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BMJ 2007;334:777-778
doi:10.1136/bmj.39154.516667.BE

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Implications of shift work for junior doctors

Yasmin Ahmed-Little provides evidence that junior doctors' dislike of shift working is more than a stubborn reaction and discusses how to make shifts more tolerable

Junior doctors in the UK have seen their working hours cut through implementation of the European Working Time Directive and the Department of Health's new deal to improve working conditions.^{w1 w2} However, the resulting increase in shift working has caused great dissatisfaction. Juniors report fatigue and poor performance on the night shift,¹ and evidence from outside medicine suggests there may be long term health effects. Concerns have been raised about future recruitment and retention, particularly in the acute 24 hour specialties. Shift working is likely to increase further as junior doctors' working hours are reduced to a maximum of 48 hours per week by 2009. Without an evidence based approach to the implementation of such large scale changes, there is a real danger of adding new, unknown risks and perhaps even worsening the status quo.²

Shift working patterns in the UK

Traditionally junior doctors worked long hours in a resident, on-call capacity with continuous shifts of up to 56 hours, and an average working week of up to 72 hours of duty.^{w2} The performance implications of these working patterns are now widely recognised, and increases in the UK medical workforce have allowed sensible reductions to working hours and the introduction of full shift working.

Full shift working for UK junior doctors usually means a fixed normal working day plus rotating long day shifts and regular weeks of night shifts. Although overall working hours have reduced, the proportion of out of hours working has increased. This affects training because established international evidence shows that people's capacity to learn overnight is significantly impaired and sleep is required to consolidate new learning.³ Most full shift rotas currently require junior doctors to work seven consecutive, 13 hour night shifts.¹ The Royal College of Physicians recently recommended avoiding such rostering.⁴ It suggests limiting consecutive night shifts to a maximum of four and reducing the duration of shifts in order to decrease the risk to patients and staff. Single night shifts are safest, but more doctors would be required to support such rotas, which is unlikely to be affordable.

Health effects

Plenty of evidence supports the negative effect on health and performance of working long hours.^{w3 w4} Some studies specifically support the European limit of a maximum 48 hour working week.⁵ Many of these lessons come from industry and may not be directly transferable to medicine. However, young doctors would benefit from better awareness of the potential dangers of shift working in general.⁶

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Epidemiological studies suggest shift working increases the risks of peptic ulcers,⁷ diabetes,⁸ and coronary heart disease.⁹ Researchers in Denmark hypothesised that up to 20% of cardiovascular disease in the country could be prevented if psychosocial risk factors such as stressful working conditions, passive smoking, and shift work were not present.¹⁰

Few studies have considered the effects on women, but it seems they may be affected more than men. For example, a population based case-controlled study from Denmark found a 50% increase in the risk of breast cancer in women working regular night shifts.¹¹ A cohort study of American female nurses showed a dose dependent response, with the risk of coronary heart disease rising as the number of years of shift work increased, and suggested that working night shifts for six or more years significantly increases cardiovascular risk.¹² Rates of miscarriages, low birthweight babies, and premature births are also more prevalent among shift workers,^{w5 w6} with some researchers recommending that women are relieved of shift working duties during pregnancy on the strength of current evidence alone.⁷

These findings have repercussions for planning the future workforce given the rapidly increasing proportion of women in medicine.¹³ Many women may also wish to work part time at some point, so lengthening the years they will spend working night shifts. Societal costs of treating the adverse outcomes of shift work, especially among women, may outweigh the benefits gained. It is unclear whether knowledge of the potential health effects would deter women from agreeing to shift work or whether junior doctors need to give informed consent.

Similarly it may not be possible to ask senior doctors to work resident shifts without compromising their health. Tolerance and adaptation to shift work seems to decrease with age, with researchers recommending that those aged above 40-45 years should work fewer night shifts, if they work them at all.^{2 14 15 w5} The more experienced junior doctors are already unhappy about working shifts.¹

SUMMARY POINTS

Working night shifts may have a detrimental effect on health

Reduced working hours have resulted in junior doctors working more shifts

Health employers should educate doctors about the risks of shift working

Rotas should be devised to minimise the adverse effects

Future planning must accommodate the potentially increased risks for women and poorer tolerance of people over 40-45 years

Making shifts work

Tolerance to shift working can be increased through improved rostering (box).^{4 15 16} The design of rotas must be evidence based to minimise the potential detrimental effects on employees' health and performance. One solution is to reduce the frequency of night shifts for individual doctors, either by increasing the pool of doctors providing overnight cover or initiatives such as Hospital at Night, which uses competency based multidisciplinary teams to provide out of hours cover.¹⁷ Minimising the number of consecutive night shifts worked would also help. Accumulated sleep deprivation from consecutive night shifts worsens daily, leading to poorer health and performance. One study recommends a minimum of 16 hours off duty between shifts to allow workers to get at least seven hours' sleep.^{w7}

When these options are not feasible, a range of compensatory measures can minimise the effect of shift work on individuals' health and performance. These include the strategic use of caffeine or bright lights through the night shift,^{18 w9} although strong evidence is lacking for any one approach. Many of the adverse outcomes from shift working are mediated through sleep deprivation. Structured naps during the night shift supported with appropriate rest facilities can optimise rest, compensating for sleep loss. Access to private rooms where employees can sleep after a night shift can alleviate fatigue before driving home. Better provision of extended NHS childcare facilities should help women tolerate shift working, as many struggle to rest between night shifts because of domestic and childcare responsibilities.¹⁵

Longer term there is evidence that regular exercise can improve tolerance to shift working, as well as moderate physical exercise a few hours before the main sleep when working nights.^{14 15 w10} Trusts should be given more support to provide exercise facilities for NHS staff. Occupational health departments could also have a proactive role in education and surveillance, supporting health promotion around shift working, discussing the range of compensatory measures, and advising staff with sleep disorders.

Future challenges

If the problems of shift working are not taken into consideration now, there may not be enough trained junior doctors available to staff junior medical rotas when the 48 hour working week becomes a legal requirement.¹⁹ Changes to postgraduate medical training may mean junior doctors no longer have the appropriate skills to deliver service. Skill mix and new ways of working will provide solutions only at the most junior grades and are unlikely to replace the level of competence at which general medicine or general surgery specialist registrars currently operate, for example. The Department of Health's aspiration of a future NHS led and delivered by consultants^{w12} could fail, owing to a lack of staff over the age of 40 prepared to work the shifts required to provide this, and few appropriately skilled juniors remaining to make up the shortfall.

Knowledge is the key. The NHS has a responsibility

EVIDENCE BASED ROSTERING

- Consecutive night shifts should be minimised and the maximum number of weekends possible kept free⁸
- Shifts are better tolerated when they rapidly rotate in a clockwise manner that is, they change every few days in a morning, afternoon, then night pattern (phase delay)
- Individual shifts should last no longer than 10-12 hours
- Employees are more likely to accept a specific shift working pattern positively if they have participated in its construction¹⁵

to improve rostering to reduce adverse effects and to provide education about the dangers of and coping with shift working through appropriately resourced occupational health departments. Research is also essential to improve our knowledge of the effects on doctors specifically and to determine whether reduced working hours affects the ability to cope with night shifts. Most studies have examined groups of workers doing long hours and night work, as most shift workers do both. The advice given here applies to other health systems and other professions.

Contributors and sources: YA-L is a part time trainee. She has led work on issues related to junior doctors' hours, including the European Working Time Directive, in Greater Manchester since 2003. This article arose from a secondary review of existing literature conducted as part of her masters dissertation in health services management at Manchester Centre for Healthcare Management.

Competing interests: None declared.

Provenance: Non-commissioned, externally peer reviewed.

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