A survey of the safety of doctors driving home after a night 'on call'

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The 'on-call' system for doctors within the health service maintains a continuity of care. However, allowing doctors to drive home after a night on call may pose a public hazard. The aim of this survey was to assess doctors' opinions regarding the safety of driving without adequate sleep.

Driving within the speed limit when sober is safe. In the event of an accident, insurance companies usually settle the claim. In the Selby rail crash, the cause of the accident was ascertained to be the driver's negligence; the driver of the car had been driving without adequate sleep when the car slipped off the road onto the railtrack (Stokes, 2002). Thus, driving without adequate sleep is no longer an excuse for an accident. In the event of an accident, if there was loss of life, prosecution for manslaughter is now a possibility.

Within the health service, the doctors' 'on-call' system, which involves staying up at night, can maintain continuity of care. However, lack of sleep is associated with a delayed reaction time and limited attention span. Giving tired doctors a day off after a night on call safeguards patients' welfare, but allowing these doctors to drive home may pose a public hazard. This survey aimed to assess the opinions of doctors regarding driving after a night on call.

MATERIALS AND METHODS

A questionnaire survey was conducted through circulated forms and telephone interviews within a district general hospital (*Figure 1*). Doctors from all specialties were included, except the accident and emergency services, as they operate on a shift basis rather than an on-call rota.

The survey asked about the seniority of doctors involved and whether they had the recommended 6 hours of protected sleep while on call. It also enquired whether doctors drove home after a night on call, the distance they drove and whether they had ever fallen asleep while driving. Doctors were asked whether they knew the medicolegal implications and insurance liability of driving without adequate sleep. They were then asked about the alternatives they had to driving home after being on call. All results were expressed as percentages. The association between the possibility of falling asleep while driving and the distance travelled was cal-

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Figure 1. Form used to survey doctors' opinions about driving after a night 'on call'. Obs and gynae = obstetrics and gynaecology; paeds = paediatrics; PRHO = preregistration house officer; SHO = senior house officer; trauma and orthop = trauma and orthopaedics.

Specialty

Medicine	Surgery	Paeds	Obs and gynae	Anaesthetics	Trauma and orthop

Grade

PRHO	SHO	Registrar

'On-call' rota

1st 'on call'	2nd 'on call'	3rd 'on call'

Do you have protected sleep

Yes	No

If yes, how many hours?

<5	5–8	>8

Do you drive after being 'on call'?

Yes	No

If yes, how many miles?

<15	15–30	>30

Have you ever fallen asleep while driving after being 'on call'?

Never	Occasionally	Frequently

Does your trust provide a post-'on-call' room/ accommodation free of charge?

Yes	No	Do not know

Are you aware of any legal implications of driving after lack of sleep?

Yes	No

Has your trust highlighted any of these implications to you?

Yes	No

Are you aware of any restrictions imposed by insurance companies on driving with a lack of sleep?

Yes	No

What would you like your trust to provide after a night 'on call'?

Transport home (e.g. taxi)		Reimburse you for public transport	
Provide post-'on-call' accommodation		Continue with current practice	

culated as an odds ratio (OR) with a confidence interval (CI).

RESULTS

Fifty-five out of 69 doctors participated in the survey, giving a response rate of 80%. Most of those questioned did a first or second on-call rota (this indicates their level of seniority), with only nine (16%) having 6 hours of protected sleep. Thirty-six doctors (65%) drove home after a night on call, with 24 of these driving more than 30 miles.

Out of 36 doctors questioned, 11 (31%) said they had experienced episodes of falling asleep (even transient) while driving. Eight out of 24 doctors driving more than 30 miles home said they had fallen asleep at the wheel, compared with three doctors out of 12 who drove less than 30 miles each day (OR=1.5, CI=0.316–7.124) (*Table 1).*

More than half (56%) of doctors questioned said they were aware of legal implications of driving without adequate sleep. Ten per cent of doctors questioned felt their insurance companies might not pay up in the unforeseen event of them having an accident while driving without adequate sleep.

Opinion was divided over whether the local trust would provide doctors with accommodation after a night on call, although most doctors (60%) felt it was unavailable. Only 2% of those surveyed felt that someone in the trust had discussed problems associated with driving without adequate sleep.

A variety of solutions to this problem were suggested. Providing transport home was the most acceptable solution (55%), followed by the possibility of providing post-on-call accommodation (20%) (*Table 2).*

DISCUSSION

In accordance with the Working Time Directive for junior doctors (NHS Management Executive, 1998), no doctor should be on duty for more than an average of 72 hours each week on an on-call rota, 64 hours on a partial shift or 56 hours on a full shift. In any working pattern, the actual hours of work should not average more than 56 hours. This is roughly equivalent to resting for half of the 'out-of-hours' period on an on-call rota and a quarter of the out-of-hours period on a partial shift. Many junior doctors are still working more hours than they should because the total number of duty hours is too high, perhaps caused by early starts and late finishes.

Most healthy doctors require at least 6 hours of 'core sleep' (Horne, 1991). Failure to get this leads to sleepiness, irritability, loss of concentration and impaired performance, especially during complex but monotonous tasks such as driving (Eberhart et al, 2000). However, the effect that a night on call has on driving has never been evaluated. Besides lack of sleep, the stress and continuous physical and mental exhaustion of a night on call may take its toll.

Only nine of the 55 doctors (16%) felt they had protected sleep. About one-third of doctors admitted to falling asleep at the wheel, the same statistic as the general population of car drivers in the UK (Maycock, 1996). A driver who feels close to sleeping at the wheel has a 50% higher risk of accident (Maycock, 1996; Reyner and Horne, 1998). However, this survey did not ask this sample of doctors if they had had any accidents while driving after a night on call as this is a sensitive issue.

This survey found that the distance travelled was not a factor for lapse in concentration compared with other car drivers. This is not surprising, as the major factors in build up of fatigue are:

- Time on task
- Time since awake
- Task type
- Environmental factors.

The difference between doctors driving after a night on call and other car drivers is that although the 'time on task', i.e. distance travelled, may be small, the 'time since awake' is quite high.

Only 56% of doctors were aware of the medicolegal implications of driving without adequate sleep. The Selby rail crash enquiry implicated the driver of being reckless and driving without sleep; he was convicted, but absolved of manslaughter (Stokes, 2002). Only 2% of doctors felt they had been counselled about the medicolegal implications of driving without adequate sleep by the local trust.

Powell et al (2001) reported no significant differences in reaction time, track driving performances, hits and error scores, between a sleep-deprived group

TABLE 1.
Correlation between distance travelled and falling asleep while driving

	Number (%) of doctors who have fallen asleep while driving		
Distance	Never	Occasionally	Total
<30 miles	9 (75)	3 (25)	12
>30 miles	16 (67)	8 (33)	24
Total	25 (69)	11 (31)	36

Doctors driving more than 30 miles had more episodes of sleepiness (33%) compared to those driving shorter distances (25%). This was not statistically significant (odds ratio 1.5; confidence interval 0.316–7.124)

TABLE 2.
Solutions suggested by doctors to prevent driving when tired

Suggested solution	Frequency	%
Transport home	30	54.5
Reimburse public transport	1	1.8
Post-'on-call' accommodation room	11	20
Continue current practice	6	10.9
No 'on calls'	1	1.8
Transport + reimburse public transport	1	1.8
Transport + post-'on-call' accommodation room	2	3.6
No comments	3	5.4
Total	55	100

and a alcohol-challenged group. Driving in a sleep-deprived state can be considered an offence, although there is no such clause in the Driver and Vehicle Licensing Agency (2003) booklet.

The financial implication of these issues is potentially serious. The insurers for the Selby rail crash honoured the claim, but the legal battle continues. Doctors were uncertain whether there was a clause in their insurance policy regarding driving without adequate sleep, and 10% felt their insurance companies would not pay if they had an accident while driving when tired. However, asking insurance companies showed no such clause existed, although one company was charging higher premiums for doctors. They stated that doctors make the most motoring claims, probably relating to long working hours in a stressful job (Churchill Insurance, 2002).

Possible solutions to this problem were explored. Organized transport between home and work was the most accepted solution, followed by the provision of accommodation after a night on call. The hospital in this study was a district general hospital, 40 miles from a main city. Family commitments and the need for a viable social life may be reasons for doctors feeling the need to get home after being on call. Arranging shared transport to and from the hospital for residents, who would be on call six times a month, would come to an average of £100 000 each year. Trust liability in the event of an accident would probably be less than this.

There is an analogy between the health service and the aviation industry, as both require 24-hour activity to meet operational demand. Research on fatigue, sleep, circadian physiology and shiftwork schedule has been applied to the aviation industry (Battelle Memorial Institute, 1998).

In the interest of public safety, guidelines for duty and rest scheduling in commercial aviation have been in place since 1985 and reinforced in 1996 (Dinges et al, 1996). These state that within a 24-hour period, standard cumulative flight duty should not exceed 10 hours. The duty can be extended to a maximum of 12 hours if required, but this has to be accompanied by compensatory off-duty hours. They also state that the number of duty periods impinging on the window of circadian low (a time when the body most demands sleep, usually between 3 and 4 am) without time off must be limited. Failure to meet these guidelines in the aviation industry is punished by fines from the Federal Aviation Administration. The success of this has reduced, although not eliminated, fatigue-related accidents. Similar guidelines need to be implemented within the health-care system.

Doctors working on call in smaller hospitals show reduced sleep despite less work, probably relating to apprehension or stress; this is followed by increased sleepiness the next day (Akerstedt and Gillberg, 1990).

For doctors working on a shift system, time off work is also important because the amount of actual sleep time is different from the length of off-duty hours. One study involving nursing professionals reported that at least 16 hours of off-duty time was needed between shifts to ensure 7–8 hours of sleep (Kurumatani et al, 1994).

CONCLUSION

A solution to the problem of driving after a night on call would be to change over to a shift system, which would also solve the problem of junior doctors' long working hours. Efforts to limit junior doctors' working hours through the European Working Time Directive (EWTD) is a step in that direction (Department of Health, 2003). The authors also propose that travel time should be included in doctors' maximum working hours each day, to ensure the safety of doctors and the general public on the roads. Until the EWTD is implemented, they suggest that on-call rooms should be made available for doctors to catch up on lost sleep before driving home. Similar arrangements need to be considered for other health personnel and other professionals who work long hours or shift systems.

It is critical that safety on the roads be acknowledged as a shared responsibility between health professionals (employees) and trusts (employers). HM

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KEY POINTS

- Doctors driving home after a night 'on call' are often tired because of inadequate sleep.
- One-third of doctors fall asleep while driving, even if momentarily.
- A financially feasible solution would be to change from an on-call system to a shift system.
- Travel time should be included in doctors' maximum working hours each day, to ensure the safety of doctors and the general public on the roads.
- Responsibility of driving after a night on call is personal, although only half the study group were aware of its legal implications.