Urology residents on call: Investigating the workload and relevance of calls

Benoît Thériault, Maryse Marceau-Grimard, Anne-Sophie Blais, Vincent Fradet, Katherine Moore, Jonathan Cloutier
Division of Urology, Department of Surgery, CHU de Québec-Université Laval, Québec, QC, Canada

Acknowledgement: *The authors thank all the residents who participated in this study from Université Laval's Urology residency training program. Without them, this study would not have been possible.*

Cite as: *Can Urol Assoc J* 2017 Dec. 1; Epub ahead of print**.** http://dx.doi.org/10.5489/cuaj.4333

Published online December 1, 2017

****

Abstract

Introduction: On-call medical services assumed by residents represent many hours of hard work and no studies have documented what it really is. As part of an effort to ameliorate our on-call system, we examined phone calls received by residents on call. Our objectives were to evaluate the characteristics of phone calls received by residents on call (who, when, why, need to go to the hospital) and to determine residents' perception of these calls. We also looked into implementing strategies to reduce unnecessary calls.
Method: We prospectively collected information about calls using a standardized reporting form with the participation of all residents (10) from a single urology program over two periods of four weeks from November 2014 to March 2015. Residents answered pre- and post-collecting period questionnaires.
Results: A total of 460 calls were recorded on 97 on-call days in two on-call lists. There was a mean (median, range) of 3.5 (3, 0–12) calls per weeknight and 7.7 (6, 0–23) calls per weekend full day. Nintey-three calls (20%) led to the need for bedside evaluation and many of these were for new consultation (49%). The majority of calls originated from the clinical in-patient ward (49%) and emergency room (29%), and nurses (66%) and doctors (23%) most commonly initiated the calls. Calls between 11:00 pm and 8:00 am represented 13% of all calls. Most of the calls (77%) were perceived as relevant or very relevant. Most residents reported at least 80% of calls.
Conclusions: Although likely representing an underestimate of the reality, we provide a first effort in documenting the call burden of Canadian urology residents.

Introduction

There is a recent and rapidly growing interest given to residents' workload with the implementation of new working hours regulations.[1-14] Canada does not have uniform, pan-Canadian legislation governing aspects of the working environment for residents. In most provinces, there is a limit of 24 hours for a single call shift. In June 2013, Canada's National Steering Committee on Resident Duty Hours released its recommendations for a nationwide approach to resident duty hour reform and concluded that the status quo of 24 or more hours without restorative sleep should be avoided.[15] In the province of Quebec, resident duty hours had been reduced to a 16 hours maximum in house call in July 2012 due to a 2011 arbitration ruling stating that a 24-hour duty period is a violation of the Canadian Charter of Rights and Freedoms and the Québec Charter of Human Rights and Freedoms.[16] According to the 2010-2015 Fédération des Médecins Résidents du Québec (FMRQ) collective agreement, when call duty is carried out from home, there is a maximum of nine call periods each month. Also, if the resident is performing call duty at home and has worked for 18 hours during a 24-hour period, he shall be released from his regular schedule following his call period for at least 24 hours, and shall not work more than 24 hours in a row.[17] On-call medical services assumed by urology residents represent a significant work burden. Yet, we found no study documenting it. We found only few studies about pathology, plastic surgery and otolaryngology residents evaluating the in-home on-call workload.[18,19,20] As part of an effort to improve our on call system, we examined phone calls received by residents. We sought to evaluate the characteristics of phone calls received and to determine residents' perception of these calls. Our objectives were to document nature, number and characteristics of calls received by urology residents and to find clues to how limit unnecessary calls.

Methods

From November 2014 to March 2015, information from phone calls received during on-call service was prospectively collected. All residents (10) from a single urology program from post graduate year (PGY) 1 to 5 participated to the project. Data were collected over 2 selected periods of 4 weeks. Residents answered pre- and post- study period questionnaires. On call service is organised based on an "at home" protocol. Often, the residents have to return to the hospital for bedside evaluation, if judged clinically required. During a weekday, the reception of calls for the on call service begins at 5:00 PM until 8:00 AM; during the weekend, a complete 24h call service scheme is used. All calls concerning urology are received primarily by the urology resident. There were no in house on-call resident during the period of the study. There are two separate on-call lists covering different centers, each one specializing in different fields of urology. The pediatric center was not recorded in this study. On the first list, there are two covered centers. The first center, is a Level 1 trauma center, has over sixty stretchers in the emergency room (ER) and has over 500 beds.[21,22] The other center of this list, is the reference center for urinary lithiasis, has also over sixty

stretchers in the ER and over 250 beds.[22] A total of eight different urologists are working in these two centers. The second list covers only one hospital, a 250-beds cancer center and has a dedicated urology floor where there is an average of 20 to 25 in-house patients. Seven urologists are working on this site. For the year 2015, over 400 radical prostatectomies and 70 radical cystectomies have been performed.[23] In 2014, nearly 7000 procedures in adult urology are performed in these three different hospitals.[22]

We used an *a priori* defined standardized data collection form. Resident were instructed to record on the form: the caller, where the call originate, the purpose of the call, the time they received the call, the need for bedside evaluation and their perception of the relevance of the call.

To evaluate call relevance, we used a Likert scale (1=very relevant, 2=relevant, 3=no opinion, 4=irrelevant, 5=very irrelevant) applied to each call received and graded by the resident. We compared call relevance between sites, between residency levels and whether or not there was a need for bedside evaluation by using the Wilcoxon rank-sum test statistic and Mann-Whitney test. P value ≤ 0.05 were considered statistically significant with a two-tailed probability.

Results

A total of 460 calls were collected from 97 on call days (69 week nights and 28 weekend full days). Of all the calls, 93 (20%) led to the need for real time urological evaluation, including the need to return to the hospital. Of these, 46 (49%) were for new consultations or new admissions, 26 (28%) led to the need for bedside evaluation of in-house patients, and 20 (22%) were calls from the operating room to warn about an imminent surgery (figure 1). Junior residents seemed to be more prone to choose a bedside evaluation (27% of junior residents calls versus 18% for senior residents calls p=0.036). Sixty calls (13%) were received between 11:00 PM and 8:00 AM. The distribution of calls received is as depicted in Table 1 with an average of 3.5 calls received per week night and 7.9 per weekend day with a range from 0 to 12 and from 0 to 23 respectively. Most calls came from nurses and doctors, originate from clinical floors and the emergency room (ER) (Figure 2 and 3).

Another element documented for each call was the perceived relevance of the call by the resident (Figure 4). The main purpose of the calls was for the notification of patient status (32%) and it was also the most common cause of irrelevant calls (33%). The other frequent purposes of calls were for consultation (17%), prescription clarification (15%) and opinion asked for a patient care from another doctor (14%). The remaining calls include notification of upcoming surgery (5%), notification of laboratory or radiology result (4%) and others (13%). The other irrelevant calls were about prescription clarification (24%) consultation (13%) and opinion asked for a patient care from another doctor (10%).

Using pre- collecting period questionnaires and calls information, the residents estimated at 85% the global relevance of calls. Most calls (77%) where considered as very

relevant or relevant (84% for site 1 and 76% for site 2). We then used the averaged answers from the pre- and post- study questionnaires. There was no difference in the perceived relevance of calls for each site (Likert scale average 2.0 vs 2.2; P=0.17) and for residency levels.

After each study period, residents were asked on the post study period questionnaire to evaluate their performance in documenting all calls. The majority (60%) of resident-period answers described that over 95% of calls received during the study period were documented using the study collection forms and nearly all (87%) of residents-period answers described that a greater than 80% of calls were documented.

Discussion

This is the first study taking into account only calls' parameter during resident's at home on call duty in a Canadian urology residency program. So this study, despite not being perfect, represents the only data to rely on.

Acknowledging that the perceived relevance of calls is a very subjective information, we still took the opportunity for this study to look into this aspect to validate if actions could be taken to limit the number of calls received. A particular interest for residents doing the study was to reveal if a difference could be demonstrated in the relevance of calls between site 1 and 2. The subjective perceived difference before the study was conducted in the relevance of calls between the two sites noted by residents could not be observed in this study. Although these findings would benefit from validation, they certainly underscore the importance of objectively documenting such perceptions before making any conclusions of changes in residency programs.

Recurrent reasons for less relevant calls were discussed between the residents to try to reduce them. Most calls for clarifications of prescriptions were from nurses asking us to confirm that the prescription is to be followed as written. Educating nurses could surely play a key role in reducing those irrelevant calls. Also, most calls about consultations judged as irrelevant were clinical scenarios described in the reference algorithms available in our center. Such algorithms, available in ER, covers different pathology like gross hematuria, renal colic and scrotal pain for example. Educating ER doctors could also help to reduce those calls perceived as irrelevant. We couldn't find significant differences of relevance by residency level likely because of the small sub-sample size available for each residency level. The results of this study correlate with those of a recent study investigating residents' home-call experience of an Otolaryngology-Head and Neck Surgery program. Although it is a different surgical specialty from urology, one can notice that the results are similar while the study also showed that the majority (78.5%) of calls received by residents during their at home on-call duty were considered non-urgent.[20]

Urology training programs in Canada share certain degree of similarity due to its regulation and relative uniformity in health care system. Therefore, the findings in our study

is probably a good representation of the on call burden for residents in Canada, and if not in all Canada, at least in the province of Quebec.

Some limitations of our study are worth mention. First, not all calls were documented, however an important majority of them seem to have been collected (Figure 5). Relying on telephone operator data to compare the accuracy of calls documented would have been an interesting alternative. In our environment, this could not be used since an important portion of calls was directly dialled by certain units, such as the emergency department. Most calls came from clinical floors. During the collecting period, admissions were limited on the surgical ward because of an overload of in-patients and elective surgeries had to be postponed. This could have reduced the number of potential calls for admission. Finally, residents in our program only take calls referring to patients physically in the hospital because of insurance covering concerns, a situation that can make this study less representative of other residency programs taking calls from patients, nurse and doctors from outside-hospital clinical settings. We believe it is important to point out that the number of calls is not a perfect way to represent the workload of residents; if a resident is already in the hospital, he is less likely to receive a call because the nurses and doctors can interact with him directly. Taking all those aspects into consideration, we consider that the numbers obtained in our study represent the minimum number of calls received by residents during an on call day. Our findings represent an underestimate of reality, but the only data currently available.

Although some have reported that numbers of hours worked by residents have not shown impact on surgical patient outcome, it would be interesting to explore about how many hours residents are occupied during their on-call service, and how these call night affect the resident's sleep, and their performance the following day.[24-28] In the same context, a recent study has shown that postcall-related fatigue was associated with decreased surgical skills in the operative room.[29] More, as described earlier, if the resident is performing call duty at home and has worked for 18 hours during a 24-hour period, he shall be released from his regular schedule following his call period for at least 24 hours, it could be relevant to examine how often these situations happened. On-call duty service provides high impact learning opportunities, but loses some of his pedagogical benefits if the resident is subsequently absent of the clinical activities.[17] Recently, in CHU de Québec-Université Laval, a "night float" system have been put in place. Under the float system, junior residents on-call works 12 hours night shifts (8pm to 8am), from Monday to Thursday. They are from every specialties and received calls for every in-patient. It will be interesting to see how this new system affects the workload for residents performing call duty at home.

Conclusion

Most calls received by residents on call in our program are from nurses and doctors working on the clinical floor and the ER. An average of 3.5 calls per week night and 7.9 calls per

weekend day are received and most of them (77%) are perceived as relevant. However, room for improvement remains and education is probably the key. The results of this study provide us an overall picture of the calls received by the residents and also a sample of residents workload during the on-call service. Further work in this area is needed and justified as it could improve the resident's workload.

References

1. Wallack MK, Chao L. Resident work hours: the evolution of a revolution. *Arch Surg* 2001; 136(12): 1426-31.
2. Tan P, Hogle NJ, Widmann WD. Limiting PGY 1 residents to 16 jours of duty: review and report of a workshop. *J Surg Educ* 2012; 69(3); 355-9.
3. Carlin AM, Gasevic E, Shepard AD. Effect of the 80-hour work week on resident operative experience in general surgery. *Am J Surg*, 193 (2007), pp. 326–30
4. McElearney ST, Saalwachter AR, Hedrick TL et al. Effect of the 80-hour work week on cases performed by general surgery residents. *Am J Surg* 71 (2005), pp. 552–6
5. Damadi A, Davis AT, Saxe A et al. ACGME duty-hour restrictions decrease resident operative volume: a 5-year comparison at an ACGME-accredited university general surgery residency. *J Surg Educ*,64 (2007), pp. 256–9
6. Feanny MA, Scott BG, Mattox KL, et al. Impact of the 80-hour work week on resident emergency operative experience. *Am J Surg* 190 (2005), pp. 947–9
7. Green SA, Poole GD. Resident work hours: examining attitudes toward work-hour limits in general surgery, orthopaedics, and internal medicine. *BC Med J* 52 (2) (2010), pp. 84–8
8. Maruscak AA, VanderBeek L, Ott MC, et al. Implications of current resident work-hour guidelines on the future practice of surgery in Canada. *J Surg Educ* 69 (4) (2012), pp. 487–92
9. Antiel RM, Thompson SM, Hafferty FW, et al. Duty hour recommendations and implications for meeting the ACGME core competencies: views of residency directors. *Mayo Clin Proc* 86 (3) (2011), pp. 185–91
10. Lachance S. Latulippe J-F, Valiquette L, et al. Perceived effects of the 16-hour workday restriction on surgical specialties: Quebec's experience. *J Surg Educ* 71 (5) (2014), pp. 707–15
11. Jamal MH, Rousseau MC, Hanna WC, et al. Effect of the ACGME duty hours restrictions on residents and faculty: a systematic review. Acad Med, 86 (1) (2011), pp. 34–42
12. Ahmed N, Devitt KS, Keshit I, et al. A systematic review of the effects of resident duty hour restrictions in surgery. Ann Surg, 259 (6) (2014), pp. 1041–53
13. Kort KC, Pavone LA, Jensen E, et al. Resident perceptions of the impact of work-hour restrictions on health care delivery and surgical education: time for transformational change. *Surgery*, 136 (4) (2004), pp. 861–71
14. Stamp T, Termuhlen P, Miller S, et al. Before and after resident work hour limitations: an objective assessment of the well-being of surgical residents. *Curr Surg* 62 (2005), pp. 117–21

15. Jason R. Frank JR, Imrie K; for Fatigue, Risk, & Excellence: Towards a Pan-Canadian Consensus on Resident Duty Hours, National Steering Comittee on Resident Duty Hours, June 2013, http://www.residentdutyhours.ca/documents/fatigue_risk_and_excellence.pdf
16. FMRQ. 16-hour call duty: Arbitrator rules in FMRQ's favour. 2011, Available from: http://www.fmrq.qc.ca/formationmedicale/actualitesDetails_ang.cfm?noActualite=199
17. FMRQ. Interpretation Guide, collective agreement 2010-2015, 2011, p.27-36, Available from: http://www.fmrq.qc.ca/files/documents/e2/17/2013-03-19-fmrq-guide-interpretation-de-l-entente-2010-2015-va-finale-modifi-e.pdf
18. Drolet BC, Prsic A. Schmidt ST. Duty hours and home call: the experience of plastic surgery residents and fellows. *Plast Reconstr Surg* 2014;133:1295–302.
19. Do MC, Ben-Ezra J, McPherson RA. Call subject patterns among on-call clinical pathology residents in an academic institution: how wan tracking changes in patterns over time benefit resident education? *Arc Pathol Lab Med* 2008; 132(8): 1317-20.
20. Caulley L, Quimby AE, Barrowman N, et al. Effect of Home-Call on Otolaryngology Resident Education: A Pilot Study. *J Surg Educ* 2016 Oct 4. S1931-7204
21. Rapport annuel de gestion 2014-2015, CHU de Québec, Juin 2015, 65-70.
22. Hameed SM & Al., Access to Trauma System in Canada, *Journal of trauma* 2010 ;69; 1350-61.
23. Archives médicales CHU de Québec, 2015.
24. Ulmer C, Miller D, Wolman M.M.E. Johns (Eds.), Resident Duty Hours: Enhancing Sleep, Supervision, Safety. Institute of Medicine, National Academies Press, Washington, DC (2008).
25. Volpp KG, Rosen AK, Rosenbaum PR, et al., Mortality among patients in VA hospitals in the first 2 years following ACGME resident duty hour reform. *JAMA* 298 (2007), pp. 984–92.
26. Meltzer DO, Arora VM. Evaluating resident duty hour reforms: more work to do. *JAMA* 298 (2007), pp. 1055–7.
27. Ahmed N, Devitt KS, Keshet I, et al. A systematic review of the effects of resident duty hour restrictions in surgery: impact on resident wellness, training, and patient outcomes. *Ann Surg* 2014;259(6):1041-53.
28. Rajaram R, Chung JW, Jones AT, et al. Association of the 2011 ACGME resident duty hour reform with general surgery patient outcomes and with resident examination performance. *JAMA* 2014;312(22):2374-84
29. Yamany T, Woldu SL, Korets R, et al. Effect of postcall fatigue on surgical skills measured by a robotic simulator. *J Endourol* 2015 Apr;29(4):479-84

Figures and Tables

Fig. 1. Breakdown of calls that require in-house evaluation or intervention. OR: operating room.

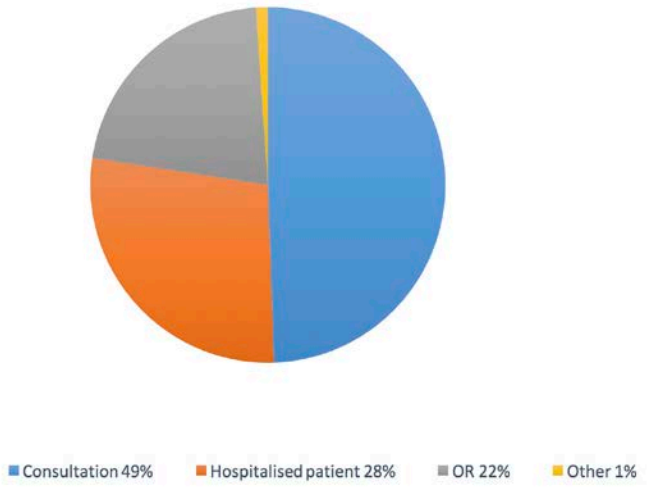

Fig. 2. Breakdown of who initiates urology resident calls.

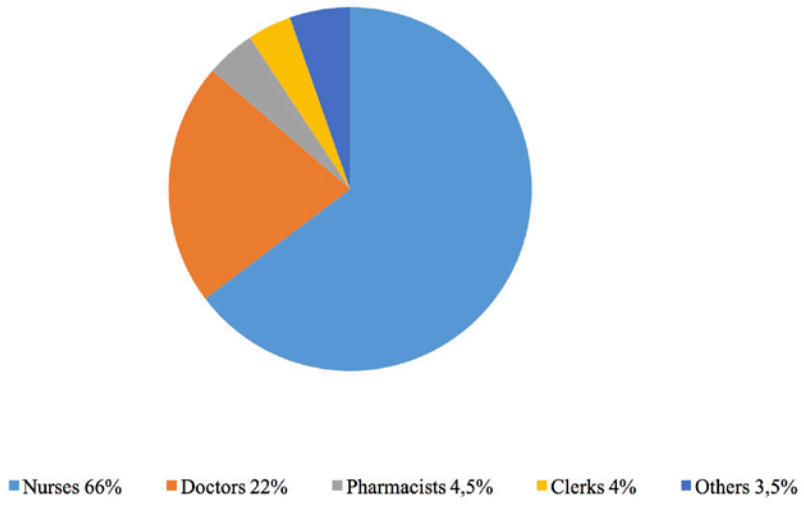

Fig. 3. Breakdown of where urology resident calls originate. ER: emergency room; OR: operating room.

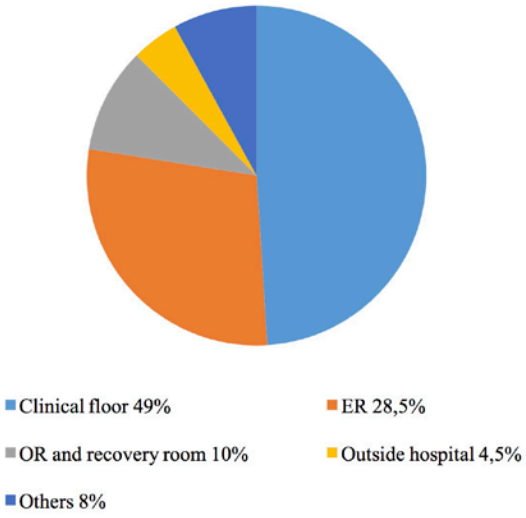

Fig. 4. Breakdown of the pertinence of calls.

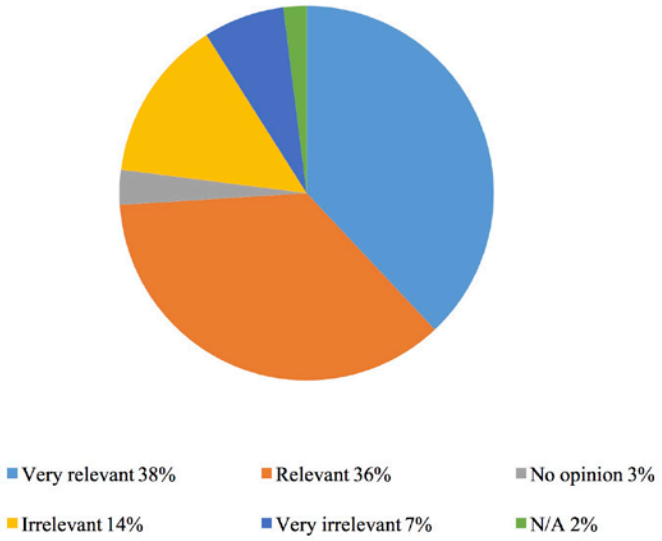

Fig. 5. Estimated % of calls documented.

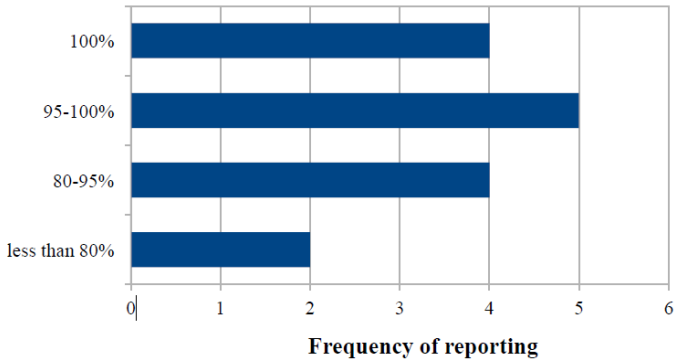

Table 1. Number of calls per day		
Number of calls per on call day		
Moment	**Average (median)**	**Range**
Week night (15h)		
Global	3.5 (3)	0–12
Site 1	2.5 (2)	0–12
Site 2	4.5 (4)	0–8
Weekend day (24h)		
Global	7.9 (6)	0–23
Site 1	6 (6)	3–10
Site 2	9.3 (8)	0–23