

**General Surgery in the Era of Subspecialty
and Acute Care Surgery
(aka Redesign of Surgical Residency)**

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Disclaimer

The opinions expressed are my own, and are not reflective of any actions, positions, or decisions of the American Board of Surgery.

Short Quiz

- How many different clinical specialty fellowships (ACGME accredited and non-accredited) are regularly available to residents after completing 5 yr GS residency?
 - 5-10
 - 10-15
 - 15-20
 - 20-25

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 - 20-25 – Correct answer = 22

ABMS/ACGME Accredited Specialties

- ABS Specialties
 - Vascular
 - Peds Surgery
 - Surgical Critical Care
 - Surgery of the Hand
 - Hospice/Palliative Care
 - Complex GS Oncology
- Other ABMS Boards
 - Colon-Rectal (ABCRS)
 - Thoracic (ABTS)
 - Plastics (ABPS)

Non-ACGME Fellowships

- Acute Care/Trauma (AAST)
- Breast (ASBS)
- Burns (ABA)
- Endocrine (AAES)
- Transition to Practice (ACS)
- Transplant (ASTS)
- GI (Fellowship Council)
 - UGI (SAGES/SSAT)
 - Hepatobiliary (AHPBA)
 - Pancreatic (AHPBA)
 - Bariatric (ASMBS)
 - Colon-Rectal (non-cert)
 - Thoracic (non-cert)

Increasing drumbeat of criticism of surgical residency training

- Not a new issue: Multiple discussions at the ABS in 1980's in regard to "saving general surgery". Focus on specialization v. GS
- Classic paper by H. Brownell Wheeler, May 1993 ACS Bulletin, "Myth and Reality in General Surgery".
He pointed out the limited number of complex cases and the small volume of resident experience in all but the most common cases. He noted that specialization was inevitable and may be desirable.
- ABS data shows that fail rate on GS oral exam increased from 14.6% in 2003 to 28.4% in 2012. Written exam failures unchanged.
- Recent publications have broadened the criticisms beyond case volume to attitudinal issues and inability to function independently in post-residency fellowships.

General surgery residency inadequately prepares trainees for fellowship

SG Mattar, AA Alseidi, DB Jones, et al
Ann Surg 2013; 258:440-9

- Surveyed Fellowship Council fellowship directors (63% response-156 programs, 210 fellows/yr)
- Conclusions
 - 30% could not independently perform lap chole
 - 66% were unable to operate unsupervised for 30 min of major procedure
 - Laparoscopic skills:
 - 30% could not atraumatically manipulate tissue
 - 26% could not recognize anatomic planes
 - 56% could not suture
 - 24% unable to recognize early signs of complications
 - 38% demonstrated lack of patient ownership
 - >50% unable to conceive, design, conduct research studies

Mattar article analysis

- Mattar et al specifically looked at evaluations of residents at the end of five years of training on entry into fellowship.
- There have been no similar critiques/evaluations of residents after 1-3 yr of post-residency fellowship.
- Does the fellowship experience – focused in a specialized area, with greater experience in complex procedures and an opportunity for autonomy and independence, solve the problem?
- If so, the problem we need to fix is the 20% who do not do fellowships, not the 80% who do.

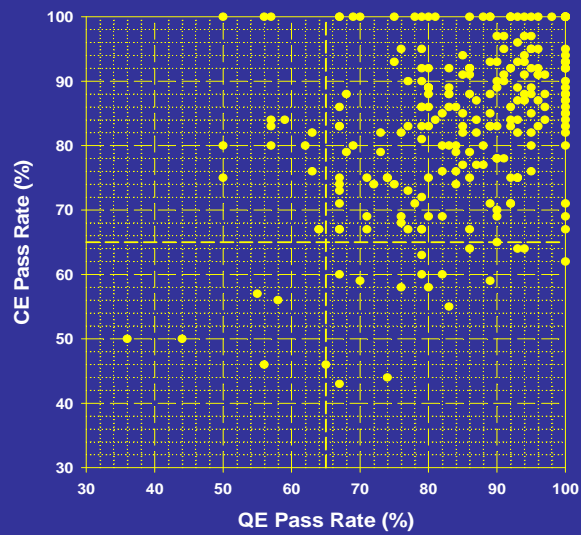
Current Issues with General Surgical Residency

- Reduced surgical exposure/experience in medical school
- Highly variable teaching effectiveness at different institutions; significant dependence of training outcomes on program size
- Reduced breadth and complexity of resident operative experience
- Impact of 80 hour work week
- Reduced opportunity for autonomy and independent decision making at senior levels

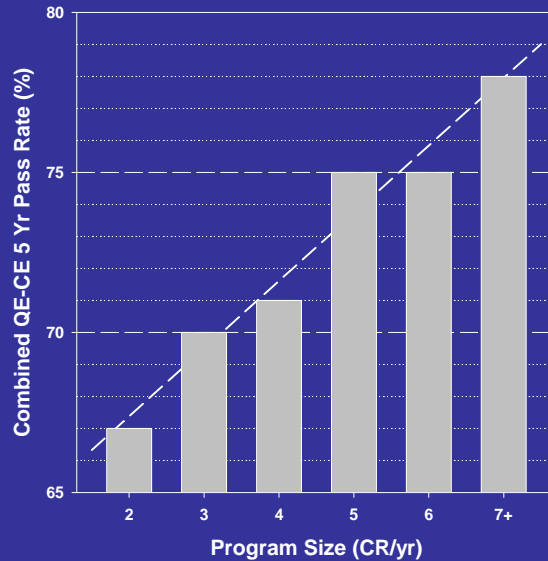
- Inadequate surgical exposure/experience in medical school

- Rotational time on surgical services reduced to 4-8 weeks, often with little GS
- Medical students rarely given direct patient care responsibility; function more as spectators than acting interns
- Uncommon for medical students to take night call or obtain realistic experience in dealing with patients
- Basic procedural skills are usually lacking

Five Yr Avg Pass Rate Data
All Residency Programs



Effect of Program Size on ABS Combined QE-CE First Time Pass Rate



Evolution of Surgical Procedures

- Reduction in volume and breadth of open abdominal surgery
 - Laparoscopic v. open surgery
 - Open surgery has markedly decreased but has not been replaced by comparable laparoscopic surgery. Dramatic increase in post-residency fellowships creates competition for cases
 - Reduction in trauma operative experience
 - 65% reduction in penetrating trauma 1992-2002
 - Seatbelts, airbags, safer cars reduced blunt trauma deaths 20%
 - CT scanning for abd diagnosis has replaced exp lap
 - Use of nonoperative management for most liver, many splenic injuries
 - RRC minimum standard is only 10 open trauma cases

Evolution of Surgical Procedures

- Reduction in volume and breadth of open abdominal surgery
 - Near elimination of peptic ulcer disease and related gastric surgery
 - Rx of Helicobacter
 - Acid blockers
 - Elimination of biliary tree and portal vein surgery
 - ERCP, TIPS, percutaneous transhepatic techniques have eliminated need for most common duct and portal vein procedures
 - Endovascular revolution has markedly reduced open vascular procedures and has largely removed GS residents from traditional vascular surgery experience

Summary of Operative Changes

- Near elimination of:
 - Benign gastric and duodenal ulcer operative procedures
 - Biliary tree procedures
 - Portal vein procedures
 - Abdominal vascular procedures
- 70-80% reduction in abdominal trauma operations
- Conversion of 50-70% of remaining open abdominal procedures to laparoscopic but dramatic expansion of fellowships creates competition for high end cases.
- The above has fundamentally changed the character of general surgery but has attracted little comment in the literature.

Impact of the 80 hr week

- $100 \text{ hr/wk} \times 48 \text{ wk} \times 5 \text{ yr} = 24,000 \text{ hr}$
- $90 \text{ hr/wk} \times 48 \text{ wk} \times 5 \text{ yr} = 21,600 \text{ hr}$
- $80 \text{ hr/wk} \times 48 \text{ wk} \times 5 \text{ yr} = 19,200 \text{ hr}$

- $100 \gg 80 = 4,800 \text{ hr reduction} = 48\text{-}100 \text{ hr weeks}$
- $90 \gg 80 = 2,400 \text{ hr reduction} = 24\text{-}100 \text{ hr weeks}$

- Monday-Friday daytime activity – $12 \text{ hr/d} \times 5 \text{ d} = 60 \text{ hr/wk}$
- With 100 hr/wk , 40 hr left for night/weekend activity
- With 80 hr/wk , 20 hr left for night/weekend activity

Impact of the 80 hr week

- Conclude
 - The 80 hr week has taken 6 – 12 months of in-hospital clinical experience out of surgical residency.
 - The reduction has been mostly in night/weekend experience, which has decreased by ~50%.
 - Elective surgical experience has been minimally affected, so operative logs show little change.
 - Night/weekend duty is associated with more individual responsibility/decision making, remote supervision, and with more urgent/emergent patient problems. Thus conditional autonomy and the exposure to unscheduled urgent problems has been severely compromised.

Other Influences on Resident Independence and Autonomy

- Increasing legal constraints and a changing ethical environment over 3-4 decades have made it unacceptable for residents to be unsupervised in or out of the OR>>>no more “chief resident” services
- Increased financial pressure on attendings to generate RVU's has led to their presence in the OR for virtually all surgery; OR time pressures may lead attendings to take cases from residents.
- One day after completing residency a surgeon is “board eligible” and legally entitled to be autonomous.
- Conclude: Autonomy and independence for residents is only possible in post-residency fellowships.

Summary of Current Issues with General Surgical Residency

- Inadequate surgical exposure/experience in medical school
- Highly variable training outcomes at different institutions and significant dependence of training outcomes on program size
- Reduced breadth and complexity of resident operative experience due to changes in disease management, technological change, and competition with fellows
- Impact of 80 hour work week-loss of 6-12 months of clinical time, with disproportionate loss of urgent/emergent experience
- Reduced opportunity for autonomy and independent decision making at senior levels of residency

Potential Solutions (1)

- Develop focused training for surgical interns at entry
 - Develop “bootcamps” in last 8 wks of senior yr MS after match for teaching of procedural skills and ward care. ACS has developed excellent curriculum for this and initial experience highly positive. Much greater buy-in from deans needed.
 - Have similar “bootcamps” in first weeks/months of internship for teaching of basic skills if not done earlier; provide “privileging” of house staff in specific skills before unsupervised performance

Potential Solutions (2)

- Improve efficiency/effectiveness of resident training
 - Large amount of wasted and non-educational time but little has been done to improve efficiency. Development of resident skills is extraordinarily slow compared to potential.
 - Define the expected curriculum and provide residents with ability for online self-study and low stakes self-assessment with peer comparisons. Provide defined expectations of achievement and competencies by PGY year.
 - Adopt structured instruction and objective assessment for basic procedural skills; define specific “privileges”
 - Increase mandated junior resident operative experience; have defined skills lab requirements prior to laparoscopic cases to accelerate learning
 - Use standardized assessment tools for intraoperative performance, with explicit feedback re: needed improvements.

Potential Solutions (3)

- Increase the volume and complexity of senior resident operative experience
 - The transition from open to laparoscopic abdominal surgery has removed 50-70% of open operative experience from GS residency but it has not been replaced by equivalent laparoscopic surgery. Much of this experience needs to be brought back into residency, but it can only be done if it becomes a priority for chairs and faculty.

Potential Solutions (4)

- Increase the length of resident training, either by extending the residency to 6 years or incorporating post-residency fellowships as an integral part of training. This is the model for all the royal colleges.
 - A combined program of residency and fellowship offers significant advantages, with GS Board eligibility still achieved at 5 years. Conditional independence, limited autonomy, and ability to bill to generate salary support would all be present in fellowship but not residency.
 - 80% + of residents are already completing post-residency fellowships, so the impact of adding the other 20% would not be great.

Potential Solutions (5)

When crafting solutions we also need to focus on how adequately our training paradigm is meeting the most urgent public need:

- The largest current public need is for “general” general surgeons for urgent/emergent care, and coverage of smaller/rural hospitals. There are GS shortages throughout the country, and specialty surgeons increasingly opt out of ED call schedules. This can be solved only by a marked expansion of acute care surgery fellowships or the development of alternative GS fellowships targeted to this need.
- (Current ACS development of the Transitions to Practice Fellowships is very close to this.)

Summary

- The impacts on surgical training from changes in disease management, technological advancement, and fellowship expansion have been enormous in the last 20 years, but have not been addressed by changes in training.
- The impact of the 80 hour work week on total in-hospital clinical experience, urgent/emergent care experience, and resident independence and autonomy have been minimally discussed and no remedies have been proposed.
- Longer term changes in multiple ethical, legal, and financial factors have reduced resident autonomy and conditional independence, and left them less prepared for independent practice.

Summary

- None of the above factors are reversible; nearly all have been beneficial for patients.
- Solutions must therefore be sought in new and innovative ways.
- Redesign of the surgical training paradigm is needed, as fellowship training is now the norm for 80% of residents; fellowship training needs to be considered an integral part of full surgical training (similar to all Royal Colleges).
- The majority of post-residency fellowship training occurs in fellowships that have no uniform accreditation standards and no verification of training quality. This needs to change.

Specific Objectives

- Improve the efficiency of resident training and hold residents more accountable for their own learning
 - Pre-residency “bootcamps”
 - Defined and structured curriculum; online delivery of content
 - Personal responsibility of residents for education
 - Provision of tools for self-assessment, peer comparison
 - More targeted teaching/validation of procedural skills
 - Reduction of wasted non-educational time
- Increase the operative experience of junior residents in common surgical cases, and provide more structured experience and verification of competence
- Increase the complexity of senior resident experience
 - The losses in volume and complexity of open surgery need to be replaced by comparable experience in laparoscopic surgery

Specific Objectives

- Consider fundamental redesign of residency training, to incorporate earlier specialty tracking within residency, and fellowship training for all following 5 years of residency.
- Develop an accreditation system for post-residency training which provides uniform standards for all fellowships, irrespective of specialty, rather than the present non-system.