

Effect of Process Changes in Surgical Training on Quantitative Outcomes From Surgery Residency Programs[☆]



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OBJECTIVES: The purpose of this article is to review the literature on process changes in surgical training programs and to evaluate their effect on the Accreditation Council of Graduate Medical Education (ACGME) Core Competencies, American Board of Surgery In-Training Examination (ABSITE) scores, and American Board of Surgery (ABS) certification.

DESIGN: A literature search was obtained from MEDLINE via PubMed.gov, ScienceDirect.com, Google Scholar on all peer-reviewed studies published since 2003 using the following search queries: surgery residency training, surgical education, competency-based surgical education, ACGME core competencies, ABSITE scores, and ABS pass rate.

RESULTS: Our initial search list included 990 articles on surgery residency training models, 539 on competency-based surgical education, 78 on ABSITE scores, and 33 on ABS pass rate. Overall, 31 articles met inclusion criteria based on their effect on ACGME Core Competencies, ABSITE scores, and ABS certification. Systematic review showed that 5/31, 19/31, and 6/31 articles on process changes in surgical training programs had a positive effect on patient care, medical knowledge, and ABSITE scores, respectively. ABS certification was not analyzed. The other ACGME core competencies were addressed in only 6 studies.

CONCLUSIONS: Several publications on process changes in surgical training programs have shown a positive effect on patient care, medical knowledge, and ABSITE scores. However, the effect on ABS certification, and other quantitative outcomes from residency programs, have not been addressed. Studies on education strategies showing

evidence that residency program objectives are being achieved are still needed.

This article addresses the 6 ACGME Core Competencies. (J Surg Ed 73:807-818. © 2016 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: Accreditation Council of Graduate Medical Education (ACGME), core competencies, American Board of Surgery (ABS), American Board of Surgery In-Training Examination (ABSITE), competency-based surgical education, surgery residency training

COMPETENCIES: Medical Knowledge, Patient Care, Practice-Based Learning and Improvement, Interpersonal and Communication Skills, Professionalism, Systems-Based Practice

INTRODUCTION

On July 1, 1989, 5 years after Libby Zion's death, attributed to errors derived from intern fatigue and inadequate supervision, the 405 Bell Regulations were accepted by the New York legislature, limiting New York State medical residents to 80 hours of work per week, with no more than 24 consecutive hours of work while on call.¹ Nationwide extension of such guidelines occurred on July 1, 2003, when the Accreditation Council of Graduate Medical Education (ACGME) mandated that all U.S. residency programs limit work hours for trainees.² The main rationale for these new accreditation standards was the concern that restricted sleep had a negative effect on performance of physicians in training that compromised patient safety. In July 2011, new Common Program requirements³ took effect, limiting duty periods of interns, or postgraduate year 1 (PGY 1), to a maximum of 16 hours and requiring interns to have direct supervision from a more senior resident or an attending physician at all times. These changes were

[☆]Ethics review: According to the policies of the Institutional Review Board (IRB) at the University of New Mexico, this study does not require IRB review because it does not involve human subjects.

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proposed to improve not only patient safety but also resident education and well-being.

However, since the ACGME work-hour restrictions were introduced in July 2003, several publications^{4,5} have indicated concerns about the possible adverse effects of these restrictions on the quality of education and training of surgical residents, and a potential negative effect on patient care.⁶⁻⁸ Surgery program directors agreed that the ACGME recommendations would likely decrease residents' competency in patient care, medical knowledge, practice-based learning and improvement (PBLI), interpersonal and communication skills, and professionalism.⁹

The aims of this article are to review the available literature on the changing landscape in surgical education since the implementation of work-hour restrictions, to evaluate different training models and strategies that may address specific concerns about the potentially negative effects of work-hour restrictions, and to determine whether these strategies have actually improved the residency training outcomes in an objective manner.

METHODS AND RESULTS

A literature search was obtained from MEDLINE via PubMed.gov, ScienceDirect.com, and Google Scholar on all peer-reviewed studies on surgery residency structural training models published since 2003 using Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines, and the following search queries: surgery residency training, surgical education, competency-based surgical education, ACGME Core Competencies, American Board of

Surgery In-Training Examination (ABSITE) scores, and American Board of Surgery (ABS) pass rate.

Our initial search list included 990 articles on surgery residency structural training models, 539 on competency-based surgical education, 78 on ABSITE scores, and 33 on ABS pass rate. The Figure shows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram demonstrating results of search strategy, and the exclusion criteria. Overall, 31 articles on different structural models for residency training in general surgery and surgical subspecialties met inclusion criteria based on their effect on ACGME Core Competencies, ABSITE scores, and ABS certification (Fig.).

Surgery Residency Structural Training Models

Implementation of an 80-hour workweek forced major changes to graduate medical education, especially surgical education. Creative restructuring of surgical training was imperative to ensure compliance with the ACGME requirements. The ABS Committee on Education and Training proposed revisions to existing training modules. In response to this quandary, the Department of Surgery at Northwestern University's Feinberg School of Medicine^{10,11} proposed 4 basic models that program directors could use to meet the 80-hour regulation. These included the stretch model, the night-float (NF) model, the apprentice model, and the mastery or case-based model. The stretch model, which is the most traditional, consists of taking call every fourth night. The advantages of this model are that it is the easiest to implement and affects faculty the least. Its main disadvantage is the need for increased cross-coverage at

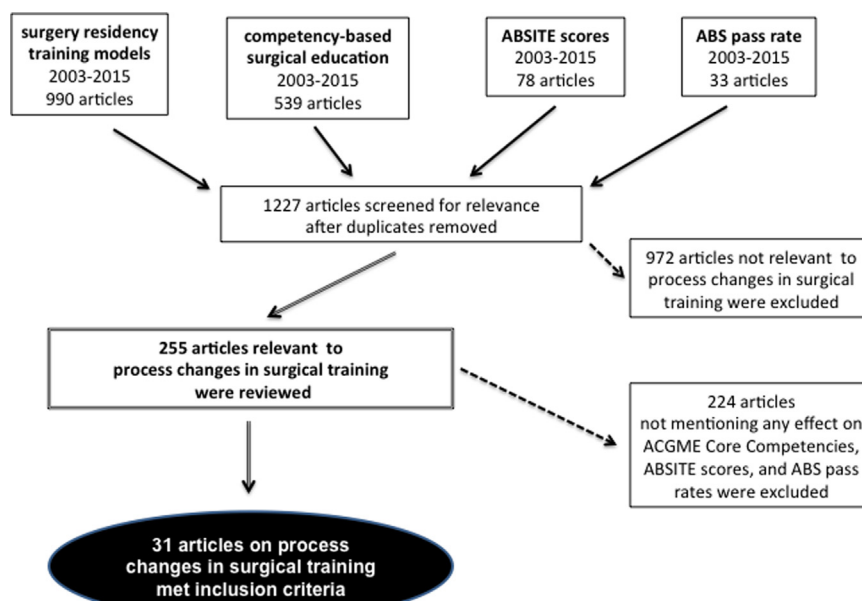


FIGURE. PRISMA flow diagram showing results of search strategy. PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

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