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

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Cite as: *Can Urol Assoc J* 2018;12(2):E71-5. 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 entails. As part of an effort to improve 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.
Methods: 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 of 3.5 (median 3, range 0–12) calls per weeknight and 7.7 (median 6, range 0–23) calls per weekend full day. Ninety-three calls (20%) led to the need for bedside evaluation and many of these were for new consultations (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

With the implementation of new working hour regulations, there is a rapidly growing interest in resident workload.[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 Quebec, resident duty hours had been reduced to a 16-hour 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 on-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 this. We found only few studies about pathology, plastic surgery, and otolaryngology residents evaluating the in-home, on-call workload.[18-20] 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 the nature, number, and characteristics of calls received by urology residents and to identify ways to 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 postgraduate year (PGY) 1–5 participated to the project. Data were collected over two selected periods of four weeks. Residents answered pre- and post-study per-

iod questionnaires. On-call service is organized based on an "at-home" protocol. Often, the residents have to return to the hospital for bedside evaluation, if judged clinically necessary. 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 24-hour call service scheme is used. All calls concerning urology are received primarily by the urology resident. There were no in-house, on-call residents during the study period.

There are two separate on-call lists covering different centres, each one specializing in different fields of urology. The pediatric centre was not recorded in this study. On the first list, there are two covered centres. The first, a Level 1 trauma centre, has over 60 stretchers in the emergency room (ER) and has over 500 beds.[21,22] The other centre, the reference centre for urinary lithiasis, has also over 60 stretchers in the ER and over 250 beds.[22] A total of eight different urologists work in these two centers. The second list covers only one hospital, a 250-bed cancer centre, and has a dedicated urology floor where there is an average of 20–25 in-house patients. Seven urologists work on this site. In 2015, over 400 radical prostatectomies and 70 radical cystectomies were performed.[23] In 2014, nearly 7000 procedures in adult urology were performed in these three different hospitals.[22]

We used an *a priori* defined standardized data collection form. Resident were instructed to record: the caller, where the call originated, 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 as graded by the resident. We compared call relevance between sites, between residency levels, and determined whether or not there was a need for bedside evaluation by using the Wilcoxon rank-sum test statistic and Mann-Whitney test. P≤0.05 was 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 (Fig. 1). Junior residents seemed to be more prone to choose a bedside evaluation (27% of junior residents calls vs. 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 depicted in Table 1, with an average of 3.5 calls received per week night and 7.9 per weekend day (range of 0–12 and 0–23, respectively). Most calls came from nurses and doctors and originated from clinical floors and the ER (Figs. 2, 3).

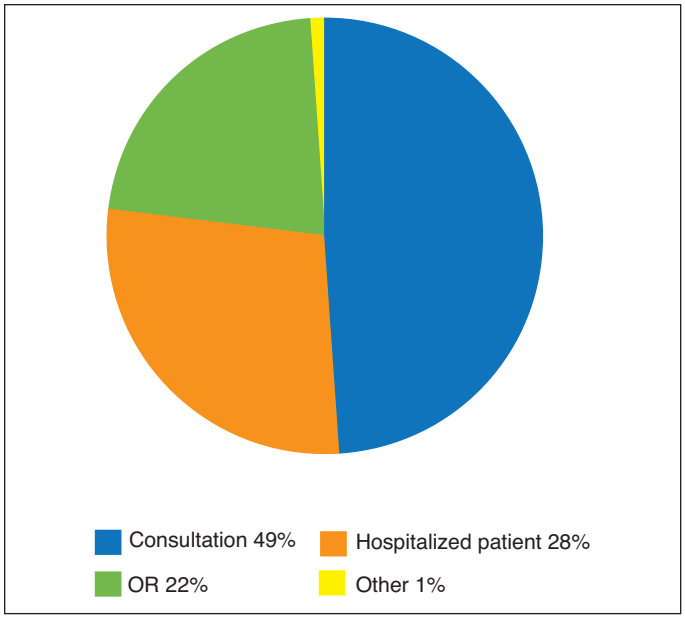

Fig. 1. Breakdown of calls that require in-house evaluation or intervention. OR: operating room.

Another element documented for each call was the perceived relevance of the call by the resident (Fig. 4). The main purpose of the calls was for the notification of patient status (32%), and this 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 included notification of upcoming surgery (5%), notification of laboratory or radiology result (4%), and other (13%). The other irrelevant calls were about prescription clarification (24%), consultation (13%), and opinion asked for patient care from another doctor (10%).

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

Table 1. Number of calls per day

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

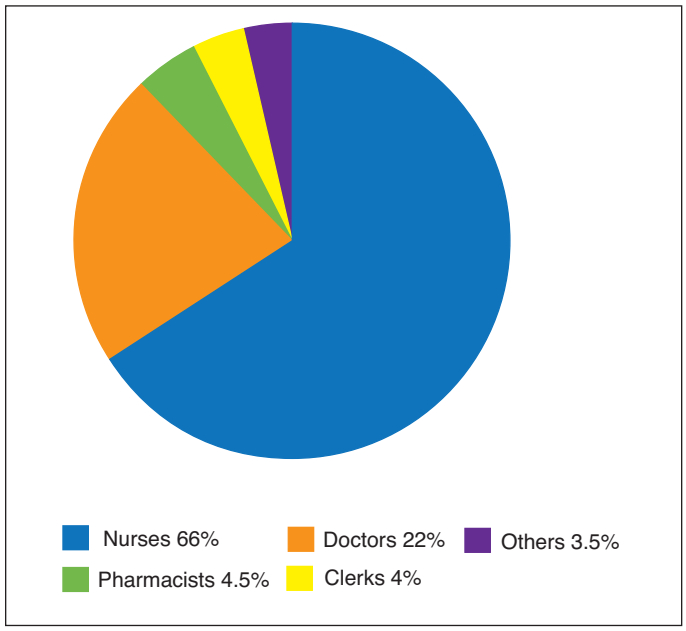

Fig. 2. Breakdown of who initiates urology resident calls.

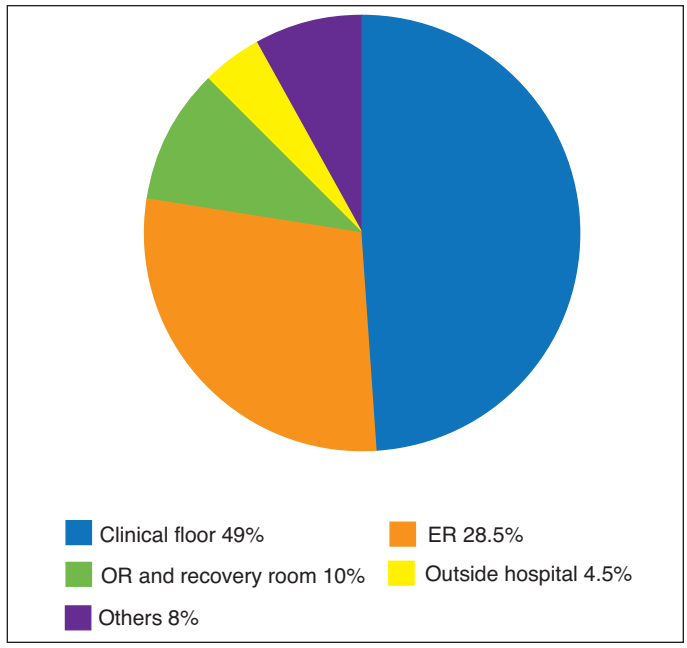

Fig. 3. Breakdown of where urology resident calls originate. ER: emergency room; OR: operating room.

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 by site (Likert scale average 2.0 vs 2.2; p=0.17) or by residency level.

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

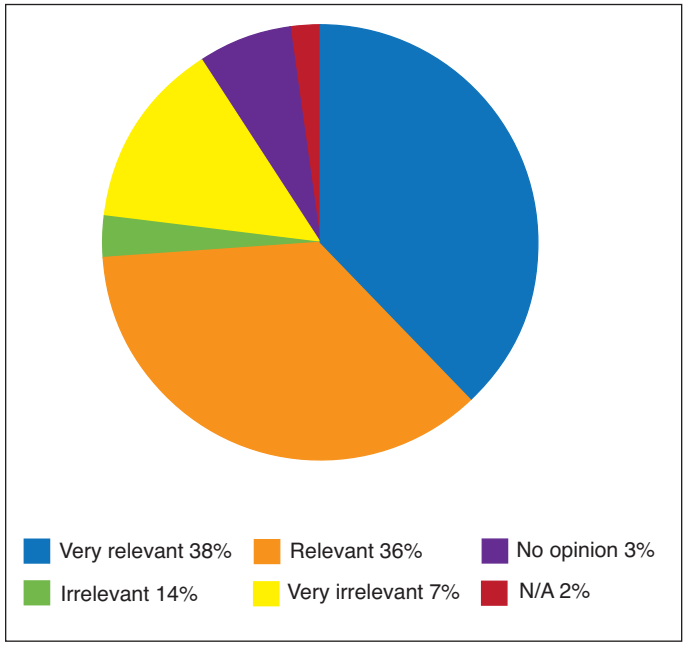

Fig. 4. Breakdown of the pertinence of calls.

Discussion

This is the first study taking into account only call parameters during residents' at-home, on-call duty in a Canadian urology residency program. Therefore, despite some limitations, this study represents the only data available to date.

Acknowledging that the perceived relevance of calls is very subjective, we still took the opportunity to look into this aspect to validate if actions could be taken to limit the number of calls received. A particular interest for residents participating in the study was to identify any differences in the relevance of calls between site 1 and 2. The perceived

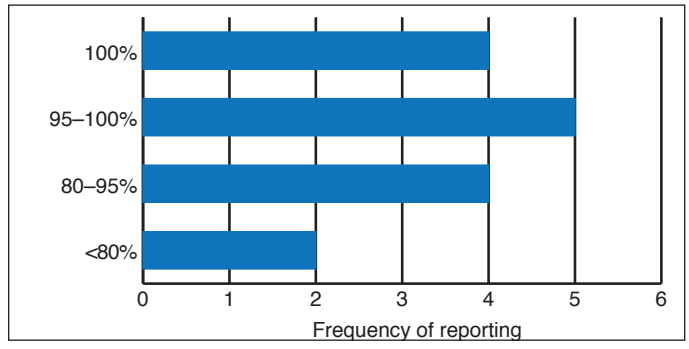

Fig. 5. Estimated % of calls documented.

difference in the relevance of calls between the two sites noted by residents could not be confirmed in this study. Although these findings would benefit from validation, they certainly underscore the importance of objectively documenting such perceptions before making any conclusions with regard to 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 to confirm that a prescription was to be followed as written. Educating nurses could play a key role in reducing these types of calls. Also, most calls about consultations judged as irrelevant were clinical scenarios described in the reference algorithms available at our centre. Such algorithms, available in ER, cover different pathologies, such as 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, the results are similar; that 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 a certain degree of similarity due to regulations and the relative uniformity of the healthcare system. Therefore, the findings of our study are probably a good representation of the on-call burden for residents throughout Canada.

The study does have some limitations. First, not all calls were documented; however, an important majority of them seem to have been collected (Fig. 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 undertaken since a significant portion of calls were directly dialled by certain units, such as the ER.

Most calls came from clinical floors. During the collecting period, admissions were limited on the surgical ward because of an overload of in-patients. Many elective surgeries had to be postponed. This could have reduced the number of potential calls for admission.

Finally due to insurance coverage concerns, residents in our program only take calls referring to patients physically in the hospital, a situation that can make this study less representative of other residency programs taking calls from patients, nurse, and doctors from out-of-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 are 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 how many hours residents are occupied during their on-call service, and how these call nights affect the residents' sleep and performance the following day.[24-28] A recent study has shown that post-call-related fatigue was associated with decreased surgical skills in the operating room.[29] Moreover, as described earlier, in Quebec if the resident is performing call duty at home and has worked for 18 hours during a 24-hour period, he is released from his regular schedule following his call period for at least 24 hours; it could be relevant to examine how often this situation occurs. On-call service provides a high-impact learning opportunity, but the residents loses some of the pedagogical benefits if they are subsequently absent of clinical activities following the on-call period.[17]

Recently, in CHU de Québec-Université Laval, a "night float" system has been put in place. Under the float system, junior residents who are on call work 12- hour night shifts (8:00 pm to 8:00 am) from Monday to Thursday. They are from every specialty and receive calls for every in-house 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. There is room for improvement, however, and education is likely the key. The results of this study provide 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 workload.

Competing interests: The authors report no competing personal or financial interests related to this work.

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

This paper has been peer-reviewed.

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