



# Optimizing the Operating Room without Compromising Resident Education

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1

1

## OR Requirement

- Cases completed
  - Successfully
  - Efficiently
    - Time
    - Cost
  - Satisfied patient

2



2

# Residency Requirement

- Development of competent surgeons
- ACGME Program Requirement
  - Final evaluation
  - Program Director must verify
    - Dr. <graduating chief resident> has demonstrated the knowledge, skills, and behaviors necessary to enter autonomous practice

3



3

# Danger

- General surgery → concerns regarding graduating chief competency
  - Due to:
    - Duty-hour restrictions
    - Decreased autonomy
    - Increasing operative complexity
    - More subspecialty fellows/attendings
    - Higher external regulatory pressure

4



4

# Danger



The New York Times

DOCTOR AND PATIENT

Are Today's New Surgeons Unprepared?

BY PAULINE W. CHEN, M.D. | DECEMBER 12, 2013 12:30 PM



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5

5

# Danger

## General Surgery Residency Inadequately Prepares Trainees for Fellowship

- Mattar et al. *Annals of Surgery* 258(3):p 440-449, September 2013.
- Survey of fellowship program directors:
  - 21% felt that new fellows arrived unprepared for OR
  - 30% could not independently perform a lap chole
  - 66% unable to operate for 30 unsupervised minutes of a major procedure

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6

6

# Danger

## Confidence Crisis Among Gen Surg Residents

- Elfenbein, *JAMA Surg.* 2016 Dec 1;151(12):1166-1175.
- Systematic review 15 studies GS grad confidence
  - 2/3 negative re competence to practice or enter fellowship
  - Confidence crisis is a potentially dangerous narrative based on low-quality evidence
    - » Could affect how we as a community of professionals are perceived by the public, particularly when the articles are discussed in the lay press and internet blogs

7

7

# Danger

## Confidence Crisis Among Gen Surg Residents

- ‘Confidence’ is a general and colloquial term
- Suggested self-efficacy as a better measure
  - » Judgement of how well one can execute a course of action to deal with a prospective situation
  - » Ability to do the procedure without attending assistance

8

8

# Danger

## Defining the Deficit in US Surgical Training: The Trainee's Perspective

- Anderson et al *JACS* 232(4):p 623-627, April 2021.
- 10 representative (most common) GS operations selected
- Asked about experience doing cases start-finish & teaching
- PGY-5 residents surveyed via ABSITE -> 84% response rate
- Only 8% S-E for all, 20-90% S-E for each individual procedure

9

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Table 2

Reported Self-Efficacy in All Procedures

Procedure	Self-efficacy, %	Independently performed from start to finish, %	Taught from start to finish, %
Wide local excision	90.24	89.17	77.09
Laparoscopic appendectomy	89.82	96.54	95.74
Diagnostic laparoscopy	86.77	88.06	65.88
Laparoscopic cholecystectomy	84.12	94.86	91.31
Breast excisional biopsy	76.98	69.28	40.09
Open inguinal hernia repair	67.14	76.27	70.59
Trauma laparotomy	60.67	50.17	39.22
Trauma thoracotomy	30.00	28.04	14.71
Laparoscopic right hemicolectomy	26.54	26.97	9.76
Open thyroidectomy	19.58	13.37	7.06

JOURNAL OF THE AMERICAN COLLEGE OF SURGEONS

### Conclusions:

- Considerable deficit in preparation for practice exists for PGY5 residents
- Concerning that this deficit exists in 10 of the most common procedures in residency and in practice

### Defining the Deficit in US Surgical Training: The Trainee's Perspective

Anderson, Tiffany N.; Payne, Davis H.; Dent, Daniel L.; Kears, LaDonna E.; Schmiederer, Ingrid S.; Korndorffer, James R.  
*Journal of the American College of Surgeons* 232(4):623-627, April 2021.  
 doi: 10.1016/j.jamcollsurg.2020.11.029

Wolters Kluwer

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10

# Danger

- Urology?

11

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# Danger

## Evaluation of Urology Residency Training and Perceived Resident Abilities in the United States

- Okhunov et al (UCI), *J Surg Educ.* 2019 Jul-Aug;76(4):936-948.
  - Survey of chief residents/recent graduates and program directors US urology programs re multiple issues
    - » Most comfortable performing essential procedures
    - » Lack of confidence in performing unsupervised advanced minimally invasive procedures
    - » 2/3 -> fellowship to overcome perceived training deficiencies

12

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# Danger

## Current status of urology surgical training in Europe

- Carrion et al, *World J Urol.* 2020 Jan;38(1):239-246.
  - Survey of 2017 European Urology Residents Education Programme (Chief residents course)
    - » 14% thought performed enough surgeries during training
    - » 83% would like to continue training with a fellowship
    - » Confidence performing major/minimally invasive procedures and overall satisfaction with training is low

13

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# Goal

- Urology must continue to produce highly competent surgeons across the spectrum
  - Perform
  - Teach

14

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# Optimizing the OR

- Successful
- Safe
- Efficient
  - Cost & Time
- Atmosphere of low anxiety
  - Avoid burnout

15



15

# Optimizing the OR

Optimizing the OR

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Optimizing Resident Education in the OR

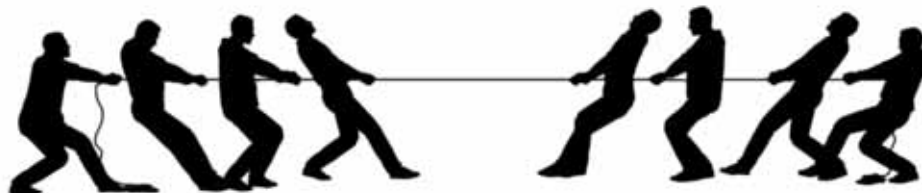
16



16

# Optimizing the OR

- Residents in the OR



**PROS**

**vs.**

**CONS**

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17

17

# Residents

- Cons
  - Longer cases
  - Equipment
    - Unnecessary use or breakage
  - Operative misadventures
    - Resident as primary surgeon safe with similar outcomes
      - Oliver et al *JAMA Surg* 2022 Mar 1;157(3):211-219.
      - VASQIP database study at the VA

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18

18

# Residents

- Pros
  - Support other demands saving time
    - Urgent pages, consults, pre- & post-op paperwork
  - Surgery
    - Assist critical portions
      - » No second attending needed
    - Performance of non-critical portions
      - » Attending can attend to other demands
      - » May allow overlapping/concurrent surgeries

19



19

# Residents

- Pros
    - Add energy & curiosity
    - Mentoring opportunity for faculty
- Make academic faculty jobs desirable!

20



20

# Longer Cases

## The "Cost" of Operative Training for Surgical Residents

- Babineau et al, *Arch Surg.* 2004;139(4):366-370.
- Studied 4 proc at time of adding PGY-3 resident rotation to community hospital with same attendings
  - Significant increase in time
  - Minimal cost to hospital
  - Opportunity cost to attendings

21

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# Longer Cases

## The "Cost" of Operative Training for Surgical Residents

Operating Room Time With and Without a Resident

Procedure	Time in the Operating Room, min*		Change in Time, min	P Value	%Time Incr
	Without a Resident	With a Resident			
Hernia repair	38.0 ± 1.7 (n = 18)	46.0 ± 3.1 (n = 14)	8	.03	21
Laparoscopic cholecystectomy	63.0 ± 3.5 (n = 32)	86.0 ± 5.8 (n = 26)	23	.002	37
Carotid endarterectomy	124.0 ± 2.1 (n = 42)	168.0 ± 7.9 (n = 17)	44	<.001	35
Partial colectomy	115.0 ± 7.9 (n = 25)	175.0 ± 28.6 (n = 9)	60	.08	52

\*Data are given as mean ± SE.

22

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# Longer Cases

- Similar findings in other specialties
  - Ortho
    - ACL repair 94 vs 128 min (Iowa Orthop J. 2001;21:31-5.)
  - Gen surg (J Surg Educ. 2016 Nov-Dec;73(6):979-985.)
    - 30k cases at Lvl 1 trauma center, single CPT with or without resident involvement
    - ~5 min more = ~\$500,000 more/yr

23



23

# Longer Cases

## Urology – multiple studies confirm

- Ruhotina et al *Can Urol Assoc J.* 2014 Sep;8(9-10):334-40.
  - ~8000 min invasive prostatectomies, radical nephrectomies & partial nephrectomies
  - Resident involved cases more likely to have prolonged operative time
  - No difference in complication, reoperation or readmission rates, as well as length-of-stay

24



24

## Longer Cases

- Jackson & Peterson, *Front Surg.* 2022 Oct 20;9:997324.
  - Junior residents took significantly longer specifically with hilar dissection
- Tsivian et al, *Urology.* 2022 Jul;165:128-133.
  - For open radical cystectomy
    - » operative times were 30-40 minutes longer in procedures assisted by junior vs. senior
    - » trainee level not associated with overall/severe complications or oncologic outcomes

25



25

## Residents

- Solutions
  - Efficient
    - Time
    - Cost/Equipment
  - Work environment conducive to learning

26



26

## Resident Efficiency

- Maximize efficiency → maximize experience
  - Time in OR
  - Participation
  
  - Opportunity to teach

27



27

## Resident Experience Solutions

- Exposure
  - Get to OR!
    - No
      - Routine discharges, dressing changes, staple removal, paperwork, consults, rounds, etc.
    - Yes
      - Urgent/emergent patient care
        - » APPs for some of this?
      - Clinic

28



28

# Resident Experience Solutions

- Maximize case participation
  - Resident knowledge
    - Disease, Patient, Case, Equipment
    - Explosion of cases/approaches
  - Faculty knowledge
    - Resident strengths & weaknesses
  - Planning
  - Feedback

29



29

# Maximize Case Participation

- Resident knowledge
  - Patient
    - Clear assignments the day before
      - Juniors should also prepare as if they are doing the case
    - Preop conference
      - Imaging review
      - Special considerations
        - » Comorbidity
        - » Anatomy

30



30

# Maximize Case Participation

- surface of the bladder neck. With small glands you can take the prostate out without removing the foley; with larger glands, once you have made a small anterior cystomy the foley will be removed and you can look for a median lobe and the uos.  
- Once the gland is out the boss will inspect it and tell you whether or not you have ruined the man's erections

case?

## Reconstructing the bladder neck

- Start with attaching an alicc clamp equidistant between the the two uo's at the posterior bladder neck. The boss will put the alicc clamp on – you take a pickup and hold open bladder as the boss makes sure

- Institutional knowledge
  - 'Cheat sheet' passed from resident-resident

31



31

# Maximize Case Participation

- Resident knowledge
  - Equipment
    - Simulators & Trainers
      - Robotic, Laparoscopic, Endoscopic, Percutaneous, Open
    - Didactics?
      - Laparoscopy, others?
    - Cost
      - Continuous background education

32



32

# Maximize Case Participation

- Faculty knowledge of resident skills
  - Longer rotations
    - More direct faculty-resident interaction
      - Preceptorship model?
  - Formal communication/hand-off re skills both good & needing work
    - Access to prior operative evaluations
    - SIMPL, myTIPreport

33



33

# Maximize Case Participation

- Planning
  - Preflight with attending & residents
    - Supplement faculty knowledge
    - Determine resident priorities
    - Set timeframe and scope of resident work
      - Avoid long struggle at one portion and loss of ability to do straightforward portion of another section of operation
- Debrief/feedback

34



34

## Opportunity to Teach

- Resident opportunity to teach
  - Part of graduated responsibility
  - Best way to learn a case is to teach it
    - Also inspires junior residents
  - Will take longer
    - Time efficiency & preflight planning important
    - Set expectations for faculty call/takeover

35

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35

## Implementation

- Resident development
  - Be clear about goal to improve their operative performance & efficiency together
  - Help them prioritize/take command of their education
    - Here's why you need to get to the OR...
    - Here's what you need to do to be prepared...
    - Here's what can wait...

36

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# Implementation

- Faculty Development
  - Consistent expectations
  - Pass on knowledge of residents
    - Formally with access to operative assessment tool
  - Share best practices for allowing residents graded autonomy

37



37

# Efficiency

- Other thoughts
  - PA's or other OR assistants
    - Loss of resident experience?
    - Preferred to residents after trained?
  - Preop Anesthesia/CPC clinics
  - Alternate equipment strategies
    - Disposable scopes for high demand case done by residents

38



38

## Take Home Messages

- Must develop competent urologic surgeons
  - Safe & efficient environment

39



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39

## Take Home Messages

- Residents
  - Get to OR
  - Be prepared
    - Patient, case, equipment
    - ?AUA Case Curriculum
  - Set expectations
    - Participate as planned
  - Debrief

40



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# Take Home Messages

- Requires
  - Resident & faculty development & collaboration

41

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# Thank you

- Questions?



42

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