

Slower but safe? Resident involvement in urological surgeries

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Academic urologists have dual roles. We are required to educate residents while simultaneously providing excellent surgical care. This is of course done in a publicly funded healthcare system, where efficiency and fiscal responsibility is also necessary. All things considered, it seems very relevant to ask the question, “What is the effect of resident involvement on surgical times, costs, and outcomes?” The manuscript by Welk et al assesses the effect of an academic environment on operative times in a cohort of 114 225 patients undergoing five urological procedures in Ontario.¹ In a multivariate model, even when accounting for referral bias and patient comorbidity, all five procedures took significantly longer in academic hospitals when compared to non-teaching centres. Operative time increased by 10–21% and likely resulted in an estimated additional cost of \$4.25 million dollars over the 11-year study period.

This manuscript provides a valuable bird’s-eye view of operative times in a Canadian academic environment. This study is not without limitation, however. There may be an underlying assumption that a resident is present in every operating room in every hospital with an academic affiliation. This may not always be true. Also, the degree to which residents participated in cases is also unknown. Resident involvement can vary from observing and retracting to performing the entirety of the procedure. Without knowing how much involvement residents had, it may be erroneous to generalize the effect of resident involvement on operative time. Thirdly, resident involvement in surgery may not always prolong operative time. A recent study of resident involvement in urethroplasties found increased operative times for chief resident cases, but no effect of junior residents, suggesting lesser involvement of junior residents in these more specialized operations.²

Despite the limitations, this study is quite valuable and bears striking resemblance to the existing literature examining urology resident involvement and operative times. The

majority of the existing literature is based on data from the National Surgical Quality Improvement Program (NSQIP) in the U.S. These studies consistently show that the involvement of a resident prolongs operative time. In general, urological procedures increase from a mean of 98 minutes to 159 minutes when residents are involved.³ This is apparent for virtually all urological surgeries, including radical prostatectomy, minimally invasive oncology, nephrectomy (partial and radical), transurethral surgery (TURP and TURBT), and urethroplasty.^{2,4-7} Without a doubt, resident participation consistently prolongs operative time and it is likely that these increased costs are an unavoidable consequence of resident training.

Clearly resident involvement increases operative time, but what effect does this have on surgical outcomes? In the (non-urological) surgical literature, some studies have demonstrated an increased risk of postoperative complications, including surgical site infection, sepsis, urinary tract infection, pulmonary complications, and thromboembolism.⁸ In the urological literature, there is no consistent association between resident participation and postoperative complications, with no identifiable difference in outcomes for “general urology” procedures, robot-assisted radical prostatectomy, and urethroplasty.²⁻⁴ However, there may be an increased risk of postoperative complications for both open and minimally invasive nephrectomy (partial and radical), as well as an increase in 30-day readmission rates for transurethral procedures.^{6,7,9} Surgical site infections appear to be the most consistent complication arising during resident involvement, which makes sense given the well-documented association of infectious complications and increasing operative time.¹⁰

On balance, it appears that staff surgeons operate faster without residents, but the impact on postoperative complications is variable, and in most instances is likely not clinically significant. Prolonged operative time and associated costs are likely a necessary consequence of resident teaching. This should not result in restrictions in resident surgical involvement, but rather act as impetus to develop novel methods of surgical training, adopt surgical simulation, and perhaps increase funding to select teaching sites with a high-density of learners. The correct balance of autonomy and supervi-

sion in residency training is vital to ensure excellent patient care while fostering an effective teaching environment.

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References

1. Welk B, Winick-Ng J, McClure A, et al. The impact of teaching on the duration of common urological operations. *Can Urol Assoc J* 2016;10:172-8. <http://dx.doi.org/10.5489/cuaj.3737>
2. Meyer CP, Hanske J, Friedlander DF, et al. The impact of resident involvement in male one-stage anterior urethroplasties. *Urology* 2015;85:937-41. <http://dx.doi.org/10.1016/j.urolgy.2015.01.010>
3. Matulewicz RS, Pilecki M, Rambachan A, et al. Impact of resident involvement on urological surgery outcomes: An analysis of 40 000 patients from the ACS NSQIP database. *J Urol* 2014;192:885-90. <http://dx.doi.org/10.1016/j.juro.2014.03.096>
4. Lee Z, Lightfoot AJ, Mucksavage P, et al. Can robot-assisted radical prostatectomy be taught to chief residents and fellows without affecting operative outcomes? *Prostate Int* 2015;3:47-50. <http://dx.doi.org/10.1016/j.pmil.2015.03.005>
5. Ruhotina N, Dagenais J, Gandaglia G, et al. The impact of resident involvement in minimally-invasive urologic oncology procedures. *Can Urol Assoc J* 2014;8:334-40. <http://dx.doi.org/10.5489/cuaj.2170>
6. Kern SQ, Lustik MB, McMann LP, et al. Comparison of outcomes after minimally invasive versus open partial nephrectomy with respect to trainee involvement utilizing the American College of Surgeons National Surgical Quality Improvement Program. *J Endourol* 2014;28:40-7. <http://dx.doi.org/10.1089/end.2013.0051>
7. Allard CB, Meyer CP, Gandaglia G, et al. The effect of resident involvement on perioperative outcomes in transurethral urologic surgeries. *J Surg Educ* 2015;72: 1018-25. <http://dx.doi.org/10.1016/j.jsurg.2015.04.012>
8. Raval MV, Wang X, Cohen ME, et al. The influence of resident involvement on surgical outcomes. *J Am Coll Surg* 2011;212:889-98. <http://dx.doi.org/10.1016/j.jamcollsurg.2010.12.029>
9. Liu JJ, Leppert JT, Maxwell BG, et al. Trends and perioperative outcomes for laparoscopic and robotic nephrectomy using the National Surgical Quality Improvement Program (NSQIP) database. *Urol Oncol* 2014;32:473-9. <http://dx.doi.org/10.1016/j.urolonc.2013.09.012>
10. Leong G, Wilson J, Charlett A. Duration of operation as a risk factor for surgical site infection: Comparison of English and US data. *J Hosp Infect* 2006;63:255-62. <http://dx.doi.org/10.1016/j.jhin.2006.02.007>

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