

Minimum Case Numbers: The New Pandemic in a Changing Clinical Environment?

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The COVID-19 pandemic has dramatically altered the clinical arena. While already acclimating to changes regarding telehealth and clinical visits, now is the opportunity to similarly adapt our educational programs. Here we address the assessment of surgical trainee competency in this unpredictable clinical environment.

The Accreditation Council for Graduate Medical Education (ACGME) requires residents from all surgical specialties to reach a minimum number of cases upon graduation.¹⁻⁵ Implementation of these minimum requirements have had varying consequences across different surgical specialties. In orthopedics, a majority of residents are meeting the minimum criteria, though there has been a decrease in the total number of procedures performed by residents.⁶ Conversely, an overall increase in case volume has been described in general surgery, but the variety of cases has narrowed with fewer subspecialty cases being performed.⁷ Obstetrics and gynecology has seen yet another challenge with 50% of graduating residents not meeting the minimum, which is partially due to increased utilization of nonsurgical interventions.⁸ Compounding this change in case volumes is the COVID-19 pandemic. In 2020, elective surgical cases were halted nationally as part of the initial response to the COVID-19 pandemic, and the current surge in hospitalizations related to the Delta and Omicron variants remains an ongoing threat to elective surgical cases. While there is some variability regarding the policies surrounding postponement or cancellation of elective surgeries across the country, surgical case volumes for residents have become unreliable, unpredictable, and often decreased. The active clinical learning necessary for surgeon training is often jeopardized.

The COVID-19 pandemic has brought many previously misunderstood or poorly represented facts to light. While residency program directors are familiar with the role of minimum requirements, they may erroneously view these requirements as the

primary targets for determining competency. Case minimums reflect a program's surgical experiences; however, program directors and faculty must still determine trainee surgical competency. Doing so remains challenging due to the ongoing pandemic and delayed return to surgical volumes. Additionally, the severity of the impact on trainee education likely varies by specialty, with surgical specialties focused on elective procedures being most affected. We can no longer rely solely on our institutions' historical surgical volumes to provide adequate surgical experiences for trainee competency determination. Thus, there is an urgent need to develop strategies for surgical assessment during this unique time.

Competency-based medical education has increasingly gained traction to objectively assess residents. In the United States, the ACGME Milestones assess resident progress across 6 core competency domains throughout residency and are uniquely designed for each specialty.⁹ Despite the standardized assessment, subjectivity remains a challenge. To assist with the determination of competency, many surgical specialties apply the Objective Structured Assessment of Technical Skills (OSATS) framework.¹⁰ The OSATS assessment includes a procedural checklist and a global rating scale of surgical skill (such as tissue handling and use of an assistant). OSATS assessment of core procedures could also be incorporated into the board certification process, with centralized review of a predetermined list of recorded procedures. While OSATS is largely objective, it is imperfect and not without the potential for bias.

In addition to competency assessment, simulation may be used to assess preparation for the limited number of procedures performed during the pandemic. Throughout medicine, many tested low-fidelity models exist for the training of specific tasks that are appropriate for junior residents. A first step toward competency assessment may be demonstrating perfect techniques during simulation before demonstration and assessment on patients. Surgical cases and patient encounters can then focus on the art of surgery and the appropriate application of previously learned

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procedures. Simulation cannot serve as the sole measure of competency, as it does not completely replicate the complexity of patient encounters and real-time problem solving. Even programs with broad evidence of validity, such as the Fundamentals of Laparoscopic Surgery (FLS), are limited in their specialty-specific skill sets. While FLS was initially designed for and broadly relevant to general surgery procedures and principles, it does not adequately address the nuances of other surgical disciplines. Focusing on specialty-specific modules is likely to be more beneficial to surgical trainees

Surgical coaching, distinct from traditional mentorship relationships, is another pathway to assess competency. A coach guides the trainee in self-directed reflection and goal setting rather than simply instructing based on preference or style. Prior studies have demonstrated improved surgical skill competency and self-reflection with the use of coaching programs.¹¹⁻¹³ Coaching emphasizes positive behavior reinforcement via the incorporation of immediate and directive feedback, video debriefing, and behavior modeling.¹¹⁻¹³ Incorporating routine surgical coaching into surgical residency programs requires a shift to a learner-centered teaching philosophy. In our opinion, faculty development focusing on the role and skills of a surgical coach is essential to successful integration.

The above solutions can be adapted to all surgical and procedural programs. However, looking to the future, other potential (and somewhat controversial) options exist to focus surgical training. One commonly discussed long-term global solution is the tracking of residents into integrated surgical residencies. This approach has been successfully accomplished in several surgical subspecialties, such as vascular and plastic surgery.^{14,15} This allows for a comprehensive basic surgical experience combined with a focus on individual specialty interest and may allow a redistribution of surgical case types based on a resident's declared pathway. Other surgical specialties, such as obstetrics and gynecology, may find similar benefits to this approach; the Cleveland Clinic currently utilizes resident tracking through a customizable curriculum.¹⁶

The COVID-19 pandemic has had profound effects on surgical education through reduced numbers of cases, impairing the development of surgical competency as well as competency assessment. Several alternative approaches may enhance preparation for procedures and resident assessment, including planned integration of OSATS and simulation and surgical attending coaching. In addition, consideration of early resident tracking into specialties—and more integrated residencies—may allow targeting of

limited case numbers toward residents planning on specialty careers. These strategies may become even more critical if incoming residents experience continued limited surgical exposures during medical school. The COVID-19 pandemic has magnified the need for thoughtful and deliberate changes to surgical assessment.

References

1. Accreditation Council for Graduate Medical Education. Orthopedic Surgery Minimum Numbers. Accessed November 15, 2021. https://www.acgme.org/Portals/0/PFAssets/ProgramResources/260_ORS_Case_Log_Minimum_Numbers.pdf
2. Accreditation Council for Graduate Medical Education. ACGME Program Requirements for Graduate Medical Education in Vascular Surgery (Integrated). Accessed November 15, 2021. https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/451_VascularSurgeryIntegrated_2020.pdf?ver=2020-06-22-091636-833
3. Accreditation Council for Graduate Medical Education. Case Log Information: Urology. Accessed November 15, 2021. <https://acgme.org/Portals/0/PFAssets/ProgramResources/480-Urology-Case-Log-Info.pdf>
4. Accreditation Council for Graduate Medical Education. Defined Category Minimum Numbers for General Surgery Residents and Credit Role. Accessed November 15, 2021. <https://www.acgme.org/globalassets/DefinedCategoryMinimumNumbersforGeneralSurgeryResidentsandCreditRole.pdf>
5. Accreditation Council for Graduate Medical Education. Case Log Information: Obstetrics and Gynecology. Accessed November 15, 2021. <https://www.acgme.org/Portals/0/PFAssets/ProgramResources/OBGYNCaseLogInfo.pdf?ver=2020-11-20-163905-143>
6. Clark SC, Miskimin C, Mulcahey MK. ACGME case volume minimums decrease the number of shoulder and knee arthroscopies performed by residents. *Arthrosc Sports Med Rehabil*. 2021;3(3):e689–e694.
7. Kearse LE, Zeineddin A, Schmiederer IS, Korndorffer JR Jr, Lau JN. A 20-year review of surgical training case logs: is general surgery still general? *Surgery*. 2021;170(5):1347–1352. doi:10.1016/j.surg.2021.03.062
8. Hall EF, Raker CA, Hampton BS. Variability in gynecologic case volume of obstetrician-gynecologist residents graduating from 2009 to 2017. *Am J Obstet Gynecol*. 2020;222(6):617.e611–617.e618. doi:10.1016/j.ajog.2019.11.1258
9. Accreditation Council for Graduate Medical Education. Milestones. Accessed November 15, 2021. <https://www.acgme.org/what-we-do/accreditation/milestones/overview/>

10. Martin JA, Regehr G, Reznick R, et al. Objective structured assessment of technical skill (OSATS) for surgical residents. *Br J Surg*. 1997;84(2):273–278. doi:10.1046/j.1365-2168.1997.02502.x
11. Bonrath EM, Dedy NJ, Gordon LE, Grantcharov TP. Comprehensive surgical coaching enhances surgical skill in the operating room: a randomized controlled trial. *Ann Surg*. 2015;262(2):205–212. doi:10.1097/SLA.0000000000001214
12. Hu YY, Mazer LM, Yule SJ, et al. Complementing operating room teaching with video-based coaching. *JAMA Surg*. 2017;152(4):318–325. doi:10.1001/jamasurg.2016.4619
13. Mazer LM, Hu YY, Arriaga AF, et al. Evaluating surgical coaching: a mixed methods approach reveals more than surveys alone. *J Surg Educ*. 2018;75(6):1520–1525. doi:10.1016/j.jsurg.2018.03.009
14. Bhadkamkar MA, Luu BC, Davis MJ, et al. Comparing independent and integrated plastic surgery residency models: a review of the literature. *Plast Reconstr Surg Glob Open*. 2020;8(7):e2897. doi:10.1097/GOX.0000000000002897
15. Tanious A. Traditional (5+2) versus integrated (0-5) vascular surgery training: the effect on case volume and the trainees produced. *Semin Vasc Surg*. 2019;32(1-2):27–29. doi:10.1053/j.semvascsurg.2019.05.004
16. Reed VR, Emery J, Farrell RM, Jelovsek JE. Tracking—a flexible obstetrics and gynecology residency curriculum. *Obstet Gynecol*. 2019;134(suppl 1):29–33. doi:10.1097/AOG.0000000000003464



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