

**IMPACT OF A NEWLY INTRODUCED MEDICAL OFFICER NIGHT-FLOAT ON-CALL SYSTEM IN A MEDICAL DEPARTMENT IN SINGAPORE**

Dear Sir,

Being a former colony of the United Kingdom (UK) prior to independence in 1965, Singapore's medical system was based largely on the British healthcare model. Over the past 40 years, medical care has progressed in tandem with the rise in our nation's economy and standard of living. Although our healthcare system has evolved, some aspects of the system have changed little during this time. One of these is the junior doctors' on-call system in providing after-hours clinical services in major acute care hospitals. Medical officers (MOs) in Singapore are the equivalent of residents in the United States (US) and senior house officers in the UK.

In all public acute care hospitals, on-call MOs in medical departments start their calls after a normal workday. This continues overnight until the next working day where they will work till midday before going off-duty. By that time, these MOs would have worked for a continuous stretch of 30 hours. MOs who are on-call during weekends also work from morning till the next day. We wish to report the rationale and process of a recent transition from the traditional MO on-call system to a night-float system in our hospital.

Our hospital is a 997-bed tertiary acute hospital and the Department of Medicine has an average of 240 inpatients under various medical subspecialties (excluding Cardiology and Haematology-Oncology). Under the traditional on-call system, our MOs are on-call about six times a month. During these calls, the MOs attend to new admissions as well as provide coverage to inpatients.

At the beginning of 2007, in response to the feedback from MOs regarding the increasingly heavy night-call workload, a review of the night-call system was carried out. Issues reviewed included on-call duration, the number of MOs on-call per night, distribution of wards between on-call MOs and proper handing over of patient care between day- and night-call teams.

A brief informal survey of MOs who had completed rotations with the department in early 2007 suggested that they were each clerking and reviewing a median of 20 (range 15–30) new admissions each weekday while on night-call. 53% of those polled found the workload difficult to cope with about 30% of the time, while 64% thought that our hospital had the busiest medical calls when compared with other major public hospitals.

In mid 2007, we decided to add another half-call MO to cover from 5:30 pm to 11:00 pm during weekdays as this was deemed to be the busiest period of each call. Although the addition of a half-call MO helped partially in spreading out the workload during the busy evening hours, this measure did not adequately address the unbalanced workload distribution and the concerns of long working hours.

We subsequently considered a night-float system to address the above concerns. The hypothesis was that MOs starting night-calls fresh can work more efficiently and safely in providing patient care. In considering the night-float system, we were conscious of the ongoing discussions on the impact that long working hours may have on patient safety and the potential loss of crucial clinical information during the transfer of care between the different shifts of healthcare workers.<sup>(1,2)</sup> The concept of a night-float team is not new; many European countries and the US have different variants of a night-float system to fulfil various manpower constraints.<sup>(3)</sup> The night-float system we use, as far as we are aware of, is unique. Our proposed system is one that can be adapted to our local context and practice.

The details of our night-float system are shown in Table I and are compared with the current system in Tables II and III for weekdays and weekends, respectively. On weekdays, half-call MOs work from 5:30 pm to 10:30 pm and night float MOs from 8:30 pm to 8:00 am the following morning. On weekends, the half-call MOs work from 11:30 am to 8:00 pm and the night-float MOs, from 6:00 pm to 8:00 am the following morning. There is a two-hour overlap period between the half-call and night-float MOs. During this time, the half-call MOs finish their outstanding tasks, review and pass over cases before going off-call. This workflow allows for the proper handover of patients between the half-call and night-float MOs during the overlap period, and at the same time, provides more manpower during the busy evening period.

**Table I. New night-float system.**

Weekdays			Weekends		
Time	Event	Personnel Involved	Time	Event	Personnel Involved
8:00 am – 5:30 pm	Normal weekday working hours	Daytime MOs	8:00 am – 11:30 am	Weekend working hours	Daytime MOs
5:30 pm – 10:30 pm*	Half-call period	2 half-call MOs	11:30 am – 8:00 pm*	Half-call period	2 half-call MOs
8:30 pm – 8:00 am the following morning	Night-float period	2 night-float MOs	6:00 pm – 8:00 am the following morning	Night-float period	2 night-float MOs

Two-hour overlap period from 8:30 pm – 10:30 pm during weekdays and 6:00 pm – 8:00 pm during weekends, where four MOs (two half-call MOs and two night-float MOs) are present in the hospital.

MO: medical officer

**Table II. Comparison of the old and proposed systems on weekdays.**

Old night-call system		New night-float system	
Time	Event	Time	Event
8:00 am – 5:30 pm	Normal weekday working hours	8:00 am – 5:30 pm	Normal weekday working hours
5:30 pm – 8:00 am	Night-call	5:30 pm – 10:30 pm	Half-call
		8:30 pm – 8:00 am the following morning	Night-float

**Table III. Comparison of the old and proposed systems on weekends.**

Old night-call system		New night-float system	
Time	Event	Time	Event
8:00 am – 11:30 am	Normal weekend working hours	8:00 am – 11:30 am	Normal weekend working hours
11:30 pm – 8:00 am	Night-call	11:30 am – 8:00 pm	Half-call
		6:00 pm – 8:00 am the following morning	Night-float

The same two night-float MOs work five consecutive nights (Monday to Friday) while different MOs rotate to cover as half-call MOs. The night-float MOs on Saturday and Sunday are different MOs. The cycle is repeated when the workweek begins on Monday. After five days of night shift, the night-float MOs utilise the weekend to adapt back to normal sleeping hours before starting work again on Monday. This strategy optimises our limited manpower resource and minimises the disruption to inpatient care during working hours.

A four-week trial was carried out in July and August 2007 involving eight volunteer MOs and an informal evaluation was conducted at the end. All eight MOs felt more alert during their night-float calls as compared to traditional calls. They felt that this translated into better patient care. Being more energetic, the MOs reviewed patients more thoroughly and were better able to apply problem-solving skills to arrive at more comprehensive differential diagnoses or problem lists. This, in turn, resulted in better learning for the individuals. One of the advantages of being on-call five nights in a row was that the MOs became more familiar with the patients under their care. This continuity of care also allowed the MOs to follow up on the investigative and management plans that they had commenced the night before. In addition, they reported having had more time to read up and review the literature to improve their knowledge and the management of the medical conditions encountered.<sup>(4)</sup>

These unique learning opportunities were possible due to the MOs being on call on consecutive nights. Moreover, they were supervised by the medical registrar on-call, thus ensuring that appropriate management plans were promptly instituted. The number of patients seen per night per MO during the night-float week was a median

of 15 (range 12–30) per weekday visit. Perhaps the most significant finding was that none of the MOs found the workload difficult to cope with at any point during their calls. As quality of patient care can be compromised when the workload exceeds manpower capacity, this was an important improvement. Feedback from senior clinicians affirmed that the quality of documentation and clerking improved substantially during this trial period. This suggested that our night-float call system is a workable solution in addressing the issue of excessive workload during night calls.

The implication of the night-float system to manpower planning is that the night-float MOs are not involved in daytime ward duties during the night-float week. At the same time, compared to the traditional call system where post-call MOs go off-duty each weekday afternoon, there are now no MOs going off-duty on weekdays in the new night-float system except on Monday afternoons, where the Sunday night-float MO goes off-duty, resulting in less disruption to daytime patient care. With support from the hospital's management board, our department implemented this night-float system in May 2008.

Although the traditional night-call system in Singapore has been time-tested to be effective, we attempted to investigate if there may be another system that can improve work efficiency and provide better patient care. There are, at present, no objective measures, but we believe that the night-float system has had a positive impact on patient care and MO training and welfare, and we are heartened by the positive responses during the trial. Impact on workflow efficiency and ground processes is likely to be neutral or positive, and this can be addressed in future surveys.

Yours sincerely,

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