

LETTER



Risk-taking in junior doctors working night shifts in intensive care

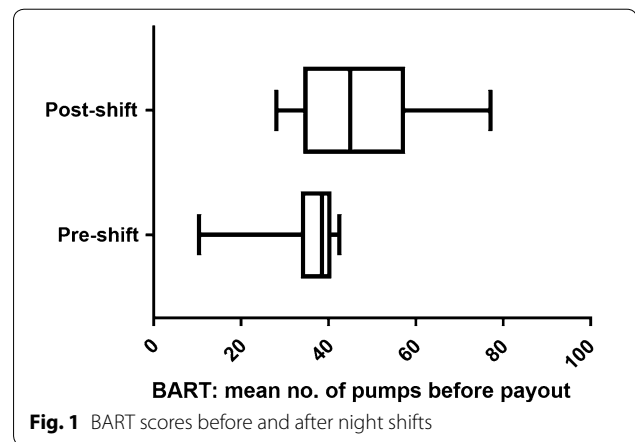
Maria Vittoria Capanna¹, Ruihua Hou¹, Matthew Garner², Ho Ming Yuen³ and Catherine M. Hill^{1,4*}

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Sleep deprivation impairs executive function, information processing, visual-spatial perception, psychomotor skills and, importantly, affects clinical performance [1]. Alternating day and night shifts causes circadian misalignment, compounding these deficits [2]. Risk-taking, although causally linked to sleep deprivation [3], has not been reported in doctors working night shifts.

We studied risk-taking in 12 healthy junior doctors (below consultant level) working 3–4 consecutive 13-h night shifts in neurological and paediatric ICUs [4]. Participants were tested at lunchtime before the first night shift and between 8.30 and 10.00 am after the last shift. Randomised testing order controlled for practice effects. Eleven participants (nine male), aged 26–36 years, completed two computerised tasks at each time point: the Balloon Analogue Risk Task (BART) and the Attention Network Task (ANT) [5]. Wilcoxon signed-rank tests in SPSS v22 (IBM Corp, Armonk, NY) and 95% confidence intervals (CI) for the difference between medians in Confidence Interval Analysis (CIA) software (version 2.2.0) were used in the analysis. The study was approved by the Faculty of Medicine Ethics Committee, University of Southampton.

Participants showed a significant increase in risk-taking on the BART (pre-shift median = 38.5, post-shift median = 45.0; difference between medians with 95% CI 11.4 (3.1–20.9); $p = 0.021$) (Fig. 1). There were no



differences in change in BART scores by gender. There was no significant change in ANT scores,¹ noteworthy as attention is sensitive to sleep deprivation, indicating that risk-taking may be particularly vulnerable to night shift exposure.

What are the professional implications of risk-taking? Junior doctors are less risk-averse than senior peers and confidence levels in decision-making remain intact during sleep deprivation [5]. Higher levels of risk-taking, without compensatory reduction in confidence, increase the likelihood of clinical error, particularly in an ICU where rapid decisions are necessary. What of the personal consequences? Of 1135 UK doctors surveyed online, 41% reported falling asleep whilst driving home after a night shift [5]. Junior doctors may suffer double jeopardy on the roads as risk-taking behaviours increase vulnerability to road traffic accidents.

*Correspondence: cmh2@soton.ac.uk

¹ Division of Clinical Experimental Sciences, Faculty of Medicine, University of Southampton, Southampton, UK
Full author information is available at the end of the article

¹ See online supplement for full description of measures and ANT data.

Risk-taking behaviour in junior doctors after ICU night shifts has potentially serious implications for professional practice and personal wellbeing, and deserves further study.

Electronic supplementary material

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Author details

¹ Division of Clinical Experimental Sciences, Faculty of Medicine, University of Southampton, Southampton, UK. ² Department of Psychology, University of Southampton, Southampton, UK. ³ Primary Care and Population Sciences, Faculty of Medicine, University of Southampton, Southampton, UK. ⁴ Paediatric Sleep Medicine, Southampton Children's Hospital, Southampton University Hospitals NHS Trust, Southampton, UK.

Compliance with ethical standards

Conflicts of interest

The authors have no conflicts of interest to declare relevant to this publication.

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References

1. Philibert I (2005) Sleep loss and performance in residents and nonphysicians: a meta-analytic examination. *Sleep* 28(11):1392–1402
2. Maltese F, Adda M, Bablon S, Hraeich S, Guervilly C, Lehingue S, Wiramus S, Leone M, Martin C, Vialet R, Thirion X, Roch A, Forel JM, Papazian L (2016) Night shift decreases cognitive performance of ICU physicians. *Intensive Care Med* 42(3):393–400
3. Womack SD, Hook JN, Reyna SH, Ramos M (2013) Sleep loss and risk-taking behavior: a review of the literature. *Behav Sleep Med* 11(5):343–359. doi:[10.1080/15402002.2012.703628](https://doi.org/10.1080/15402002.2012.703628)
4. Capanna MV, Hou R, Garner MJ, Hill CM (2016) How does sleep deprivation during night shifts affect junior doctors' cognitive performance: a pilot study. *J Sleep Res* 25(S1):155 (abstract P204)
5. Blagrove M, Akehurst L (2000) Effects of sleep loss on confidence-accuracy relationships for reasoning and eyewitness memory. *J Exp Psychol Appl* 6(1):59–73. (<http://www.ncbi.nlm.nih.gov/pubmed/10937312>)