Future Hospital Journal 2014 Vol 1, No 1: 62–4

Working patterns of medical staff in the future hospital

Author: 'Prospector'

OVERVIEW

The report of the Future Hospital Commission (FHC) of the Royal College of Physicians acknowledges that the principal challenge for health care organisations and professionals responsible for delivering medical services is to at all times accept the fundamental requirement that patients must be treated with compassion, kindness and respect while having their physical and emotional needs met. The recognition that clinical outcomes alone are an insufficient guide to the adequacy of health service provision demands cultural, organisational and individual change. In the Forum of the Future Hospital Journal we will try to scan the world literature for papers that can cast light upon the systems of care that might best ensure these principles are delivered, wherever they have been developed, and to critically evaluate their potential impact. The theme in this edition is the clinical working patterns of medical trainees.

The consequences of changes to clinician working patterns in Europe and the US have been debated long and hard in the medical literature. The European Working Time Directive (EWTD) of 2003 placed substantial restrictions on permitted working hours in Europe independent of occupation. The lag between the creation of the EWTD and its full implementation permitted the gradual evolution of compliant rotas for junior medical staff. Thus, following the final enforcement of a maximum 48 hour working week in 2009 the debate has largely moved to a discussion of strategies for delivering safe, effective, compassionate and high quality medical care within the constraints of the EWTD.[1]

By contrast, in the United States the introduction by the Accreditation Council for Graduate Medical Education (ACGME)[2] of regulation of the frequency and duration of on-call work was more liberal in scope (an 80-hour working week and a 16-hour cap on shift lengths) and application (to interns alone). Nevertheless, the ACGME reform provoked a far more robust debate and an extensive and largely critical literature has emerged examining its consequences for trainee work life balance, job satisfaction, educational opportunity and (most significantly) patient safety. Although outright rejection of hours reform by some US clinicians may seem unhelpful, *Prospector* suggests that the broader scope of the debate highlights valid sources of concern and confirms important challenges for those planning organizational change in the UK.

In response to criticism of the consequences of hours reduction for training of surgeons in particular, Medical Education England commissioned an independent review of the impact of the EWTD on the quality of training, overseen by Professor Sir John Temple: the *Time for Training Review*.[3] Notably, a lack of hard evidence or even recognised outcome measures from which to draw conclusions was recorded; oral and written submissions and consistent and repeated opinion and information were therefore employed as a proxy. The Review recognised 'the traditional experiential model of training in England has relied on trainees spending long hours in their place of work delivering service, during which time they developed their skills and knowledge' but considered that such working patterns are not sustainable and concluded that as a result of compression of available trainee hours more time was being used for service delivery, to the detriment of educational activity. Second, the problem was thought to be most pronounced in specialities with high emergency and/or out-of-hours workloads. Third, despite large increases in consultant numbers in the past decade, trainees are still responsible for initiating and frequently delivering the majority of this service, often with limited supervision. Finally, and notwithstanding these strictures, high quality training can be delivered in 48 hours. The principal recommendation of the Review was that EWTD should be a catalyst to reconfigure and redesign service and training and that a consultant-delivered service should be developed with senior staff working 'flexibly' in order to be able to deliver 24/7 care directly. Less controversially, changes to the planning and organisation of training were recommended, together with an increased focus on nurturing and rewarding trainers.

Both *Time for Training* and the report of the Future Hospital Commission seem to reflect a growing acceptance by the UK medical establishment that shift work has replaced the traditional on-call rota and that effective hospital systems should be developed to overcome the consequences for training, continuity of care, handover and patient safety. By contrast, in the USA the debate still seems to reflect a general reluctance by physicians to accept the need for hours reform and much of the literature is informed by this culture of rejection. In a commentary published recently in the *New England Journal of Medicine* a 'resistern' (a resident doctor now expected to make up for the substantial deficiency in intern staffing) reflects on the changing expectations of those medical students and interns following in her footsteps,[4] expressing alarm that some trainees empowered by the ACGME proposals seem less willing to work night shifts and even 'feel entitled to circadian-rhythm health' when choosing a training programme. The piece reflects what seems to be a prevailing fear amongst senior physicians in the US, that the right to work fewer hours by the most junior staff may work to the detriment of their professional values and their ability to put the patient first. Although the author had previously

believed that 30-hour shifts were 'archaic, unsupported by empirical data, and a silly type of professional hazing [fraternity initiation]', anecdotal examples of unprofessional behaviour amongst interns led her to ponder whether 'the 2011 duty-hour reforms threaten . . . to affect the process of physicians' professionalization'. The resistern also describes the redistribution of workload up the medical hierarchy. 'The intern-as-workhorse paradigm. . . . . ended with us, and the workload was redistributed to . . . us!'. This phenomenon is no doubt recognised by UK consultants now being asked to deliver 24/7 care while also assuming responsibility for the assessment and education of inexperienced and underprepared junior doctors. While the author remained cautiously in favour of hours reform and proposed that 'educators should guide physician trainees in negotiating their new professional boundaries while maintaining a primary focus on patients', exactly how this should be achieved was not described.

This 'rejectionist' viewpoint, propounding the view that working hours reform represents 'an uncontrolled experiment', is further characterised in a paper in JAMA.[5] Evidence from previous surveys suggesting that training suffers as a result of hours reform recycles the concerns raised by surgeons in the UK; that operating time had declined; that more than a quarter of consultants were no longer able to be involved in key stages of patient care and were more frequently operating without trainee assistance, and that hand-off [US speak for handover] was often inadequate. The paper concluded that the effects of the EWTD on patient safety have yet to be rigorously evaluated in the European Union, but that hours reform may hamper training, undermine one-on-one patient-physician relationships and the traditional culture of professional responsibility and accountability. More contentiously, it suggested that new rota systems potentially increase rather than decrease fatigue due to work compression and carry significant cost and cultural implications as responsibilities traditionally ascribed to house officers shift to more senior physicians. Finally, worried about the possibility of further hours reform, the authors concluded that 'it is imperative to understand the consequences and implications of the directive before sailing further into this uncharted sea.' Again, serious assertions with no proposed solutions.

So where does that leave us? Three large surveys of US training programme directors and trainees published in NEJM suggest that these viewpoints are not a minority perspective.[6–8] While a majority of programme directors were in favour of mandatory off-duty time and even supported proposals regarding maximum working hours and frequency of hospital duty, only 14% agreed with the ACGME proposal for a maximum period of 16 hours for first year residents. Further, only 29% disagreed with exceptions that would permit up to 88 duty hours per week for selected programmes. Surgical programme directors were again far less likely than their medical counterparts to agree with proposals for reform. Interestingly, some of these concerns seem to be shared by trainees; an initial survey of this group prior to the introduction of the 2011 ACGME reform indicated that the majority anticipated improved quality of life but held more negative views about the effects of the changes on the quality of care and patient safety (through loss of continuity), on residents' education, experience, and fund of knowledge, and on their preparation to undertake more senior roles. A follow-up survey allowed interns and residents to describe the effects of the reform. Despite changing shift patterns and the limit on maximum duty period, the majority had not experienced a reduction in the total number of hours worked, and reported no change or worsened educational opportunity and level of supervision. Most also felt less prepared for more senior roles and expressed the view that junior responsibility had been shifted to senior residents. This explained the finding that interns but not residents experienced an improved quality of life. The authors concluded that 'the frequency of handoffs has increased, reducing continuity of care and thereby negatively affecting the educational and emotional experience associated with a strong doctor–patient relationship'.

Such reflections are clearly open to a cultural bias and surveys conducted prior to 2011 might reflect prejudice against hours reform *per se* rather than reasonable fears. However, in the past year there have been some attempts to examine the effects of ACGME implementation in more rigorous, controlled investigations. Three large studies have examined trainee wellbeing, job satisfaction, and educational opportunities as well as patient outcomes (safety and length of stay). In the first, two ACGME 2011-compliant rota models were compared with a 'control' rota in which doctors worked under conditions conforming to earlier national regulations in a single centre.[9] The primary outcome was on-call period sleep duration measured using wristwatch actigraphy. Secondary outcomes related to operational outcomes (patient length of stay, 30-day readmissions, discharges before 11am), trainee education, continuity of patient care, sleep duration outside of the on-call period, and satisfaction of interns and nurses across domains of education and patient care. Sleep duration increased on average by 3 hours within the on-call period in both experimental models compared with controls. A benefit was also seen in post on-call sleep duration. By contrast, educational opportunities were decreased in both the experimental groups, and those working experimental rotas admitted a smaller proportion of patients and followed them up for shorter (continuous) periods. They also worked fewer hours between 8 am and 6 pm and thus had fewer opportunities to attend a daily noon conference and other traditional educational activities, including teaching rounds. The number of handoffs between interns increased from three to as high as nine in the experimental models, while the number of interns caring for a patient during a three-day stay increased from three to up to five. Trainee satisfaction was higher in the control model, including their perception of quality of care and team membership. Nurses perceived that the highest quality of care was provided to patients in the control model. Nurses also reported lower satisfaction with communication and patient safety in the experimental approach. While there were no differences in operational outcomes the authors speculated that this was due to the short duration of the study rather than equivalent efficiency between the new systems of working and the old. However, they did concede that some of the dissatisfaction and perceptions of interns and nurses might be a result of unfamiliarity with or prejudice against the new models, as well as resistance to systematic change.

The effects of reduced shift length on efficiency and quality of care has also been evaluated in a retrospective comparison of nearly 4,000 patient admissions prior to and following the

transition in the USA from the 30-hour to 16-hour maximum shift length in 2010–11.[10] Changes to the structure of rotations increased the number of weekly handoffs from 56 to 126. While no significant differences were observed for most outcome measures (length of stay, time of discharge, standardised indicators of safety and complications, observed to expected in-hospital mortality, all-cause 30-day readmissions, in-hospital rapid response and code events, and ICU transfers) recognised complications declined in the 16-hour resident cohort. Although handoff to a new team may offer opportunities for fresh insight and the recognition and correction of prior lapses in care, the authors noted that duty-hours reform was coincident with the introduction of an electronic application which may have contributed to a reduction in errors. Finally, resident duty hours are clearly only one variable in a complex hospital system that contributes to patient outcomes. Reduced resident fatigue maybe be offset by work compression and increased handoff may lead to communication errors. However, in this study the 16-hour duty hour changes seemed to have minimal effects on measures of efficiency and quality of care.

In the final paper the implementation of ACGME on the wellbeing of 2323 interns in 51 residency programs was evaluated prospectively.[11] Interns in four cohorts working prior to and following duty-hours reform and drawn from a broad range of clinical specialities completed a survey administered at quarterly intervals. Although a significant reduction in work hours (from 67.0 to 64.3 hours per week) was observed, this did not translate into an increased duration of sleep nor in improvements to depression or wellbeing scores post implementation. The numbers reporting concern about making a serious medical error actually increased, possibly through increased stress resulting from work compression offsetting any benefit accrued from a reduction in hours worked. *Prospector* notes that the authors did not comment on the extremely limited (but statistically significant) nature of the observed reduction in duty-hours they identified. It could be suggested that if intern wellbeing is the goal, a more radical approach to hours-reform in line with EWTD might be more effective rather than the 'alternative strategies' which the authors proposed.

This issue's Forum concludes with another personal reflection, again published in the *New England Journal of Medicine*, confronting the rejection of reform without recourse to statistics.[12] In an insightful reflection on training 'in the bad old days' (the 1980s!) the author reflected that his supervisors considered his working conditions soft, while he adhered to what he describes as a 'crazy, dangerous schedule' which put both patients and physicians at risk. Looking back with nostalgia, he recognises the benefits to training and professional pride of being the only doctor awake, carrying all the responsibility for getting the patients through the night and learning to care for critically ill patients without support. Taking the FHC perspective *Prospector* is pleased the author stressed the need to find alternative ways to teach new generations of physicians, no longer exposed to such hardship, that being there for the patient counts above all and outweighs personal imperatives.

Prospector speculates that this memoir closely reflects a training experience shared by many who worked as junior doctors in the UK prior to the institution of hours reform. Working without sleep and unsupported by more senior doctors, he learned early in his career to make independent yet effective clinical decisions regarding the care of critically ill patients which has informed his subsequent choice of specialty. Yet many will contend with equal authority that under such working conditions they frequently felt afraid, out of their depth and barely able to cope. Such experiences strongly mandate the need for hours reform. Attempting to achieve this via implementation of the EWTD and ACGME has given rise to important challenges highlighted in the literature presented here. Scientific study should not be necessary to understand that fatigue is dangerous or that by reducing the frequency of on-call work trainees will be exposed to fewer admissions experiences and an increased reliance on effective handover. What is required is development and evaluation of the most appropriate ways to support trainees so that they are able to receive high quality training within a 48-hour week while also ensuring that standards of excellence in clinical provision, handover and robust transfer are all equalled by the patient experience. ■

DANIEL D MELLEY
Consultant in adult intensive care
Royal Brompton Hospital, London, UK

References

1 Future Hospital Commission. *Future hospital: caring for medical patients.* A report from the Future Hospital Commission to the Royal College of Physicians. London: Royal College of Physicians, 2013.
2 Accreditation Council for Graduate Medical Education. *Duty Hours.* ACGME, 2011.
3 Temple J. *Time for Training: A review of the impact of the European Working Time Directive on the quality of training.* Medical Education England, 2010. Available online at www.mee.nhs.uk/PDF/14274%20Bookmark%20Web%20Version.pdf.
4 Johnson V. A resitern's reflections on duty-hours reform. *N Engl J Med* 2013;369:2278–9.
5 Axelrod L, Shah DJ, Jena AB. The European Working Time Directive: an uncontrolled experiment in medical care and education. *JAMA* 2013;309:447–8.
6 Antiel RM, Thompson SM, Reed DA, James KM *et al.* ACGME duty-hour recommendations - a national survey of residency program directors. *N Engl J Med* 2010;363:e12.
7 Drolet BC, Spalluto LB, Fischer SA. Residents' perspectives on ACGME regulation of supervision and duty hours – a national survey. *N Engl J Med* 2010;363:e34.
8 Drolet BC, Christopher DA, Fischer SA. Residents' response to duty-hour regulations – a follow-up national survey. *N Engl J Med* 2012;366:e35.
9 Desai SV, Feldman L, Brown L, Dezube R, *et al.* Effect of the 2011 vs 2003 duty hour regulation-compliant models on sleep duration, trainee education, and continuity of patient care among internal medicine house staff: a randomized trial. *JAMA Intern Med* 2013;173:649–55.
10 Choma NN, Vasilevskis EE, Sponsler KC, Hathaway J, Kripalani S. Effect of the ACGME 16-hour rule on efficiency and quality of care: duty hours 2.0. *JAMA Intern Med* 2013;173:819–21.
11 Sen S, Kranzler HR, Didwania AK, Schwartz AC, *et al.* Effects of the 2011 duty hour reforms on interns and their patients: a prospective longitudinal cohort study. *JAMA Intern Med* 2013;173:657–62.
12 Klass P. Getting through the night. *N Engl J Med*,2013;369:2279–81.