

## The Heidelberg New Working Time Model



A new working time model has been proposed by researchers at the University of Heidelberg which may improve patient care quality by avoiding the dangers of rotating work shifts, such as a loss of care continuity, and by ensuring adequate surgical training hours for residents. The new model, which is compliant with the European Working Time Directive (EWTD), advises hospitals to carefully analyse current workload requirements.

In the 1980s, working hours for doctors, including senior consultants, typically began at 8 a.m. and ended at 6 p.m., Monday through Friday, with junior doctors performing overnight shifts two to three times per week and throughout every second or third weekend. Over the years, discussions about overtired doctors and inadequately supervised residents highlighted a dangerous and weak point in patient care. Supported by milestones such as the Libby Zion case in 1984, directives were developed against the overworking of clinical personnel, for the ultimate benefit of both physicians and patients.

Derived from the European Directive of 1993, the European Working Time Directive was initially created to improve road safety by restricting working hours of truck drivers. It laid down minimum requirements in relation to working hours, resting periods, and annual leave. In 2004, the EWTD provisions were extended to doctors-in-training whose maximum working hours were reduced to 56 hours in 2007 and 48 hours in 2009. In addition, the longest continuous shift a doctor could perform was 13 hours with an obligatory 11-hour resting time.

### Rotating Work Shifts Means Patients Get Less Continuity of Care

Given the restrictions in total time worked and duration of hospital shifts, at least three formal handovers now occur in a 24-hour period, suggesting that patients receive less continuity of care and junior doctors experience more interrupted training time. Furthermore, because requirements for surgeons have increased due to economic pressure, more documentation tasks and higher patient loads, it has become even more apparent that the EWTD cannot be maintained.

Although working hour restrictions may produce measurably happier medical trainees with better quality of life, it can be argued that such restrictions are detrimental in the areas of work ethics, technical skills development, and decision-making/critical-thinking skills. Moreover, disjointed shift changes and frequent handoffs come at a cost to healthcare delivery; the lack of patient ownership cannot be disregarded.

### Less Training Hours For Residents

Overall, the EWTD has greatly reduced the training hours of surgical residents, which translates into 30 percent less surgical and clinical experience. Such a dramatic drop in attendance has serious implications that compromise quality of medical care. In this study, researchers from the surgical department of the University of Heidelberg aimed to establish a model that was compliant with the EWTD while avoiding reduction in quality of patient care and surgical training.

### Analysis of Current Status and Workload

To evaluate the current workload at the University Hospital of General, Visceral and Transplantation Surgery of Heidelberg, researchers performed statistical analyses of in-house data as well as of data from the financial- and personnel-controlling sectors of the hospital administration. Analyses of the performance data in the ORs, emergency rooms and surgical wards were done on the basis of ISHmed (SAP, Walldorf, Germany) for the time period from January to December 2007. ISHmed is a software program which manages patient's medical documentation including diagnosis, dates of hospital stays or outpatient clinic visits, medical reports such as operation or endoscopy reports as well as results such as lab work, X-ray and cross sectional imaging pictures.

To quantify the time of doctor performances, researchers hired an independent healthcare company whose personnel accompanied surgical attendings and residents from December 2007 until March 2008. To determine how many doctors were required for providing medical care of consistent quality (manpower requirement), researchers used the formula "required working time" divided by 1780.8 working hours (106,848 minutes), which were defined by the hospital's personnel-controlling sector as the clear working time of a full-time doctor per year.

Time constraints for research and teaching were ascertained through personal interviews and evaluated from teaching schedules of the surgical department.

Three new working time models were designed, taking into account the calculated workload in different areas of the clinic. All proposed changes met the requirements of the EWTD. The models went through a selection process and the chosen time model was implemented in October 2009. After a trial period of six months, a formal evaluation was performed in order to validate the New Working Time Model.

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Following approval by the hospital management, the new time model was implemented permanently. All data were collected in compliance with the Helsinki Declaration.

#### The Heidelberg New Working Time Model

The detailed workload analysis indicated a need for workload reduction of the on-call team between 4 p.m. and 8 a.m. to meet EWTD requirements, since the workload of this time period was around 80 percent. For example, between 5 p.m. and 8 p.m., three ORs were still operating two-thirds of the time.

The New Working Time Model addressed this problem by introducing an extended work shift (7:30 a.m. to 7:30 p.m.), effectively reducing the workload to less than 49 percent from 4 p.m. and 8 a.m. The new model allowed the combination of an eight-hour working day with a 16-hour on call duty, thus maximising surgical resident training and ensuring patient continuity of care while maintaining EWTD guidelines.

#### Conclusion and Discussion

The key for every hospital or medical department to adapt their working time model to the European Working Time Directive and their changing needs is an extensive and precise analysis of the workload. The Heidelberg New Working Time Model provides a legal model which, by avoiding rotating work shifts, assures quality of patient care and surgical training.

A three-shifts-a-day model (9-hour shifts, each with one-hour handover) is a simple model often used by the EWTD; however, it does not address the unique needs of medical care at all. The Heidelberg model is an attempt to protect surgeons' needs for adequate education and operation time, to ensure quality of patient care, and to allow a stable mentor-trainee and doctor-patient relationship within EWTD boundaries.

Compared to other medical fields, surgery, as a craft specialty, is more affected by time restrictions set by the EWTD. Since its inception, the EWTD has considerably reduced resident attendance from 225 days per year to 150–160 days per year. As a consequence, trainees perform fewer procedures because of absent time during enforced resting periods (30 percent less operations per year).

Furthermore, long operations are not work-shift compatible because team changes during operations are dangerous. The reduction in shift lengths necessarily leads to more transitions of patient care responsibility from one physician to another and, consequently, to a loss in "patient ownership thinking" as well as to an increase in administrative duties. Therefore, every European hospital is called to perform a similar workload analysis in order to determine the possibility to design a more sufficient working time model and to avoid rotating work shifts and their disadvantages.

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