surgical Residency Model

Joseph R Schneider, MD, FACS, PhD, John J Coyle, MD, FACS, Elizabeth R Ryan, EdD, Richard H Bell Jr, MD, FACS, Debra A DaRosa, PhD

“Think Tank” convened at Northwestern to brainstorm new residency models

Redefined models of training:

“Apprentice” model: resident works exclusively with 1 or 2 attendings.
“Mastery” model: cases assigned by resident’s educational needs.
“Float” model: traditional team model, but with float coverage.

Entire surgical residency at Northwestern re-designed using a combination of models.

Outcome = survey of residents, ABSITE scores, case volume

Table 4. Comparison of Apprentice to Team Rotations after Initiation of New Curriculum

<table>
<thead>
<tr>
<th>Item</th>
<th>Target range</th>
<th>Apprentice rotations</th>
<th>Team rotations</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>n (range)</td>
<td></td>
<td>193–238</td>
<td>415–711</td>
<td></td>
</tr>
<tr>
<td>Case load</td>
<td>2.5–3.5</td>
<td>3.37 ± 0.80</td>
<td>2.90 ± 1.11</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Complexity</td>
<td>2.5–3.5</td>
<td>3.42 ± 0.73</td>
<td>3.36 ± 0.96</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Involvement</td>
<td>2.5–3.5</td>
<td>3.24 ± 0.95</td>
<td>3.09 ± 1.06</td>
<td>0.006</td>
</tr>
<tr>
<td>Supervision wards</td>
<td>2.5–3.5</td>
<td>3.42 ± 0.78</td>
<td>3.38 ± 0.88</td>
<td>0.567</td>
</tr>
<tr>
<td>Supervision OR</td>
<td>2.5–3.5</td>
<td>3.57 ± 0.81</td>
<td>3.47 ± 0.87</td>
<td>0.137</td>
</tr>
<tr>
<td>Supervision clinic</td>
<td>2.5–3.5</td>
<td>3.48 ± 0.80</td>
<td>3.36 ± 0.91</td>
<td>0.086</td>
</tr>
<tr>
<td>Teaching rounds</td>
<td>≥ 3.0</td>
<td>4.02 ± 1.02</td>
<td>3.45 ± 1.18</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Teaching conferences</td>
<td>≥ 3.0</td>
<td>4.05 ± 1.01</td>
<td>3.79 ± 1.06</td>
<td>0.003</td>
</tr>
<tr>
<td>Teaching OR</td>
<td>≥ 3.0</td>
<td>4.35 ± 0.89</td>
<td>3.81 ± 1.09</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Teaching clinic</td>
<td>≥ 3.0</td>
<td>4.31 ± 0.88</td>
<td>3.77 ± 1.11</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Encouraged to attend . . .</td>
<td>≥ 4.0</td>
<td>4.33 ± 0.85</td>
<td>4.21 ± 1.08</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Rotation objectives met</td>
<td>≥ 4.0</td>
<td>4.48 ± 0.81</td>
<td>4.02 ± 1.03</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Learning environment</td>
<td>≥ 4.0</td>
<td>4.47 ± 0.92</td>
<td>3.95 ± 1.15</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Overall</td>
<td>≥ 3.5</td>
<td>4.45 ± 0.82</td>
<td>3.80 ± 1.09</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Continuity (preoperative)</td>
<td>≥ 2.5</td>
<td>3.09 ± 0.96</td>
<td>2.79 ± 1.27</td>
<td>0.001</td>
</tr>
<tr>
<td>Continuity (postoperative)</td>
<td>≥ 2.5</td>
<td>3.28 ± 0.90</td>
<td>2.60 ± 1.30</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

ABSITE scores same or improved for all PGY levels

Case volume greater for PGY1 and 2. Worse for PGY3. Same for PGY4 and 5

No difference in overall morbidity and mortality
Residency training in surgery in the 21st century: A new paradigm

Carlos A. Pellegrini, MD, FACS, Andrew L. Warshars, MD, FACS, and Halle T. Debas, MD, FACS, Seattle, Wash; Cambridge, Mass; and San Francisco, Calif

Proposed Schema for Restructured Surgical Residency Training

- Basic Surgical Care (2-3 yr)
  - National Certifications
  - Basic Surgical Skills
  - Professionalism, ethics, practice management

- Verification of Competence (no certification)

- Specialist in General Surgery* (3 yr)
  - Urban Track
  - Rural Track

- Sub-specialty in Surgery* (3 yr)
  - Cardiothoracic
  - Plastic
  - Vascular
  - Trauma Surgery, Critical Care
  - Pediatric
  - Colon-rectal
  - Surgical Oncology

- Research or Advanced Degree (optional)

- Junior Faculty Appointment (optional)

- Early exposure—1-2 mo

Certify in GS after 5 yr

Certify in specialty after 6 yr

At conclusion of training, will have had 48 months of GS and 24 months of specialty

Same as present model of ESP

Addresses all of the practical constraints

Frank Lewis, ABS

“Straw Man” Model to consider for surgical training

<table>
<thead>
<tr>
<th>PGY</th>
<th>GS/Sp</th>
<th>Early exposure—1-2 mo</th>
<th>Certify in GS after 5 yr</th>
<th>Certify in specialty after 6 yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGY-1</td>
<td>GS</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>PGY-2</td>
<td>GS</td>
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<tr>
<td>PGY-3</td>
<td>GS</td>
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<td>PGY-4</td>
<td>GS</td>
<td>specialty-4 mo</td>
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<td>PGY-5</td>
<td>GS</td>
<td>specialty-8 mo</td>
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<tr>
<td>PGY-6</td>
<td>specialty-12 mo</td>
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</tbody>
</table>

*Requires Board Certification
Proof of competency

ACGME 6 competencies
Objective Structured Clinical Examination (OSCE) 1970s
Objective Structured Assessment of Technical Skills (OSATS) 1997
Fundamentals of Laparoscopic Surgery (FLS)
Fundamentals of Endoscopic Surgery (FES)
Global Assessment of Gastrointestinal Endoscopic Skills (GAGES)