

Residents' Work Schedule and Patient Safety

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Total numbers of doctors are increasing in Nepal, so are educational institutes providing training to the residents to become specialists in their own specialty. It is not known how many of these medical colleges have well defined rules on Resident's work schedule. Resident's work schedules have direct bearing on patient care and safety. Shorter working hours may not always be best in term of patient safety. This review ponders on these questions and makes some recommendation for our young doctors' work schedule.

Residencies as an opportunity for advanced training in a medical or surgical specialty evolved in the late 19th century from a brief and less formal program to extra training in a special area of interest. They became formalized and institutionalized for the main specialties during the early 20th century.

It is unfortunate that, although the practice of medicine has changed dramatically during the last century, the system of Residency has changed very little since Dr. William Osler initiated this method of training at John Hopkins University in 1889. Dr. Osler brought students out of the classrooms into hospital wards as "clinical clerks".¹ His principle that medical education succeeds best when undergone in proximity of the patient and conducted in atmosphere of collegiality is very much accepted even today, even though the pedagogic methods of that time have been replaced by the androgogic approach.

The first residents lived a monastic existence, actually residing in the hospital, and were paid no salary. Even now the residents are collectively called the "house staff" of a hospital. This term comes from the fact that resident physicians traditionally lived the majority of their life "in house" i.e. the hospital.

On call work in earlier days was full-time, with occasional nights and weekends off as privilege. One night in two was common, which later became one night in three. Dr. Risa Moriarty, a resident at John Hopkins Hospital, Baltimore decided to quit two and a half years into a seven year program of Plastic Surgery after dozing off in an operating room during a sixty-hour shift without sleep. "That's three days and two nights on call in the hospital with no sleep other than brief naps. It takes an altered state of mind to get through it. Residency turns you into a very efficient machine," she said.²

Why do the doctors then persist in continuing such onerous and dangerous training and staffing practices? "Medicine is a militaristic culture," says Moriarty. "It is hierarchical." Older doctors who went through the same rite of passage may believe that it weeds out those who do not have the "right stuff." Critics of long residency hours trace the problem to the fact that residents have no alternatives to positions that are offered, meaning residents must accept all conditions of employment, including very long hours, and they must also, in many cases, contend with poor supervision.³

Today's residents receive a salary and benefits (although many in Nepal still do not). Work hours exceeding 100 hours are still common and thirty six-hour shifts often are routine. Sleep deprived residents – the least experienced physicians – are likely to be the first doctors to examine a patient in a hospital emergency room. With pressure on hospital beds, improved communication and rising medical costs, today's patients are often sicker even as they spend less time in the hospital than in the past. A greater number of potential diagnostic tests – where test results require interpretation and follow up decisions and fear of litigation ("direct action" in Nepali context) – keep the doctors always on their toes.

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Studies have shown that more fatigued residents make more medical errors than less fatigued ones. For years, patient advocates and legislators have called for less grueling hours for medical residents to reduce the chances of medical errors.⁴⁻⁶ Research from Europe and the United States on nonstandard work hours and sleep deprivation found that late-hour workers are subject to higher risks of gastrointestinal disorders, cardiovascular disease, breast cancer, miscarriage, preterm birth, and low birth weight of their newborns.⁷ Chronic sleep deprivation and the resulting fatigue and stress can affect job productivity and the incidence of workplace accidents.⁸ There are also social effects. Married fathers in the United States who work fixed night shifts are six times more likely than their counterparts who work days to face divorce; for married mothers, fixed nights increase the odds by a factor of three.⁹ On the basis of literature of the effect of sleep on performance, the authors recommended efforts to reduce both fatigue and sleepiness.⁴ In the medical profession too, some studies evaluated the link between performance and sleep deprivation.¹⁰

On July 2, 2003, the Accreditation Council for Graduate Medical Education (ACGME) instituted standards for all accredited residency programs, limiting the workweek to 80 hours a week, averaged over a period of four weeks. These rules were called "**work hour rules**".¹¹ Among other things, these limited a resident to do no more than 24 hours of clinical duties at a stretch with an additional six hours for transferring patient care and educational requirements (with no new patients in the previous six hours), and a night call no more often than one in three nights. Even with this it was felt that the US residents still work too many hours and that currently permitted 30-hour shifts and 80-hour workweeks are unsafe for doctors and patients.⁵

So do short duty hours work the best? Short working hours mean more hand offs from one doctor to another and discontinuity of care. Research also suggests that discontinuity of care and more frequent hand-offs, which come as a result of shorter shifts, could eventually mean more errors.¹² In some studies, numbers of hand offs during a patient's hospital course were recorded and have been shown to have direct correlation with significant medical errors. In this scenario responsibility of a patient is frequently transferred from one resident to another. How many senior doctors have not made a mistake on coming and taking charge of a ward after a two week vacation because of difficulties in finding out all about the patients in a very short time without a handoff?

In a hospital with frequent hand offs, consultants may feel that they are really the only people who have continuity with the patient as residents come and go.

Because of this, some have recommended "twice daily rounds by consultants to facilitate shorter shifts of residents".⁵

In US, there is no reliable national data measuring the effect workhours limitation on training or patient care.¹¹ A systematic review in 2004 on Effects of Resident Work Hours on Patient Safety, reviewed abstracts of more than 1330 papers; 343 of these were selected to be included in the review. Papers selected for inclusion studied effect of system change or intervention to decrease resident work hours, fatigue or sleep deprivation on patient safety as outcome. Authors concluded that it is possible to reduce work hours without increasing patient load. Doing so may affect patient safety positively, as perceived by frontline providers. The generalizability of this study may be limited by its setting in large two tertiary care university affiliated hospitals.¹³

A complex relationship between continuity of care, fatigued providers and patient safety was acknowledged. It was felt that continuity between admission and the remainder of care is more important than continuity from hour to hour. The review showed fewer medication errors after the schedule to assure intern and resident on a given team, admitting patients together more often than alone. This provided increase in continuity. This may have contributed to fewer medication errors.¹⁴ It was found that medication errors (a task-based activity) might be more sensitive to fatigue than are complications and test delays, both of which may be more sensitive to decreased continuity. Strategies to reduce medical errors are also outlined by other author.

Complication rates increased and diagnostic test delays occurred in a study that replaced the resident on call at 11 PM with a non-unit resident for covering the unit. The primary team may not get to know their patients to the same level of detail, if their resident has not worked up the patient at admission. The finding that more laboratory tests per patient were ordered when a cross-covering resident admitted patients, as compared to when the unit resident was the admitting doctor, corroborated this.¹³

The impact of ACGME work hour limits implemented on July 1, 2003, was assessed by a pre implementation and a post implementation survey. From 2003 to 2004, a significantly lower proportion of residents believed that various work situations in patient care – working too many hours ($P < 0.001$), admitting too many patients ($P = 0.001$), inadequate supervision ($P = 0.03$), cross covering too many patients ($P = 0.001$) – contributed to mistakes in patient care.¹⁴

Numerous other studies have also tried to find effect of reduced work hours on patient outcome, but the net effect remained inconclusive. Because this kind of study

is very resource intensive and thus cannot be done throughout the hospital, a study with a narrow focus was done on two intensive care units. Lower rates of medical errors were seen in the reduced hours' group. This led to increased number of residents needed for ICU cover and left other units more thinly covered.¹⁵⁻¹⁹

A new report on resident duty hours provided clear evidence that fatigue increases chance of human error. On the basis of this study results, several changes to current recommendations of maximum 30-hour shift, including direct patient care for 24 hours and training and transition activities for remaining 6 hours were made. Specific recommendations were as follows:

Residents who complete a 30-hour shift may treat patients only for 16 hours, followed by a 5-hour protected sleep period between 10PM and 8 AM, during which other nonsleeping residents or additional staff members will manage patient care. Supervision of working hours should be increased because of frequent underreporting of work hours. Periodic independent reviews of working hours were recommended.

Internal or external moonlighting is restricted to ACGME limit of total work of 80-hours a week.

To facilitate recovery from working long shifts, IOM recommended guaranteed five days off per month with a 24-hour off each week and one 48-hour off each month.

Hospital on call periods for residents limited to no more than one in three nights.

Because the risk of motor vehicle accidents more than doubles when residents drive home after working extended shifts, hospital should provide safe transport to these residents.

Residents should receive more training on communication, using a structured team approach, during change of shift handovers. Residents should be more involved in patient safety activities and in adverse event reporting not only to improve quality of care but also to enhance their educational experience.

Various strategies have been suggested to minimize errors because of continuity of care. All of these have emphasized effective hand written, printed or computerized handoffs. (19, 20)

Europe has always been ahead in this regard. The European Working Time Directive (EWTD) is European Union legislation and is enshrined in UK law as the Working Time Regulations 1998 (WTR). The WTR have applied in full to most workers, including all employed doctors, other than those in the training grades, since 1 October 1998. On 1 August 2004, the WTR working

hours limits began to be phased in for doctors in training, beginning with a 58hr average weekly limit, reducing to 56hrs on 1 August 2007. The remaining requirements for junior doctors have been in effect since 1 August 2004. On 1 August 2009, the maximum number of hours that a junior doctor can work will decrease from 56 to 48 hours per week.

There is a feeling that adapting junior doctor training programs to meet the EWTD will not be easy. There is particular concern over training for junior doctors as a result of implementation, particularly in the 'craft' specialties. The craft specialties are those in which trainees develop particular skills that are best learnt by direct experience with patients, often in elective settings. Innovative techniques will have to be used. There are a number of ways in which training can be improved in order to enable compliance with the EWTD such as ensuring that junior doctors are only involved in procedures that are suitable to their level of training, reducing inappropriate work such as bureaucracy, and maximizing the innovative use of technology. Lengthening training is also felt to be a solution by some.

With this background, we will have to decide what we should do in Nepal. It is clear that there have to be rules about Residents' work hours. A doctor working 24-hours a day, 7-days a week in a busy District Hospital is not safe for the patients. A resident in a Kathmandu hospital, working 100-hours-week, and working 60-hours at stretch is equally unsafe. Similarly a resident working only 4 hours a day on most days is also not productive because of very short hours of work; and is not safe because he does not provide continuity of care.

We may have to opt for ACGME type of work hours. Unnecessary and inappropriate work will have to be reduced. We cannot lengthen the training period of the residents; as trained specialist doctors are few and are expected to join the work they are trained for.

What comes out of this review very clearly is that the technique of hand over must be emphasized and taught. Supervision of residents must be good. Inadequate and sloppy hand overs at the change of duty time must not be tolerated. Work hours must be monitored. There should be mandatory days off and prohibitions against moonlighting (or working extra jobs) must be in place.

To create training programs that deliver safe and excellent patient care, high quality patient care, high quality medical education and sufficient sleep for the residents, our residency programs will need to implement many reforms which emphasize working as a team, good handovers at change of duty time,

prohibition of moonlighting (or working extra jobs) and good supervision.

The following specific methods are recommended with improved communication during transition of care:

Written hand offs of at least most sick patients.

Signing out as a team, when applicable. This ensure that least lapses of communication

Providing a separate to "do list".

Recording overnight events on the sign-out form for delivery to incoming team.

Use of formal morning report.

The biggest challenge is teaching residents that their conscientiousness is best expressed by ensuring that their patients are well cared for while on duty and also while off duty.

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