Content of a Feed-Forward Letter from Medical Schools to Surgery Residency Programs

BY

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THESIS

Submitted as partial fulfillment of the requirements
for the degree of Master of Health Professions Education
in the Graduate College of the
University of Illinois at Chicago, 2019

Chicago, Illinois

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ACKNOWLEDGMENTS

I would like to thank my thesis committee, Dr. Ara Tekian, Dr. Yoon Soo Park and Dr. Klara Papp for their guidance and insight throughout this project.

I would also like to express my gratitude to the members of the expert panel without whose significant effort this project would not have been possible. The following panelists elected to be named, while the others preferred to remain anonymous.
Karen Brasel, MD, MPH, Oregon Health & Science University; Brittany Hasty, MD, MHPE, Loyola University; Michael Brunt, MD, Washington University; Charles Paget, MD, Carilion Clinic; Christine Peterson, MD, University of Virginia; Col. E. Matthew Ritter, MD, Uniformed Services University of the Health Sciences; Giselle Hamad, MD, University of Pittsburgh; Jason Lees, MD, University of Oklahoma; Jon Morris, MD, University of Pennsylvania; Kimberly Brown, MD, University of Texas Medical Branch; Lisa Schlitzkus, MD, University of Nebraska; Paul Gauger, MD, University of Michigan; Rebecca Williams-Karnesky, MD, PhD, University of New Mexico; Samantha Ahle, MD, Yale University; Sara Mcintire, MD, University of Pittsburgh and Deborah Marquardt, University of Washington

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS

AAMC	Association of American Medical Colleges
ACGME	Accreditation Council on Graduate Medical Education
EPAs	Entrustable Professional Activities
LEH	Learner Educational Handover Protocol
MSPE	Medical Student Performance Evaluation
NRMP	National Resident Matching Program

SUMMARY

The content of an educational handover letter was determined through the quantitative and qualitative analysis of expert opinion. Twenty-two unique items were identified for inclusion. Qualitative analysis identified four themes to guide the further development and implementation of the process. A template for an educational handover letter is provided based on the consensus of experts.

I. Background

At present, the only information on medical student performance provided by medical schools to residency programs is the medical student performance evaluation (MSPE, formerly "Dean's Letter"). This evaluation has been criticized for its strong bias in favor of students, except in the few areas where truly objective data is reported, such as class standing. Even course grades can be unreliable due to grade inflation. (Alexander et al. 2012; Boysen Osborn et al. 2016) Despite efforts by the Association of American Medical Colleges (AAMC) to standardize the MSPE, the actual product received by residency programs is highly variable with less than ½ of US and Canadian schools complying with the AAMC's recommendations. (Boysen-Osborn et al. 2017; AAMC 2017) Across US and Canadian medical schools, as many as 72 different terms are used to describe the top tier of students. (Hom et al. 2016)

The other information residency programs receive includes USMLE scores, letters of recommendation, personal statements and CVs. None of this information provides additional data on the specific strengths and areas in need of improvement for entering residents. Therefore, residency programs must identify the areas of strength and challenge in each trainee and then try to appropriately accommodate. For some programs this task may be insurmountable, leaving trainees to progress through residency without having these areas addressed. Certainly processes exist by which residency programs identify significant deficits and strengths in their trainees. However, these can be unreliable and require significant frequency and time exposure to be effective.

The idea of communication between medical schools and residency programs to fill this information gap has been raised. ("Millennium Conference on Transforming the Post-Clerkship Curriculum" 2015) The intention of a so called "educational handover" letter would be to provide a more detailed, unbiased, focused assessment of a student's abilities ahead of their entry to residency. This letter would be sent from medical schools to residency programs after the National Resident Matching Program (NRMP) Match has occurred. The goal is helping residency programs provide an appropriate experience for trainees that capitalizes on their strengths and targets their areas in need of additional development. This information would benefit the residency programs and trainees by allowing the early experience in residency to align with trainee abilities rather than relying on time and exposure to elucidate them.

The creation of a standardized educational handover letter will require three separate steps to assure it is optimized. First, the content must be agreed upon by stakeholders; residency program directors who will utilize the letter, medical school faculty who will create the letter and trainees whose experience will be impacted by the letter. The second step will be creating a process for collection of the

identified content. Finally, the impact of the letter on the trainee, residency program and medical school must be assessed.

The present study addresses the first step by identifying the content of an educational handover letter for trainees pursuing residency in General Surgery. This is attained through the quantitative and qualitative analysis of input from expert stakeholders. A template is also suggested for the organization of its content.

II. Methods

A Delphi method of attaining consensus was employed to determine the key elements for inclusion in the letter. (Dalkey 1968) This method was selected to allow participation of the major stakeholder groups while mitigating the inherent power differential between these cohorts. Experts were program directors in general surgery, medical student surgical acting internship or prep course ("boot camp") directors, authors of MSPEs and current categorical general surgery residents.

The consensus process was designed adhering to previously published recommendations. (Humphrey-Murto et al. 2017; Nair, Aggarwal, and Khanna 2011; Waggoner, Carline, and Durning 2016) Specifically these measures included: a priori definition of consensus, provision of relevant literature to participants before the first round, clear criteria for the definition of expert participants, provision of data with results for each round, opportunity for participants to reword or add topics at each round, inclusion of 12 or fewer participants per group and lack of forced consensus. (Skulmoski, Hartman, and Krahn 2007)

The a priori definition of consensus was set as an average rating of ≤ 2 (should be included) on an anchored Likert scale of 1-5 (1: must be included, 2: should be included, 3: could be included or excluded, 4: should be excluded, 5: must be excluded). Additionally, consensus was considered achieved only if 80% of participants state agreement with the final list of items. These measures have previously been described as an appropriate definition of consensus. (Nair, Aggarwal, and Khanna 2011) This definition was selected as it permits a quantitative assessment of the differences between and within groups.

The ideal number of participants in a Delphi panel is unknown. However, Nair et al found that increasing the number beyond 12 did not significantly increase the reliability of responses. (Nair, Aggarwal, and Khanna 2011) Less than 4 has also been noted to be inadequate. The most important element seems to be drawing a panel with varied expertise and opinion. (Bloor, Sampson, and Baker 2015) Bloor also recommends that additional participants be recruited such that "no-shows" or drop outs do not disrupt the project. Therefore, a total of 32 experts were recruited, with 8 from each of the 4 groups of stakeholders. This number was selected to account for attrition of up to 4 representatives from each cohort while still maintaining the requisite minimum 4 experts per group.

Program directors were selected from the membership of the Association of Program Directors in Surgery. Only those with a strong academic reputation were included, as determined by discussion with leaders in surgical education. Acting internship and prep course directors were identified from the list of participants in the American College of Surgeons / Association of Program Directors in Surgery / Association for Surgical Education Prep Course Curriculum based on the number of years they have

been in this role. MSPE writers were identified by discussion with the writers at Case Western Reserve University, School of Medicine, whose MSPE writers have frequent contact with others nationally. Additionally, MSPE writers were required to have authored this document for medical students pursuing surgical residency. Current General Surgery residents were chosen by identifying resident members of the Association for Surgical Education who are actively involved in the Association through committee service and scholarly work. Diversity of location and gender was sought across all groups. Historically black colleges and universities as well as institutions associated with the military were specifically included to further enhance the breadth of expert experience.

Prior to the first round, potential expert participants were contacted via email to provide an introduction to the study, relevant background literature and attain a commitment to participate. (Wancata et al. 2017) Eight experts in each group agreed to be included. There was no difference in methodology for any of the groups.

The first round of the study asked the experts to provide a list of knowledge, skills, attitudes or existing assessments they believe would be important to include in an educational handover letter from undergraduate to graduate education in General Surgery. Although inclusion of specific elements for participants to select from has been recognized as an acceptable part of the first step in a Delphi study, not enough is known about the potential content of these letters to provide this to participants. (Hsu and Ohio 2007)

Prior to the second round, the items identified by experts in the first round were reviewed by two of the authors for redundancy. The list of unique items was then sent to all participants with instructions to rank the topics relative to their appropriateness for inclusion in an educational handover letter on the anchored Likert scale described above. An area for comment was available for each item individually. Participants also had the opportunity to add supplementary items to the list and to provide general comments.

In the third round, the full list of items was again sent to all participants. With each item, the expert was shown the score they had assigned it in round two, the average score for the item including all participants, as well as all comments that had been entered. The comments were provided unedited. Participants were then asked to rank each item again with this new information. Opportunities for additional comment on each item as well as in general were also provided.

The final list of items meeting consensus criteria were then distributed to the group for review and comment. Participants were asked to agree or disagree that the list represented the items they believe should be included in the letter. They were also offered to remain anonymous, or be named as a

member of the expert panel (see acknowledgments for a list of those who elected to be named). The study was conducted from April to July, 2019.

Quantitative analysis was performed on the numeric scores provided by each expert. Differences in means were calculated using a two-tailed Student's t-test with $p<0.05$ considered significant. Differences between groups were analyzed using ANOVA. Standard error of the mean was reported to adjust for the number of participants responding to each item. SAS JMP version 14.3 was used to perform this analysis.

Qualitative analysis was performed on all provided comments. An inductive approach to coding was used to permit the themes to ground the study. (Glaser and Strauss 1966) Manifest and latent coding was used to optimize reliability of the thematic analysis. Nvivo 12 plus (Burlington, Massachusetts) was used to facilitate coding. Qualtrics (Provo, Utah) was used to electronically distribute the surveys.

IRB approval was obtained from Cleveland Clinic and the University of Illinois, Chicago.

III. Results

Participants represented 29 institutions from all geographical regions of the United States. MSPE writer specialties were Cardiology, General Internal Medicine (2), General Surgery, Infectious Disease, Nephrology, OB/GYN and Pediatrics. Demographics are provided in Table I.

TABLE I: DEMOGRAPHICS OF PARTICIPANTS

	Course Directors	MSPE Writers	Program Directors	Residents
	Mean (range)			
Years since graduating medical school	24.5 (13-39)	33 (24-43)	23 (15-29)	4.9 (4-6)
Years in current role at current institution	13 (2-29)	22 (2-31)	7.6 (5-13)	3.8 (1-6)
Female	62.5%	50.0%	37.5%	62.5%

In the first round, 29/32 (90.6%) experts participated. This included all 8 residents, all 8 medical student course directors, 7/8 program directors and 6/8 MSPE letter writers. The one missing program director's response was unable to be recorded due to technical problems. The two MSPE writer non-responders did not reply to reminder emails.

A total of 285 individual items were identified by the 29 participants. These were reviewed by two of the authors and identified that all but 54 of these were redundant with 95% agreement between the authors. After the conclusion of the first round, one MSPE writer elected to stop participating due to time constraints.

Participation in the second round included 30/31 experts (96.8%). The same one program director's responses were again unable to be retrieved due to technical issues. The average score for items in this round was 2.3 ± 0.5 (range 1.2 – 3.4). Of the 54 unique items, 30 (55.6%) scored ≤ 2 (should be included) meeting the planned definition for consensus. Scores were mostly similar between groups of experts (Table II). Statistically significant differences were found for five items. For "academic performance on clinical rotations" residents found this significantly less important (mean score 2.75) than MSPE writers (mean score 1.29, p=0.01) or MS4 directors (mean score 1.5, p=0.03). Regarding "assessment of technical skills" MS4 directors found this more important (mean score 1.63) than MSPE writers (mean score 3, p=0.005) or residents (mean score 2.5, p=0.047). "Oral presentation skills" were felt more important to MS4 directors (1.5) than to Program Directors (mean score 2.43, p=0.03) or residents (mean score 2.75, p=0.01). Organizational skills were also more important to MS4 directors (mean score 1.5) than to residents (mean score 2.63, p=0.01). USMLE scores were more

important to Program Directors (mean score 1.86) than to MSPE writer (mean score 3.57, p=0.03) or residents (mean score 3.5, p=0.01).

In the third round, 27/31 (87.1%) experts participated. One resident, one program director (a different person from the prior two rounds) and two medical student course directors did not respond to reminder emails. One item, suggested for addition to the list of items in round two, "compassionate approach to patients," was added to this round. The average score for items in this round was 2.5 ± 0.5 (range 1.3 – 3.6). At the conclusion of this round, 23 items (41.8%) met the final criteria for consensus. (Table III) One item that met the criteria for inclusion, "ability to function in a team" was removed due to its significant overlap with AAMC EPA 9: "Collaborate as a Member of an Interprofessional Team." (AAMC 2014) No items that did not meet consensus for inclusion in the second round did meet consensus in the third round and no additional items met consensus. Only two items had significant differences in scoring between groups. "Performance in mock page assessments" was found more important to residents (mean score 2.57) than to MSPE writers (mean score 3.71, p=0.01). The "ability to interpret medical images" was also more important to residents (mean score 2.29) than to any of the other groups (MS4 Directors mean score 3.17, p=0.03, MSPE writers, mean score 3.29, p=0.04, Program Directors, mean score 3.71, p=0.01).

Between the second and third rounds, a change in the average score was seen for 50/54 (92.6%) items, with a mean change of 0.2. All changed items moved towards a lower rating (higher score) on the Likert scale except "Completion of residency prep course (Boot Camp)" which gained importance by 0.2. Only three of these changes were significant. "Ability to function independently" moved from 1.9 to 2.3 (p=0.04), "a list of specific high and low performing personal attributes" from 2.0 to 2.4 (p=0.03), and "global housestaff readiness score (ACS-ERRA)" from 2.9 to 3.4 (p=0.04). (Table IV)

Review of the final consensus items resulted in 30/31 (96.8%) agreeing that the list represents the important elements that should be included in an educational handover letter from medical schools to residencies in General Surgery. Thus, expert consensus was achieved on these 22 items (Table V).

A total of 395 comments were received from 24 participants (5 Program Directors, 5 MSPE writers, 6 MS4 Directors and 8 residents). From these, four themes emerged regarding the utility and implementation of an educational handover letter. These were "minimize redundancy," "optimize impact," "use appropriate assessments," and "mitigate risk." Frequency of themes and representative quotes are shown in Table VI.

TABLE II: MEAN SCORES FOR ROUND 2

Item	Overall Mean Score	MS4 Director	MSPE Writer	Program Director	Resident	p
	Mean ± Standard error of mean					
Extent and context of the letter writer's contact with the individual	1.17 ± 0.08	1.13 ± 0.16	1 ± 0.18	1.14 ± 0.18	1.38 ± 0.16	0.47
Ability to function in a team	1.43 ± 0.13	1.13 ± 0.25	1.29 ± 0.27	1.43 ± 0.27	1.88 ± 0.25	0.20
Ability to communicate with others	1.43 ± 0.14	1 ± 0.25	1.43 ± 0.27	1.29 ± 0.27	2 ± 0.25	0.06
Assessment of professional behavior	1.57 ± 0.16	1.38 ± 0.32	1.57 ± 0.34	1.29 ± 0.34	2 ± 0.32	0.42
Discernment (knowing when to ask for help)	1.7 ± 0.17	1.5 ± 0.53	1.29 ± 0.49	2.14 ± 1.46	1.88 ± 0.83	0.30
Response to feedback	1.7 ± 0.19	1.38 ± 0.74	1.71 ± 1.11	1.43 ± 0.79	2.25 ± 1.28	0.31
Insight into own performance	1.76 ± 0.15	1.38 ± 0.27	2.14 ± 0.29	1.5 ± 0.31	2 ± 0.27	0.17
Academic performance on clinical rotations	1.83 ± 0.18	**1.5 ± 0.3***	**1.29 ± 0.32***	1.71 ± 0.32	**2.75 ± 0.3***	**0.01**
Recommendations for remediation if needed upon starting residency	1.83 ± 0.21	2.25 ± 0.41	1.71 ± 0.44	1.43 ± 0.44	1.88 ± 0.41	0.59
Demonstration of adaptable and growth oriented behavior	1.87 ± 0.18	1.5 ± 0.35	2 ± 0.37	1.71 ± 0.37	2.25 ± 0.35	0.46
Work ethic	1.87 ± 0.19	1.63 ± 0.37	1.86 ± 0.39	1.57 ± 0.39	2.38 ± 0.37	0.43
Ability to function independently	1.9 ± 0.17	1.75 ± 0.33	1.86 ± 0.35	1.67 ± 0.38	2.25 ± 0.33	0.63
Self-management and internal motivation	1.9 ± 0.19	1.75 ± 0.38	2 ± 0.4	1.71 ± 0.4	2.13 ± 0.38	0.85
Organizational skills	2 ± 0.15	**1.5 ± 0.27***	1.86 ± 0.28	2 ± 0.28	**2.63 ± 0.27***	**0.04**
A list of specific high and low performing personal attributes	2.03 ± 0.18	1.63 ± 0.35	2.43 ± 0.37	1.71 ± 0.37	2.38 ± 0.35	0.26
Level of entrustability for all 13 EPAs with assessment method	2.03 ± 0.19	2.25 ± 0.35	1.57 ± 0.37	2.57 ± 0.37	1.71 ± 0.37	0.22
Problem-solving ability	2.07 ± 0.16	1.63 ± 0.3	2.29 ± 0.32	1.86 ± 0.32	2.5 ± 0.3	0.18
Assessment of patient evaluation and decision making	2.07 ± 0.2	2 ± 0.41	2.14 ± 0.44	2 ± 0.44	2.13 ± 0.41	0.99
Oral presentations skills	2.13 ± 0.18	**1.5 ± 0.31***	1.86 ± 0.33	**2.43 ± 0.33***	**2.75 ± 0.31***	**0.04**
Ability to create therapeutic relationships with patients	2.14 ± 0.15	1.88 ± 0.3	2 ± 0.35	2.29 ± 0.32	2.38 ± 0.3	0.63
Ability to find information and fill knowledge gaps	2.14 ± 0.18	2.13 ± 0.34	1.67 ± 0.4	2.29 ± 0.37	2.38 ± 0.34	0.57
Unique characteristics	2.17 ± 0.17	2.13 ± 0.31	2 ± 0.33	1.71 ± 0.33	2.75 ± 0.31	0.15
Leadership and Followership	2.2 ± 0.15	2 ± 0.27	2.57 ± 0.29	1.71 ± 0.29	2.5 ± 0.27	0.13
Completion of residency prep course (Boot Camp)	2.2 ± 0.17	2 ± 0.32	2.29 ± 0.35	2.71 ± 0.35	1.88 ± 0.32	0.32
Special certifications (BLS, ACLS, Stop the Bleed, etc.)	2.27 ± 0.19	2.38 ± 0.38	2.57 ± 0.41	2.29 ± 0.41	1.88 ± 0.38	0.64
Narrative comments that were not included in residency application	2.27 ± 0.21	2.5 ± 0.41	2.57 ± 0.44	1.86 ± 0.44	2.13 ± 0.41	0.63
List of clinical rotations completed during medical school	2.27 ± 0.22	2.75 ± 0.43	2.14 ± 0.46	2.57 ± 0.46	1.63 ± 0.43	0.28

TABLE II: MEAN SCORES FOR ROUND 2 (CONTINUED)

Item	Overall Mean Score	MS4 Director	MSPE Writer	Program Director	Resident	P
	Mean ± Standard error of mean					
Level of preparedness (eg for cases)	2.3 ± 0.16	2 ± 0.76	2.29 ± 1.11	2.14 ± 0.69	2.75 ± 0.89	0.37
Assessment of technical skills	2.33 ± 0.18	**1.63 ± 0.3***	**3 ± 0.33***	2.29 ± 0.33	**2.5 ± 0.3***	**0.04**
Ability to discern "sick" from "not sick"	2.45 ± 0.19	2.38 ± 0.35	1.86 ± 0.37	3 ± 0.41	2.63 ± 0.35	0.23
Ability to use literature to inform and defend clinical decision-making	2.47 ± 0.18	2.5 ± 0.36	2.29 ± 0.38	2.71 ± 0.38	2.38 ± 0.36	0.87
Evidence of accomplishments outside of medical school	2.47 ± 0.19	2.25 ± 0.36	2.57 ± 0.39	2 ± 0.39	3 ± 0.36	0.28
A list of specific high and low performing areas of medical knowledge	2.53 ± 0.15	2.38 ± 0.29	2.86 ± 0.31	2.14 ± 0.31	2.75 ± 0.29	0.33
Training received about handoffs - model used, demonstrated proficiency	2.57 ± 0.19	2.5 ± 0.38	2.29 ± 0.4	3 ± 0.4	2.5 ± 0.38	0.64
Meaningful comparison to peers	2.57 ± 0.22	2.25 ± 0.41	3.14 ± 0.44	2 ± 0.44	2.88 ± 0.41	0.24
Training received about inter- and intra-personal skills	2.59 ± 0.18	2.71 ± 0.38	2.43 ± 0.38	3 ± 0.38	2.25 ± 0.35	0.50
Ability to navigate an electronic health record	2.59 ± 0.19	2.5 ± 0.37	2.29 ± 0.4	2.71 ± 0.4	2.86 ± 0.4	0.75
Teaching ability	2.6 ± 0.16	2.5 ± 0.33	2.71 ± 0.36	2.57 ± 0.36	2.63 ± 0.33	0.98
Suturing and knot tying ability	2.63 ± 0.14	2.38 ± 0.26	3.14 ± 0.28	2.43 ± 0.28	2.63 ± 0.26	0.21
Assessment of ACGME General Surgery Milestones	2.67 ± 0.19	2.75 ± 0.36	2.71 ± 0.38	3.14 ± 0.38	2.13 ± 0.36	0.29
OSATS for ACS/APDS Phase I curriculum skills	2.7 ± 0.15	2.63 ± 0.31	2.86 ± 0.33	2.86 ± 0.33	2.5 ± 0.31	0.81
Estimated ability to eventually function as a surgeon	2.73 ± 0.23	2.38 ± 0.44	3.43 ± 0.47	2.29 ± 0.47	2.88 ± 0.44	0.30
Results of knowledge-based assessments	2.79 ± 0.21	2.71 ± 0.76	3 ± 1.29	2.14 ± 1.35	3.25 ± 1.04	0.30
Documented training in quality and practice improvement methods	2.83 ± 0.17	2.88 ± 0.33	2.43 ± 0.35	3 ± 0.35	3 ± 0.33	0.62
Realistic understanding of life of surgeon	2.83 ± 0.19	2.88 ± 0.37	3 ± 0.4	2.43 ± 0.4	3 ± 0.37	0.70
Global housestaff readiness score (ACS-ERRA)	2.9 ± 0.2	2.88 ± 0.40	2.58 ± 0.43	3.29 ± 0.43	2.88 ± 0.40	0.70
Ability to interpret medical images	2.93 ± 0.17	2.88 ± 0.33	3 ± 0.35	3.29 ± 0.35	2.63 ± 0.33	0.58
Self-assessments/evaluations	2.93 ± 0.17	3 ± 0.33	2.71 ± 0.35	2.71 ± 0.35	3.25 ± 0.33	0.63
Performance in mock page assessment	2.93 ± 0.19	2.75 ± 0.38	3.43 ± 0.4	2.86 ± 0.4	2.75 ± 0.38	0.58
Ability to engage in independent research	2.97 ± 0.14	3 ± 0.27	3 ± 0.29	3 ± 0.29	2.86 ± 0.29	0.98
Ability to obtain informed consent	2.97 ± 0.16	3.25 ± 0.31	2.71 ± 0.33	3.29 ± 0.33	2.63 ± 0.31	0.34
USMLE scores	2.97 ± 0.22	2.88 ± 0.38	**3.57 ± 0.4***	**1.86 ± 0.4***	**3.5 ± 0.38***	**0.02**
Grit Scale scores	3.07 ± 0.12	3 ± 0.26	3 ± 0.26	3.29 ± 0.26	3 ± 0.24	0.81
List of surgical disease processes in patients seen	3.4 ± 0.14	3.38 ± 0.28	3.43 ± 0.3	3.71 ± 0.3	3.13 ± 0.28	0.55

* indicates statistically significantly different from each other

TABLE III: MEAN SCORES FOR ROUND 3

Item	Overall Mean Score	MS4 Director	MSPE Writer	Program Director	Resident	p
	Mean ± Standard error of mean					
Extent and context of the letter writer's contact with the individual	1.26 ± 0.11	1 ± 0.25	1.43 ± 0.23	1.14 ± 0.23	1.43 ± 0.23	0.49
Ability to communicate with others	1.52 ± 0.14	1.33 ± 0.52	1.43 ± 0.79	1.43 ± 0.53	1.86 ± 1.07	0.60
Ability to function in a team	1.56 ± 0.15	1.33 ± 0.34	1.57 ± 0.31	1.43 ± 0.31	1.86 ± 0.31	0.68
Assessment of professional behavior	1.67 ± 0.17	1.83 ± 0.36	1.43 ± 0.34	1.43 ± 0.34	2 ± 0.34	0.55
Discernment (knowing when to ask for help)	1.89 ± 0.14	1.83 ± 0.29	1.57 ± 0.27	2.43 ± 0.27	1.71 ± 0.27	0.15
Insight into own performance	1.92 ± 0.1	2 ± 0.2	2.17 ± 0.2	1.71 ± 0.19	1.83 ± 0.2	0.40
Completion of residency prep course (Boot Camp)	1.96 ± 0.15	1.83 ± 0.35	2.14 ± 0.32	1.86 ± 0.32	2 ± 0.32	0.90
Self-management and internal motivation	2.04 ± 0.13	1.67 ± 0.28	2 ± 0.26	2 ± 0.26	2.43 ± 0.26	0.29
Demonstration of adaptable and growth oriented behavior	2.04 ± 0.14	1.67 ± 0.32	2.14 ± 0.29	2.14 ± 0.29	2.14 ± 0.29	0.63
Recommendations for remediation if needed upon starting residency	2.04 ± 0.23	2.67 ± 0.5	1.71 ± 0.47	1.71 ± 0.47	2.14 ± 0.47	0.48
Organizational skills	2.07 ± 0.14	1.5 ± 0.3	2 ± 0.27	2.14 ± 0.27	2.57 ± 0.27	0.09
Work ethic	2.19 ± 0.17	1.83 ± 0.36	2 ± 0.33	2 ± 0.33	2.86 ± 0.33	0.16
Response to feedback	2.26 ± 0.14	2 ± 0.37	2.14 ± 0.34	2.14 ± 0.34	2.71 ± 0.34	0.50
Level of entrustability for all 13 EPAs with assessment method	2.3 ± 0.19	2.5 ± 0.43	2 ± 0.4	2.86 ± 0.4	1.86 ± 0.4	0.29
Ability to function independently	2.31 ± 0.1	2.17 ± 0.23	2.14 ± 0.21	2.43 ± 0.21	2.5 ± 0.23	0.58
Ability to find information and fill knowledge gaps	2.31 ± 0.16	2 ± 0.36	2.43 ± 0.33	2.29 ± 0.33	2.5 ± 0.36	0.76
Unique characteristics	2.33 ± 0.16	2 ± 0.36	2.43 ± 0.33	2.14 ± 0.33	2.71 ± 0.33	0.48
Assessment of technical skills	2.33 ± 0.17	1.83 ± 0.37	2.86 ± 0.34	2.29 ± 0.34	2.29 ± 0.34	0.26
Problem-solving ability	2.37 ± 0.14	2.17 ± 0.34	2.43 ± 0.31	2.29 ± 0.31	2.57 ± 0.31	0.83
Assessment of patient evaluation and decision making	2.37 ± 0.17	2 ± 0.39	2.43 ± 0.36	2.29 ± 0.36	2.71 ± 0.36	0.60
A list of specific high and low performing personal attributes	2.38 ± 0.14	2 ± 0.29	2.5 ± 0.29	2.14 ± 0.27	2.86 ± 0.27	0.16
Oral presentations skills	2.38 ± 0.15	1.83 ± 0.32	2.43 ± 0.3	2.57 ± 0.3	2.67 ± 0.32	0.28
Ability to create therapeutic relationships with patients	2.44 ± 0.16	2 ± 0.37	2.43 ± 0.34	2.57 ± 0.34	2.71 ± 0.34	0.54
Leadership and Followership	2.46 ± 0.14	2 ± 0.32	2.86 ± 0.3	2.43 ± 0.3	2.5 ± 0.3	0.30
Compassionate approach to patients	2.48 ± 0.12	2.5 ± 0.28	2.43 ± 0.26	2.57 ± 0.26	2.43 ± 0.26	0.98
Ability to discern "sick" from "not sick"	2.5 ± 0.16	2.67 ± 0.35	2 ± 0.35	2.86 ± 0.32	2.43 ± 0.32	0.33
Special certifications (BLS, ACLS, Stop the Bleed, etc.)	2.52 ± 0.14	2.83 ± 0.29	2.86 ± 0.27	2.43 ± 0.27	2 ± 0.27	0.11
Ability to use literature to inform and defend clinical decisions	2.59 ± 0.16	2.5 ± 0.36	2.57 ± 0.33	2.86 ± 0.33	2.43 ± 0.33	0.81

TABLE III: MEAN SCORES FOR ROUND 3 (CONTINUED)

Item	Overall Mean Score	MS4 Director	MSPE Writer	Program Director	Resident	p
	Mean ± Standard error of mean					
Suturing and knot tying ability	2.63 ± 0.13	2.5 ± 0.26	3.14 ± 0.24	2.57 ± 0.24	2.29 ± 0.24	0.11
Narrative comments not included in residency application	2.63 ± 0.18	2.5 ± 0.41	3 ± 0.38	2.43 ± 0.38	2.57 ± 0.38	0.71
Academic performance on clinical rotations	2.67 ± 0.14	2.83 ± 0.31	2.14 ± 0.29	2.86 ± 0.29	2.86 ± 0.29	0.25
Meaningful comparison to peers	2.69 ± 0.23	2 ± 0.49	3.43 ± 0.45	2.29 ± 0.45	3 ± 0.49	0.15
Level of preparedness (eg for cases)	2.7 ± 0.13	2.17 ± 0.28	2.86 ± 0.26	2.71 ± 0.26	3 ± 0.26	0.19
A list of specific high and low performing areas of med knowledge	2.7 ± 0.15	2.67 ± 0.35	3 ± 0.32	2.43 ± 0.32	2.71 ± 0.32	0.66
Teaching ability	2.7 ± 0.16	2.67 ± 0.36	3.14 ± 0.33	2.57 ± 0.33	2.43 ± 0.33	0.47
Assessment of ACGME General Surgery Milestones	2.76 ± 0.15	2.83 ± 0.35	3.07 ± 0.33	2.71 ± 0.33	2.43 ± 0.33	0.51
Evidence of accomplishments outside of medical school	2.78 ± 0.17	2.17 ± 0.37	3 ± 0.34	2.71 ± 0.34	3.14 ± 0.34	0.26
Training received about handoffs	2.81 ± 0.17	3.17 ± 0.39	2.86 ± 0.36	2.71 ± 0.36	2.57 ± 0.36	0.72
OSATS for ACS/APDS Phase I curriculum skills	2.85 ± 0.13	3 ± 0.3	3 ± 0.28	2.86 ± 0.28	2.57 ± 0.28	0.68
Ability to navigate an electronic health record	2.88 ± 0.16	2.83 ± 0.37	2.86 ± 0.34	2.67 ± 0.37	3.14 ± 0.34	0.81
Documented training in quality and practice improvement methods	2.93 ± 0.11	2.83 ± 0.26	3.14 ± 0.24	2.86 ± 0.24	2.86 ± 0.24	0.78
List of clinical rotations completed during medical school	2.93 ± 0.18	3.17 ± 0.4	3 ± 0.37	2.57 ± 0.37	3 ± 0.37	0.72
Ability to obtain informed consent	3 ± 0.11	3.17 ± 0.26	3.14 ± 0.24	3 ± 0.24	2.71 ± 0.24	0.54
Self-assessments/evaluations	3 ± 0.11	3 ± 0.27	3.14 ± 0.25	2.86 ± 0.25	3 ± 0.25	0.88
Ability to engage in independent research	3 ± 0.12	2.67 ± 0.26	3.29 ± 0.24	3.29 ± 0.24	2.71 ± 0.24	0.16
Performance in mock page assessment	3 ± 0.16	2.83 ± 0.3	**3.71 ± 0.28***	2.86 ± 0.28	**2.57 ± 0.28***	0.05
Results of knowledge-based assessments	3.04 ± 0.15	3 ± 0.32	3.29 ± 0.3	2.57 ± 0.3	3.29 ± 0.3	0.31
Training received about inter- and intra-personal skills	3.04 ± 0.15	3 ± 0.32	3.29 ± 0.3	3 ± 0.3	2.86 ± 0.3	0.78
Estimated ability to eventually function as a surgeon	3.04 ± 0.17	2.33 ± 0.33	3.43 ± 0.31	3 ± 0.33	3.29 ± 0.31	0.11
Ability to interpret medical images	3.11 ± 0.15	**3.17 ± 0.26***	**3.29 ± 0.24***	**3.71 ± 0.24***	**2.29 ± 0.24***	**0.00**
Realistic understanding of life of surgeon	3.15 ± 0.16	3 ± 0.37	3.29 ± 0.34	3.29 ± 0.34	3 ± 0.34	0.88
Grit Scale scores	3.28 ± 0.11	3.33 ± 0.26	3.29 ± 0.24	3.14 ± 0.24	3.36 ± 0.24	0.92
USMLE scores	3.35 ± 0.16	3.17 ± 0.33	3.57 ± 0.31	2.83 ± 0.33	3.71 ± 0.31	0.24
Global housestaff readiness score (ACS-ERRA)	3.41 ± 0.14	3.33 ± 0.31	3.14 ± 0.29	3.57 ± 0.29	3.57 ± 0.29	0.68
List of surgical disease processes in patients seen	3.57 ± 0.11	3.5 ± 0.25	3.43 ± 0.23	4 ± 0.23	3.36 ± 0.23	0.22

*indicates statistically significantly different from each other

TABLE IV: CHANGE IN AVERAGE SCORES BETWEEN ROUNDS 2 AND 3

Item	Round 3	Round 2	Δ	p
Extent and context of the letter writer's contact with the individual	1.3	1.2	0.1	0.44
Ability to communicate with others	1.5	1.4	0.1	0.73
Ability to function in a team	1.6	1.4	0.1	0.60
Assessment of professional behavior	1.7	1.6	0.1	0.65
Discernment (knowing when to ask for help)	1.9	1.7	0.2	0.25
Insight into own performance	1.9	1.8	0.2	0.56
Completion of residency prep course (Boot Camp)	2.0	2.2	-0.2	0.61
Demonstration of adaptable and growth oriented behavior	2.0	1.9	0.2	0.54
Recommendations for remediation	2.0	1.8	0.2	0.43
Self-management and internal motivation	2.0	1.9	0.1	0.36
Organizational skills	2.1	2.0	0.1	0.86
Work ethic	2.2	1.9	0.3	0.29
Response to feedback	2.3	1.7	0.6	0.05
Level of entrustability for all 13 EPAs	2.3	2.0	0.3	0.37
Ability to find information and fill knowledge gaps	2.3	2.1	0.2	0.64
Ability to function independently	2.3	1.9	0.4	**0.04**
Assessment of technical skills	2.3	2.3	0.0	1.00
Unique characteristics	2.3	2.2	0.2	0.55
Assessment of patient evaluation and decision making	2.4	2.1	0.3	0.44
Problem-solving ability	2.4	2.1	0.3	0.32
A list of specific high and low performing personal attributes	2.4	2.0	0.4	**0.03**
Oral presentation skills	2.4	2.1	0.3	0.51
Ability to create therapeutic relationships with patients	2.4	2.1	0.3	0.37
Leadership and Followership	2.5	2.2	0.3	0.28
Ability to discern "sick" from "not sick"	2.5	2.4	0.1	0.65
Special certifications (BLS, ACLS, Stop the Bleed, etc.)	2.5	2.3	0.3	0.31
Ability to use literature for clinical decision-making	2.6	2.5	0.1	0.66
Narrative comments from evaluations not in application	2.6	2.3	0.4	0.11
Suturing and knot tying ability	2.6	2.6	0.0	1.00
Academic performance on clinical rotations	2.7	1.8	0.8	**0.00**
Meaningful comparison to peers	2.7	2.6	0.1	0.46
A list of specific high and low performing medical knowledge	2.7	2.5	0.2	0.52
Level of preparedness (eg for cases)	2.7	2.3	0.4	0.15
Teaching ability	2.7	2.6	0.1	0.88
Assessment of ACGME General Surgery Milestones	2.8	2.7	0.1	0.83
Evidence of accomplishments outside of medical school	2.8	2.5	0.3	0.29
Training received about handoffs	2.8	2.6	0.2	0.28
OSATS for ACS/APDS Phase I curriculum skills	2.9	2.7	0.2	0.40
Ability to navigate an electronic health record	2.9	2.6	0.3	0.19
Documented training in quality and practice improvement	2.9	2.8	0.1	0.74
List of clinical rotations completed during medical school	2.9	2.3	0.7	**0.02**
Ability to engage in independent research	3.0	3.0	0.0	0.70
Ability to obtain informed consent	3.0	3.0	0.0	0.73

TABLE IV: CHANGE IN AVERAGE SCORES BETWEEN ROUNDS 2 AND 3 (CONTINUED)

Item	Round 3	Round 2	Δ	p
Performance in mock page assessment	3.0	2.9	0.1	1.00
Self-assessments / evaluations	3.0	2.9	0.1	0.60
Results of knowledge-based assessments	3.0	2.8	0.2	0.58
Training received about inter- and intra-personal skills	3.0	2.6	0.5	0.10
Estimated ability to eventually function as a surgeon	3.0	2.7	0.3	0.27
Ability to interpret medical images	3.1	2.9	0.2	0.64
Realistic understanding of life of surgeon	3.1	2.8	0.3	0.12
Grit Scale scores	3.3	3.1	0.2	0.21
USMLE scores	3.3	3.0	0.4	0.19
Global housestaff readiness score (ACS-ERRA)	3.4	2.9	0.5	**0.04**
List of surgical disease processes in patients seen	3.6	3.4	0.2	0.09

TABLE V - FINAL LIST OF CONSENSUS ITEMS ORGANIZED BY FINAL SCORE

Extent and context of the letter writer's contact with the individual
Ability to communicate with others
Assessment of professional behavior
Discernment (knowing when to ask for help)
Insight into own performance
Completion of residency prep course (Boot Camp) and its curriculum design / timing
Self-management and internal motivation
Demonstration of adaptable and growth oriented behavior
Recommendations for remediation if needed upon starting residency
Organizational skills
Work ethic
Response to feedback
Level of entrustability for all 13 EPAs with inclusion of methodology used for assessment
Ability to function independently
Ability to find information and fill knowledge gaps
Unique characteristics
Assessment of technical skills
Problem-solving ability
Assessment of patient evaluation and decision making
A list of specific high and low performing personal attributes
Oral presentations skills
Ability to create therapeutic relationships with patients

TABLE VI: QUALITATIVE ANALYSIS OF EXPERT COMMENTS

Theme	Frequency	Quotes
Minimize redundancy	67	"While this is something that is usually included in the narrative portion of MSPE, I think a surgery-specific mention of characteristics that are relevant to performance in surgery specific domains [would be useful]." *[MS4 Director]* "If the hand-off document is to be truly useful, the PD shouldn't have to refer to the MSPE or transcript for information they want." *[MSPE Writer]* "Letters of rec are not asked to address this, nor are they reliable for actual assessments - everything is glowing in most letters." *[MS4 Director]* "This is raising a lot of questions about redundancy - if this is meant to be a supplement to the MSPE and residency application, a lot of the objective components already part of those things don't need to be in a[n educational handover] letter." *[Resident]*
Optimize impact	57	"The small red flags that accumulate for a given trainee don't always find their way into a single repository; this is vital information." *[MS4 Director]* "The need for remediation of a minor issue (one that would not have precluded graduation, but that would make a difference in the resident's performance) is essential for the PD to know about." *[MSPE Writer]* "Although subjective, this could provide the PD with a base on which to co-build a learning plan with the new resident." *[MSPE Writer]* "I think this will help residency programs plan for orientation." *[Resident]*
Use appropriate assessments	72	"The absence of a uniform rating instrument is no excuse for not including a summary statement of the applicant's professional behavior, particularly if there have been significant and/or recurrent (not developmental) lapses." *[MSPE Writer]* "The level of entrustability does not mean anything to a PD, unless there is methodology involved. If a medical school says that they can entrust someone for independent practice, it doesn't mean that you can trust them." *[Resident]* "This would depend on whether the institution that was responsible had reliable raters that engaged in rater training." *[Resident]* "There may not be many opportunities for this to occur in medical school or instances of being observed by a faculty member." *[MS4 Director]*

TABLE VI: QUALITATIVE ANALYSIS OF EXPERT COMMENTS (CONTINUED)

Theme	Frequency	Quotes
Mitigate risk	14	"I'm concerned that this would paint the new recruit in a negative light, which could adversely affect the opinion others have of [them]." *[Resident]* "If remediation is needed at the start of residency they should not be graduating from medical school." *[Program Director]* "The other interns will be upset if one person is singled out and has an easier schedule." *[Resident]* "Nobody will mention the low performance ones." *[MS4 Director]* "What program director is going to rely on med school training?" *[MSPE Writer]*

Discussion

This study provides the framework for an educational handover letter from undergraduate to graduate medical education in General Surgery. Through quantitative and qualitative analysis of expert consensus of involved stakeholders, the content of such a letter as well as the principles guiding its creation are described. A proposed template for such a letter is included. (APPENDIX)

Although the experts have described 22 unique elements as appropriate for inclusion in the letter, it is unlikely that most institutions would have assessments available to comment on each of these. Further, it would be counterproductive for the letter to include comments in areas where a student is neither a high nor low performer. The primary goal of the letter is to provide residency programs the opportunity to capitalize on areas of unique strength and provide early, focused remediation for areas of deficiency in their incoming trainees. As such, those areas of appropriate, but not exceptionally strong or weak performance should not receive comment. Additionally, those items that fall beyond the scope of a specific school's assessment system should not receive comment either. In practice, therefore, it is likely that only a subset of the identified items will be used.

The qualitative analysis performed of the experts' comments identified four themes that provide guidance for the further development and implementation of an educational handover letter. These focus on minimizing redundancy with existing information, selecting items that will optimize the letter's impact, assuring the information in the letter is based on appropriate assessments and mitigating the risk such a letter may pose to the learner as well as to their medical school.

Redundancy in the letter has been addressed by the experts through their selection of unique elements. None of the selected elements are routinely available in the other information sources programs receive about incoming residents. It is for this reason that although "ability to function in a team" was identified in the final consensus round, it was removed due to its significant overlap with AAMC EPA 9: "Collaborate as a Member of an Interprofessional Team." As the mechanism for data collection and letter creation is determined, it will be important to assure no duplication occurs.

Assuring the meaningful, positive impact of the letter will require attention to the details of a student's professional development. As the experts noted in their comments, an area of possible significant benefit from the letter for both the learner and the program is the identification of small areas in need for improvement. The types of issues that are, usually appropriately, deemed too insignificant to warrant mention in MSPEs or letters, are ideal for communication through an educational handover letter. As was identified, the student with major fundamental deficiencies should not be allowed to graduate from medical school. Remediation of this type of gap is inappropriate to assign to a residency

program. However, if the program is aware of less significant areas in need for improvement, these can readily be addressed through targeted training early in residency.

The assessments utilized to inform the letter must be appropriate to the task. It stands to reason that some schools will not be able to provide information for all 22 of the items identified in this study. To enhance the value of the letter, it will be important for schools to provide the background of how the items they choose to include were assessed. It is likely that the letter will look different for each school that utilizes it.

An educational handover letter is not without risk to the medical school or the learner. A recent scoping review on the impact of prior performance information, such as that an educational handover letter would provide, showed that it may influence future evaluation. Although not specific to medical education, this review raises concern for an assimilation effect with current performance evaluations trending towards the prior evaluations. (Humphrey-Murto et al. 2019) This is an important concern, but is less likely to be of influence in the setting of educational handover letters based on the limited distribution of this information within a residency program. Presumably only the Program Director would be aware of the prior evaluations while the majority of assessments in residency are performed by other raters. Thus, the influence of this information on residency evaluations would likely be diminished. This risk may also be reduced by providing a copy of the letter to the student such that they may be aware of its content, though not able to edit its content. Ideally, the letter would be part of a conversation between the student and their medical school as well as their future residency resulting in an educational plan.

The risk to a medical school, however, may be more difficult to navigate. A reasonable concern is that the medical schools, having sent a favorable MSPE accompanied by their faculty's positively worded letters of recommendation, are now sending another letter potentially detailing shortcomings in the same person that were not previously disclosed. While arguments can be made about what the ideal content of the MSPE should be, that document is not designed to include the information contained in an educational handover letter. In Internal Medicine, it has been shown that 11-15% of students are identified by their clerkship directors (core rotations and beyond) as "struggling." (Frellsen et al. 2008) However, a significant proportion of those students do not ultimately receive grades or other action that would initiate an oversight process culminating with inclusion in the MSPE. This is precisely the information, however, a residency program can use to fill knowledge and performance gaps before they become problematic.

Participants identified the AAMC's Core Entrustable Professional Activities (EPAs) for Entering Residency as an element for inclusion in the letter. (AAMC 2014; ten Cate 2005) Some may consider

these EPAs to be equivalent to an educational handover letter in that they provide an assessment of key knowledge, skills and attitudes that are required of physicians. Understanding a learner's progress along the pathway to entrustability in the 13 EPAs is likely to be valuable to residency programs as this will highlight areas in need of remedial education. However, the existing mechanisms for an entrustability decision by medical schools are in varying states of development. (Brown et al. 2017) Program Directors in General Surgery have also expressed concerns about early resident ability with the EPAs. (Lindeman, Sacks, and Lipsett 2015) Further, across institutions there is variability in the definition and use of EPAs. (Meyer et al. 2019) Therefore, as the experts identified, it will be critical to understand the methodology by which the entrustment decision was reached to enhance the value of this information.

Significant prior work on educational handover has occurred. In some cases, this process is referred to as a "feed-forward" letter. It has been proposed, however, that "feed-forward" be used to distinctly refer to information passed along in a time-based curriculum in "exceptional circumstances where academic assistance is recommended because a learner is in difficulty, and targeted remediation or intervention is necessary to address concerns identified." (Royal College of Phyisicans and Surgeons of Canada 2018) The educational handover, however, refers to the provision of relevant information to support a learner's progression through the stages of training.

Previous studies have involved providing residency programs with the Accreditation Council on Graduate Medical Education (ACGME) Level 1 specialty-specific Milestones. In the current version for General Surgery, as for OB/GYN and some others, this level is defined as "the resident is demonstrating milestones expected of an incoming resident."(ACGME 2015) Several specialties at the University of Michigan have shown that existing medical school assessments can be used to assign scores on the majority of the Level 1 Milestones and routinely provide this to Surgery, OB/GYN, Pediatrics and Emergency Medicine residency programs at which their students match. (H. Morgan et al. 2016; Wancata et al. 2017; Sozener et al. 2016; Schiller et al. 2018) However, while this is useful for identifying their early progress on the Milestones, it was not found to be descriptive of the overall attributes of new residents. (H. K. Morgan et al. 2018)

The experts in the present study considered the Level 1 Milestones for inclusion in an educational handover letter, but scored it at "could be included or excluded" in both rounds without a difference between groups. It was therefore not included in the final document. Comments noted that some felt the EPAs were better a estimate of ability for entering residents given they were designed explicitly for this purpose, while the Milestones were designed for residents. With the changes coming in the next version of Milestones in July, 2020, Level 1 is no longer defined in any way and as such the value of this assessment may be reduced as a handover tool. ("ACGME Surgery Milestones" 2019)

Other substantial prior work on this type of educational handover has been done in Canada where a national model has been proposed. (Busing et al. 2018) The Canadian framework works to encompass all transitions from undergraduate medical education through practicing physician. The medical school to residency portion of the model utilizes EPAs and a "Learner Educational Handover Protocol" (LEH). The 12 Pan-Canadian EPAs are similar to the AAMC's EPAs. (AFMC 2016) The LEH is currently in beta testing with hopes for adoption nationally in the future. The content of the protocol is not yet published.

The concept of incorporating a component of feedback from the residency program to the medical school has also been proposed. (Warm et al. 2017) This would potentially diminish some of the risk to medical schools by keeping them in an ongoing conversation about how their learners continue to develop in graduate education. This also creates a potential target for educational innovation to identify and fill gaps in the undergraduate medical curricula.

Students with unprofessional behavior and who are unable to improve are associated with becoming physicians with medical board disciplinary action. (Papadakis et al. 2005). Although the MSPE template now contains a dedicated statement of professionalism, only 68% of schools were found to include one. (Hook et al. 2018) Further, the comments tend to be minimized. (Shea et al. 2008) Identification of these students would ideally occur before the Match. However, early awareness and intervention by residency programs is more likely to lead to effective remediation than slow discovery through poor interactions. (Warburton, Goren, and Dine 2017; Minter et al. 2014)

Technical skill was identified as an important aspect of the letter. As this is a broad topic, institutions will need to focus on the elements they are able to effectively evaluate. The most likely source of this information would come from a residency prep course program where learners have the opportunity to independently perform skills and receive feedback. There is no single test that has been identified to reliably correlate with skills performance in residency. (Louridas et al. 2016) However, it is reasonable that a prep course or acting internship director should be able to provide an overall assessment for the skills they have observed and provide a determination as to whether this should be an area of focused instruction as the trainee begins residency.

A limitation of the study derives from the panel of experts being selected among those with great experience in academic medical education. Although a diverse panel was intentionally sought, there is not representation from smaller, community-based residency programs. As such, it is possible that the information those programs would benefit from is not taken into account here. Another potential limitation is the lack of input from medical students. Certainly, they are a stakeholder. However, their lack of experience with the transition to residency puts them at a disadvantage for understanding what

information would be useful for their future Program Directors to help them succeed. It is encouraging that prior work evaluation educational handovers that included students found them in support of such an endeavor. (Kassam et al. 2019)

The next step for this work will be to ascertain the best mechanism for the collection and organization of the data to create a letter. At our institution, this will involve working with the medical school faculty to determine which assessments are available or could be implemented to provide information for which of the identified elements. As a part of this, it will be necessary to pilot test the proposed template. Following distribution of the letter, the final step will be to assess the impact on the learner, residency program and medical school.

It is unlikely that the items identified here as appropriate for an educational handover letter in General Surgery would be immediately applicable to other specialties. A future step may involve obtaining separate consensus from the other primary specialties in which interns may train.

V. Conclusion

This study provides expert consensus of the major stakeholders on the content of an educational handover letter from undergraduate to graduate education in General Surgery. Further, comments from the experts provide guidance on the implementation and use of such a letter. The goal is for residency programs to incorporate this information into decision-making regarding early year scheduling assignments and education programs for new trainees. Ultimately, this letter should allow new residents to accelerate their learning curve by providing their training programs with the information necessary to optimize their education.

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Humphrey-Murto, Susan, Lara Varpio, Timothy J. Wood, Carol Gonsalves, Lee-Anne Ufholz, and Thomas Foth. 2017. "The Use of the Delphi and Other Consensus Group Methods in Medical Education." *Academic Medicine*. https://doi.org/10.1097/ACM.0000000000001204.Purpose.

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Wancata, Lauren M., Helen Morgan, Gurjit Sandhu, Sally Santen, and David T. Hughes. 2017. "Using the ACMGE Milestones as a Handover Tool From Medical School to Surgery Residency." *Journal of Surgical Education* 74 (3): 519–29. https://doi.org/10.1016/j.jsurg.2016.10.016.

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APPENDIX: EDUCATIONAL HANDOVER LETTER TEMPLATE

Date: Trainee Name:

Letter Writer Name: Title:

Extent and context of the letter writer's contact with the trainee:

Recommendations for focused instruction upon starting residency ☐ None

Unique characteristics:

A list of specific high and low performing personal attributes

		Exceptional ability	No concerns	Should be a focus for early teaching	Unable to assess
Self-Awareness	Discernment (knowing when to ask for help)	☐	☐	☐	☐
	Insight into own performance	☐	☐	☐	☐
	Self-management and internal motivation	☐	☐	☐	☐
	Comments and assessment method:				
Potential for Growth	Response to feedback	☐	☐	☐	☐
	Work ethic	☐	☐	☐	☐
	Ability to find information and fill knowledge gaps	☐	☐	☐	☐
	Demonstrates adaptable and growth oriented behavior	☐	☐	☐	☐
	Comments and assessment method:				
Readiness for Residency	Assessment of technical skills	☐	☐	☐	☐
	Problem-solving ability	☐	☐	☐	☐
	Assessment of patient evaluation and decision making	☐	☐	☐	☐
	Oral presentations skills	☐	☐	☐	☐
	Organizational skills	☐	☐	☐	☐
	Ability to function independently	☐	☐	☐	☐
	Comments and assessment method:				
Inter-Personal Skills	Assessment of professional behavior	☐	☐	☐	☐
	Ability to create therapeutic relationships with patients	☐	☐	☐	☐
	Ability to communicate with others	☐	☐	☐	☐
	Comments and assessment method:				

		Attached	Not available
Other Assessments	Level of entrustability for all 13 EPAs (including assessment methods)	☐	☐
	Residency prep course (Boot Camp) and its curriculum design / timing	☐	☐

Additional Comments:

VITA

PERSONAL INFORMATION

Name: Lipman, Jeremy Michael

Education

School: Boston College
Degree: Bachelor of Arts
Dates: September, 1995 – May, 1999

School: University of Pennsylvania
Degree: Post-Baccalaureate (no degree)
Dates: September, 1999 – May,2000

School: Drexel University, College of Medicine
Degree: Doctor of Medicine
Dates: August, 2000 – May, 2004

School: University of Illinois, Chicago
Degree: Masters in Health Professions Education (Anticipated)
Dates: July, 2016 – July, 2019

Post-Graduate Training

Institution: Case Western Reserve University, School of Medicine
Position: Resident in General Surgery
Dates: July, 2004 – June, 2009

Institution: Cleveland Clinic Foundation
Position: Fellow in Colorectal Surgery
Dates: July, 2009 – June, 2010

Contact Information

Office Address: Cleveland Clinic
Department of Colorectal Surgery
A3-266
9500 Euclid Avenue
Cleveland, Ohio 44195
Office Phone: 216-444-4093
E-mail: Jeremy.Lipman@gmail.com

PROFESSIONAL APPOINTMENTS

Position/Rank: Staff Colorectal Surgeon
Institution/Department: Cleveland Clinic, Digestive Disease and Surgery Institute
Dates: September, 2016 – Present

Position/Rank:	Section Head, Colorectal Surgery
Institution/Department:	MetroHealth Medical Center, Department of Surgery
Dates:	June, 2015 – August, 2016

Position/Rank:	Staff Colorectal Surgeon
Institution/Department:	MetroHealth Medical Center, Department of Surgery
Dates:	July, 2010 – June, 2015

ACADEMIC APPOINTMENTS

Position/Rank:	Associate Professor of Surgery
Institution/Department:	Cleveland Clinic Lerner College of Medicine of Case Western Reserve University
Dates:	September, 2016 - Present

Position/Rank:	Associate Professor of Surgery
Institution/Department:	Case Western Reserve University, School of Medicine
Dates:	July, 2016 – August, 2016

Position/Rank:	Assistant Professor of Surgery
Institution/Department:	Case Western Reserve University, School of Medicine
Dates:	July, 2010 – June, 2016

CERTIFICATION AND LICENSURE

Name of Board:	American Board of Colon and Rectal Surgery
Date of Certificate:	September 17, 2011
Number:	2216
Date Issued:	September, 2011 – 2021

Name of Board:	American Board of Surgery
Date of Certificate:	October 20, 2009
Number:	054581
Date Issued:	October, 2009 – July, 2020

Name of Board:	State Medical Board of Ohio
Date of Certificate:	January 16, 2009
Licensure Number:	35.092896
Date Issued:	January, 2009 – July 1, 2020

HONORS AND AWARDS

Donald R. Cooper, MD Award for Excellence in Surgery

Drexel University, College of Medicine
May, 2004

ABSITE Award for Highest Score
Case Western Reserve University, School of Medicine
June, 2006
June, 2009

Finalist, Cleveland Surgical Resident Research Competition
Cleveland Surgical Society
May, 2007
May, 2008

Junior Resident Teaching Award
Case Western Reserve University, School of Medicine
June, 2007
June, 2008

Michael W.L Guarderer Award in Pediatric Surgery
Case Western Reserve University, School of Medicine
June, 2008

Administrative Chief General Surgery Resident
Case Western Reserve University, School of Medicine
July, 2008 – June, 2009

Debra J. Graham Teaching Award
Case Western Reserve University, School of Medicine
June, 2009

Outstanding Clinical Fellow Award
Cleveland Clinic Foundation, Department of Colorectal Surgery
June, 2010

Faculty Teaching Award for Department of Surgery
Case Western Reserve University, School of Medicine
June, 2012

Scholarship in Teaching Award
Case Western Reserve University, School of Medicine
February, 2013
"Surgery Boot Camp"
February, 2014
"Early Exposure to Laparoscopic Technology Generates Interest in Surgery Among Medical Students"
March, 2015
"Integration of an Emergency Medicine Rotation into a Surgery Clerkship: Impact on Student Performance and Satisfaction"
March, 2016
"Defining Honors in the Surgery Clerkship"
March, 2019
"Application of Gamification Theory to Graduate Medical Education of General Surgery Trainees"
"QIC: An Interactive, Team-Based Quality Improvement Curriculum for Surgical Residents"

Surgical Education Research Foundation Fellowship

Association for Surgical Education
2013

Kaiser-Permanente Award for Excellence in Teaching
Case Western Reserve University, School of Medicine
May, 2014

Academy of Clerkship Directors
Association for Surgical Education
Inducted April, 2015

Alpha Omega Alpha
Case Western Reserve University, School of Medicine
May, 2015

Best Doctors in America List
2015-2016

Association for Surgical Education, Philip J. Wolfson Outstanding Teacher Award
2016

Fellow, Academy of Scholar Educators, Case Western Reserve University, School of Medicine
2016

Best Course Paper, Scholarship in Health Professions Education (MHPE 501)
2017

Golden Key Honor Society, University of Illinois, Chicago, selected for membership
2017

Cleveland Magazine "Best Doctor"
2018, 2019

MEMBERSHIP IN PROFESSIONAL SOCIETIES
American College of Surgeons, 2004 - Present
American Society of Colon and Rectal Surgeons, 2008 - Present
Association for Surgical Education, 2011 - Present
Association of Program Directors in Surgery, 2016 - Present
Consortium of American College of Surgeons Accredited Education Institutes, 2017 - Present
Society of American Gastrointestinal and Endoscopic Surgeons, 2017 - Present
Cleveland Ostomy Association, 2010 – 2016
Crohn's and Colitis Foundation of America, 2013 – 2019
Ohio Chapter of the American College of Surgeons, 2012 – 2015
Midwest Surgical Association, 2011 – 2015
Cleveland Surgical Association, 2011 – 2015

PROFESSIONAL SERVICES
Reviewer

American Journal of Surgery, 2013 - Present
Annals of Surgery, 2010, 2016, 2019
Association of American Medical Colleges
2014 and 2016 Medical Education Meeting
British Journal of Surgery, 2015 – Present

Colorectal Disease, 2019 - Present
Diseases of the Colon and Rectum, 2018 - Present
Journal of the American College of Surgeons 2019 - Present
Journal of Surgical Education, 2018 – Present
Journal of Surgical Research, 2018 – Present
Medical Education Online, 2018 - Present
MedEd Portal, 2012 – Present
Surgical Endoscopy, 2018 – Present
Teaching and Learning in Medicine, 2018 – Present
The Surgeon, 2011 – Present
Southern Illinois University Mock Page Program, 2015
Surgery, 2019 - Present

Question Writer

American Board of Surgery
Complex General Surgical Oncology Examination, 2017 - Present

COMMITTEE SERVICE

National

Association for Surgical Education:
Chair, Assessment, Curriculum and Evaluation Committee
2019 - Present
Vice Chair, Curriculum Committee (merged into Assessment, Curriculum and Evaluation, 2019)
2017 – 2019
Member 2011 – Present
Graduate Medical Education Committee
2018 - Present
Assessment Committee
2016 – 2018
Clerkship Directors Committee
2011 – 2016

American Society of Colon and Rectal Surgeons:
Residents' Committee
Vice Chair 2016 - Present
Member 2012 – 2016

Fundamentals of Rectal Cancer Surgery Committee
Vice-Chair 2018 - 2019
Member 2017-Present

American College of Surgeons:
Committee on Medical Student Education
2015 – Present

ACS/APDS/ASE Resident Prep Curriculum
Steering Committee
2017-Present
Vice Chair, Research & Assessment Subcommittee
2017 – Present
Member
2016 – Present

Validation and Verification of Surgical Knowledge and Skills Subcommittee on Resident Selection
2017 – Present

Association of Program Directors in Surgery
Program Committee
2018 - Present

Regional
Crohn's and Colitis Foundation of America
Northeast Ohio Chapter, Medical Advisory Committee, 2013 – 2019

Ohio Chapter of the American College of Surgeons
Program Committee, 2014

Hospital Affiliate

MetroHealth Medical Center:
Pre-Surgical Evaluation Committee
2010 – 2012

Web Site Development Committee
2010 – 2014

Physician Advisor Task Force for Office of Patient Experience
2014 – 2016

Provider Performance Monitoring Committee
2014 - 2016

Educational Committees
General Surgery Residency Committee
Case Western Reserve University, School of Medicine
2005 – 2016

Simulation Center Steering Committee
MetroHealth Medical Center
2012 – 2016

Clinical Curriculum Council
Case Western Reserve University, School of Medicine
2012 – 2016

Joint Clinical Oversight Group
Case Western Reserve University, School of Medicine
2012 – 2016

Faculty Advisor to Holden Society (Medical Student Surgery Interest Group)
Case Western Reserve University, School of Medicine
2012 - Present

Clinical Competency Committee
Case Western Reserve University, School of Medicine
Co-Chairperson
2013 – 2016

Anatomy Committee, Case Western Reserve University School of Medicine

Case Western Reserve University, School of Medicine
2014

Clinical Leadership Committee
MetroHealth Medical Center
2014 - 2016

Professionalism Working Group
Case Western Reserve University, School of Medicine
2014 – 2015

Committee on Medical Education – Elected Member
Case Western Reserve University, School of Medicine
2015 – 2018

Search Committee for Assistant Dean for Student Affairs
Case Western Reserve University, School of Medicine
2015
2019

General Surgery Education Committee
Cleveland Clinic
September, 2016 – Present

Clinical Competency Committee – Colorectal Surgery Residency
Cleveland Clinic
November, 2016 – Present

Graduate Medical Education Committee
Cleveland Clinic
July, 2017 - Present

TEACHING ACTIVITIES

Curriculum/Course Development

1. Surgery Boot Camp (SURG4002B)
   Course director and curriculum designer
   Senior Medical Students
   2012 – 2016

2. Hopkins MA (author); Macari M (section author); Lipman J, Moorman M, Nepomnayshy D (assessment); Sanso L (additional information). Appendicitis. In Hopkins MA, Alseidi A (eds): WISE-MD. http://wise-md.med.nyu.edu, 2015

3. ACS / APDS / ASE Residency Prep Curriculum (prepcurriculum.facs.org)
   "Excision, Debridement and Local Anesthesia"
   December, 2017

4. ACS/ASE Medical Student Core Curriculum
   "Vomiting, Diarrhea and Constipation"
   January, 2018

5. American Board of Surgery SCORE curriculum

Crawshaw, B, Lipman, JM. "Laparoscopic Small Bowel Resection", 2013.
Lee, JK, Lipman, JM. “Anal Dysplasia and Sexually Transmitted Diseases”, 2013
Visioni A, Lipman, JM. “Abdominoperineal Resection and Pelvic Exenteration”, 2013
Lipman, JM. “Anal Fissure and Hemorrhoids”. Multiple Choice Questions, 2015
Lipman, JM. “Anorectal – Benign” Multiple Choice Questions, 2018
Lipman, JM. Anal Dysplasia and STDs, 2018

6. Surgery Education Research Fellowship, ACS-AEI Accredited
   Fellowship Director and curriculum designer
   1 fellow every 2 years
   2018 – Present

Teaching Administration

1. Director of Surgical Education
   Metrohealth Medical Center, Department of Surgery
   2012 – 2016

2. Associate Program Director, General Surgery Residency
   Case Western Reserve University, School of Medicine
   2012 – 2016

3. Clerkship Director, General Surgery Clerkship
   MetroHealth Medical Center
   2012 – 2016

4. Scholars Collaboration in Teaching and Learning
   Case Western Reserve University, School of Medicine
   2012

5. Surgeons as Educators Course
   American College of Surgeons
   September 14 – 19, 2014

6. Millennium Conference on Transforming the Post-Clerkship Curriculum
   Carl J. Shapiro Institute for Education and Research at Harvard Medical School
   May 6 -8, 2015

7. Clinician Educator, MedU Science
   Basic Science Core Discipline Curriculum. MedU Science. eds. Fulton, Poznanski and Fall. Hanover, NH: MedU, July 2015. Available from: http://www.med-u.org

8. Discourse, LLC
   Advisory Board
   2015 – 2017

9. Advisor: Surgical Education Research Fellowship
   Association for Surgical Education
   April, 2016 – Present

10. Associate Program Director, General Surgery Residency
    Cleveland Clinic

September, 2016 – January, 2017

11. Program Director, General Surgery Residency
    Cleveland Clinic
    January, 2017 – Present

12. Fellowship Director, Surgical Education Research Fellowship - ACS-AEI Accredited
    Cleveland Clinic
    July, 2018 - Present

RESEARCH SUPPORT

1. Ethicon Educational Grant
   Surgery Boot Camp
   $5,000 plus suture material
   February 10 – March 7, 2014

2. Sampliner Family Education Research Fellowship
   $280,000
   May, 2017 - Present

BIBLIOGRAPHY

Peer Reviewed Articles

1. Lipman J, Velanovich V. Reasons patients refuse breast cancer treatment. Surgical Rounds 2002; 25(12): 604-607.
2. Alaedeen D, Lipman J, Rosen M, The single staged approach to the surgical management of abdominal wall hernias in contaminated fields. Hernia 2007;11(1):41-5.
3. Lipman J, Medalie D, Rosen M. Staged repair of massive incisional hernias with loss of abdominal domain: a novel approach. American Journal of Surgery 2008;195(1):84-8.
4. Lipman J, Claridge J, Haridas M, Martin M, Yao D, Grimes K, et al. Preoperative findings predict conversion from laparoscopic to open cholecystectomy. Surgery 2007;142(4):556-63.
5. Lipman, J, Reynolds, H. Laparoscopic management of diverticular disease. Clinics in Colon and Rectal Surgery 2009; 22(3): 173-180.
6. Lipman, J, Marderstein, E, Zeinali, F, Phitayakorn, R, Ponsky, J, Delaney, C. Objective evaluation of the performance of surgical trainees on a porcine model of open colectomy. British Journal of Surgery 2010; 97(3): 391-5.
7. Lipman, J, Kiran, P, Shen, B, Remzi, F, Fazio, V. Peri-operative Factors During Ileal Pouch Anal Anastomosis Predict Pouchitis. Diseases of the Colon and Rectum. 2011; 54(3):311-7.
8. Gurland, B, Lipman, JM. Surgical Treatment of Constipation. In: UpToDate, Basow, DS (Ed), UpToDate, Waltham, MA, 2010.
9. Lee, JK, Delaney, C, Lipman, JM. Current State of the Art in Laparoscopic Colorectal Surgery for Cancer: Update on the Multi-Centric International Trials. Annals of Surgical Innovation and Research. 2012 Jul 30;6(1).
10. Kalady, MF, Lipman, JM, McGannon, E, Church, JM. Colon Cancer Risk after Proctectomy for HNPCC Patients with Rectal Cancer. Annals of Surgery 2012; 255(6):1121-1125.
11. Rothermel, L, Lipman JM. "Estimation of Blood Loss is Inaccurate and Unreliable". Surgery. 2016 Oct;160(4):946-53
12. Lipman, JM, Schenarts, K. "Defining 'Honors' in the Surgery Clerkship". Journal of the American College of Surgeons. 2016 Oct;223(4):665-9
13. Wunder, J, Brandt, C, Lipman JM. "A Surgical Residency Preparatory Course for Senior Medical Students Leads to Earlier Independence in ACGME Competencies". American Journal of Surgery. 2018 Feb;215(2):309-314
14. Lipman JM, Hollands CM, reviewers. Selected Readings in General Surgery. 2017:43(4):e1. http://web2.facs.org/SRGS_Connect/wysk/wysk0917.cfm. Accessed September 25, 2017. Review of: Lau JN, Mazer LM, Liebert CA, Merrell SB, Lin DT, Harris I. A Mixed-Methods Analysis of a Novel Mistreatment Program for the Surgery Core Clerkship
15. Arumpanayil , A, Winkelman, C, McConnell, K, Pelyak, M, Brandt, C, Lipman, JM. "Attitudes Towards Communication and Collaboration After Participation in a Mock Page Program: A Pilot of an Inter-professional Approach to Surgical Residency Preparation" Journal of Surgical Education June, 2018

16. Lavryk OA, Stocchi L, Hull TL, Gorgun E, Shawki S, Lipman JM, Holubar SD, Delaney CP, Steele SR. Factors Associated with Long-Term Quality of Life After Restorative Proctocolectomy with Ileal Pouch Anal Anastomosis. Journal of Gastrointestinal Surgery. 2018 Jan 1:1-9.
17. Williams, A., Mann, B,, Lipman, JM, "Understanding the Modern Surgery Journal Club" Journal of Surgical Education, October 14, 2018
18. Benlice C, Holubar SD, Gorgun E, Stocchi L, Lipman JM, Kalady MF, Champagne BJ, Steele SR. Extended Venous Thromboembolism Prophylaxis After Elective Surgery for IBD Patients: Nomogram-Based Risk Assessment and Prediction from Nationwide Cohort. Diseases of the Colon & Rectum. 2018 Oct 1;61(10):1170-9
19. Novello M, Stocchi L, Holubar S, Shawki S, Lipman J, Gorgun E, Hull T, Steele SR. Surgical outcomes of patients treated with ustekinumab vs. vedolizumab in inflammatory bowel disease: a matched case analysis. International journal of colorectal disease. 2018 Dec 10:1-7.
20. Ritter KA, Burke JP, Stocchi L, Aiello A, Holubar S, Ashburn JH, Lipman JM, Shawki S, Hull T. Postoperative Steroid Taper Is Associated With Pelvic Sepsis After Ileal Pouch-anal Anastomosis. Inflammatory Bowel Diseases. 2018 Dec 28.
21. French JC, Zolin SJ, Lampert E, Aiello A, Bencsath KP, Ritter KA, Strong AT, Lipman JM, Valente MA, Prabhu AS. Gender and Letters of Recommendation: A Linguistic Comparison of the Impact of Gender on General Surgery Residency Applicants. Journal of Surgical Education. 2018 Dec 28.
22. Lipman, JM, Stocchi, L. Mechanical Issues of the Pelvic Ileal Pouch. Seminars in Colon and Rectal Surgery, 2019
23. Shawki S, Steele S, Lipman J, Lee CH, Stocchi L, Hull T, Gorgun E, Holubar S. Kock pouches in the 21st century: a descriptive study of short-term (30-day) outcomes in a national cohort of 177 patients. Journal Of Crohns & Colitis 2019 Mar 1 (Vol. 13, pp. S399-S399).
24. Zhang, CZ, Lipman, JM, Jensen, RM, Parekh, K. Thematic Analysis of Emergency Medicine Applicants' Personal Statements. Medical Science Educator. 2019 May 29.
25. Ritter KA, Leifer D, Orabi D, Prabhu A, French J, Lipman JM. How We Do It: Creation of a Low-Cost Endoscopic Skills Model for Fundamentals of Endoscopic Surgery Training. Journal of Surgical Education. 2019 Jun 22.

Book Chapters

1. J. Lipman, "Abdominal Wall Anatomy and Ostomy Sites," in Netter's Surgical Anatomy and Approaches, C. Delaney, Ed. Elsevier, 2014, pp. 245-256.
2. J Calvin Coffee and J. Lipman, "General Techniques in Mesenteric Based Colorectal Surgery," in Mesenteric Principles of Gastrointestinal Surgery, Basic and Applied Science, J.C. Coffee, Ed. Taylor & Francis Group, LLC, 2017, Chapter 16.
3. Ritter, K and Lipman, JM, "General Surgery Boot Camp for Graduating Medical Students," in Boot Camp Approach to Surgical Training, O. Safir, R. Sonnadara, P. Mironova, R. Rambani, Eds. Springer, 2018
4. Rosen, RD and Lipman, JM "Transverse Colectomy" in Netter's Surgical Anatomy and Approaches, C. Delaney, Ed. Elsevier, IN PRESS
5. Park, L and Lipman, JM. "The Surgical Management of Constipation," in Current Surgical Therapy, 13th edition, Cameron and Cameron, Ed. Elsevier. IN PRESS
6. Ritter, K and Lipman, JM. "Pre-Operative and Post-Operative Patient Care," in Surgery Morning Report: Beyond the Pearls. Williams, Ed. Elsevier, IN PRESS

National Abstract Podium Presentations:

1. Lipman J, Claridge J, Haridas M, Martin M, Yao D, Grimes K, et al. Preoperative findings predict conversion from laparoscopic to open cholecystectomy. Surgery 2007;142(4):556-63.
   Podium presentation at the 64th annual meeting of the Central Surgical Association, Chicago, Illinois, March 8-10, 2007.
2. Lipman, J, Marderstein, E, Zeinali, F, Phitayakorn, R, Ponsky, J, Delaney, C. Objective evaluation of the performance of surgical trainees on a porcine model of open colectomy. British Journal of Surgery 2010; 97(3): 391-5.
   Podium presentation at the American College of Surgeons 94th Annual Clinical Congress, Surgical Forum, San Francisco, CA, October 12-16, 2008.
3. Kalady, MF, Lipman, JM, McGannon, E, Church, JM. Colon Cancer Risk after Proctectomy for HNPCC Patients with Rectal Cancer. Annals of Surgery 2012; 255(6):1121-1125.
   Podium presentation at the American College of Surgeons, Washington DC, October 3-7, 2010.
4. Wunder, J, Brandt, CP, Lipman, JM. "A Surgical Residency Preparatory Course Leads to Earlier Independence in ACGME Competencies".
   Podium presentation: Association for Surgical Education Annual Meeting, Seattle, WA, April 23-25, 2015.
5. Lipman, JM, Schenarts, K. "Defining 'Honors' in the Surgery Clerkship".

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6. Rothermel, L, Lipman JM. "Estimation of Blood Loss is Inaccurate and Unreliable". Podium presentation: Central Surgical Association Annual Meeting, Montreal, QC, March 11, 2016
7. Ritter, K, Nassar, A, Horne, C, French, J, Prabhu, A, Lipman, JM. Team Competition Promotes Resource Utilization in General Surgery
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8. Arumpanayil, A, Winkelman, C, McConnell, K, Pelyak, M, Lipman, JM. Attitudes Towards Communication and Collaboration After Participation in a Mock Page Program: An Inter-Professional Approach to Surgical Residency Preparation.
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9. Ritter, K, Horne, C, Nassar, A, French, J, Rosen, M, Walsh, R, Prabhu, A, Lipman, JM. "Team Competition Impacts ABSITE Scores in General Surgery Residents"
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Poster Presentations:

1. Lipman J, Medalie D, Rosen M. Staged repair of massive incisional hernias with loss of abdominal domain: a novel approach. American Journal of Surgery 2008;195(1):84-8.
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3. Wunder J, Brandt C, Kroh M and Lipman, JM, "The Impact of an Integrated Surgery and Emergency Medicine Clerkship on Student Performance and Satisfaction".
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5. Naples, R, French, J, Prabhu, A, Lipman, JM. "Resident Opinions of the Value and Optimal Content of a Technical Skills Curriculum Using Simulation."
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Video Presentations

1. Petro, C, Brandt, C, Lipman, JM, "Larparoscopic Right Hemicolectomy and Morgagni Hernia Repair: An Unusual Presentation of Colon Cancer". Video presentation at the American College of Surgeons Clinical Congress October, 2015.

Abstracts

1. Talia Burneikis, Dom Burneikis, Valery Vilchez, Tony DeRoss, Karen Snyder, Judith French, Stacy Brethauer, Allan Siperstein, Jeremy Lipman "Providing Surgery Residents with Quality Performance Feedback"
2. Ritter, K, Lipman, JM "Efficacy of Self-Directed Surgical Skills Training in Teaching Basic Suturing and Laparoscopic Skills to Medical Students"
   Podium presentation at the Association for Surgical Education, San Antonio, Tx
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Other

1. Lipman, JM "Colorectal Cancer Is on the Rise in Younger Patients" US News and World Report On-Line. Available: https://health.usnews.com/health-care/for-better/articles/2017-10-02/colorectal-cancer-is-on-the-rise-in-younger-patients

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3. Lipman, JM, Steele, S. “Understanding Ulcerative Colitis”. Butts and Guts Podcast. Available: https://my.clevelandclinic.org/podcasts/butts-and-guts/understanding-ulcerative-colitis-with-dr-jeremy-lipman May 12, 2018
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