Why have working hour restrictions apparently not improved patient safety?
Weak evidence, inadequate regulation, busier doctors, and discontinuity of care are possibilities

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Restrictions on hours worked by medical trainees have been in place in the United Kingdom since 1996 and across the United States since 2003. In their systematic review (doi:10.1136/bmj.d1580), Moonesinghe and colleagues concluded that these restrictions have had no negative impact on patient care and medical education; similar results were found in other reviews.1-3 It is reassuring that these changes do not seem to have negatively affected education, although we will not know their full impact until several years after these trainees are in independent practice. However, given that one of the fundamental principles behind these reforms was to improve patient safety,4 why have they not benefited patients?

It seems self evident that a reduction in work hours should lead to improvements in patient safety and outcomes. Irrefutable evidence shows that fatigue impairs performance on standardised assessments, both in cognitive and procedural specialties.4 In the real world, however, a simple mandate of working fewer hours may not have improved patient care for many reasons.

Firstly, as the review makes clear, the evidence base is weak. Many studies are single site, retrospective, non-randomised, and of low to moderate quality. However, the review included 12 multisite studies involving millions of patients: not one of these found a clearly positive effect on patient outcomes. It is unlikely, therefore, that studies have simply failed to observe a real effect.

Secondly, the regulations may not have been fully implemented in practice, they may have been implemented but the hours not reduced sufficiently, or house staff may not have used the additional time off to sleep. An inadequately conducted or insufficiently aggressive intervention is unlikely to produce meaningful effects. Few studies in this review provided data on hours worked or compliance with policies. We know that trainees routinely flout regulations on working hours in the face of urgent patient care needs, and that they do not fully substitute sleep for fewer hours of night work.6 Nonetheless, epidemiological evidence of reductions in motor vehicle crashes,7 needlestick injuries,8 and mental illness6 since the advent of regulations on working hours strongly suggests that trainees are generally now less tired than before. Thus, inadequate regulation is also unlikely to fully explain the neutral effect of the reduction of work hours.

Two other explanations are more likely. Firstly, work hour reform is effectively an unfunded mandate. A recent study estimated the cost of limiting residents to 16 hour shifts in the US at $1.6bn (£1bn; €1.2bn).9 Although hospitals have hired additional attending physicians and ancillary staff, house staff are often asked to do the same amount of work in less time. A busier, rushed trainee may be more prone to errors, counterbalancing any benefits of a reduction in fatigue.

Secondly, the decrease in hours worked has led to a substantial increase in discontinuity of care, handovers, and transfers.10 Ample evidence shows that these handovers may result in errors and adverse patient outcomes.11 These too may counterbalance beneficial effects of reduced fatigue.

Overall then, this lack of an effect on patient safety is probably the result of intrinsic effects of the work hour rules themselves, not limited evidence or insufficient reductions in fatigue. This
bodes ill for hopes that even greater reductions in work hours will produce greater improvements in patient care. Unfortunately, the authors found no data from mainland Europe at all and only three studies on patient outcomes from the UK, so it is difficult to understand the additive effect of greater reductions in working hours. It is imperative that the European research community contributes to this debate by conducting studies—ideally with concurrent control groups—on the effects of their more stringent regulations.

Nonetheless, given the benefits of reduced working hours on the safety and mental health of house staff, as well as the drawbacks of excessive fatigue, it is clear that reduced working hours for trainees are here to stay. The key now is to ensure that implementation is designed to mitigate the known adverse effects of reduced working hours. Until now, regulatory agencies and local implementers have focused on hours worked to the exclusion of other concerns. The new US regulations effective from July 2011 mention for the first time the need to reduce and monitor handovers as well as hours, but few studies have compared alternative shift designs and handover structures within working hour limits. Similarly, no long term follow-up of trainees who have finished a programme of limited working hours has been conducted. Without careful and continued attention to these matters, followed by adjustments to regulations and to practice as required, regulation of working hours is unlikely to have the beneficial effects for patients that regulators and the general public had hoped for.

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