

Doctor 'sat nav' project gives new direction for out-of-hours care

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Credit: University of Nottingham

The results of a research project run by the University of Nottingham which used the latest technology to track out-of-hours doctors have revealed significant improvements can be made to provide safer staffing levels and better patient care.

The [WayWard](#) project, led by experts from the University of Nottingham's Horizon Digital Economy Research Institute used indoor navigation technology – based on a similar principle to the 'satnav' – to study the work of medical staff in hospitals during evenings and weekends. Professor Frank Joseph from the Royal College of Physicians said: "This data gives us significant intelligence as to how we manage sick people out of hours at a time when our staffing is at it's lowest. Patient safety must be driven by data. But in addition, where staff morale is low, we can use this information to capture the imaginations of staff, make sure they are doing the right jobs, as efficiently as possible,

to give them value in their role".

The two year project examined the way in which [junior doctors](#) deal with [patient care](#)-related tasks compared to more senior colleagues. The project has demonstrated that combining data about tasks, activity and location of clinicians in hospitals provides new evidence about staffing and care out-of-hours, which in turn helps staff make decisions about delivering that service. The task and location data gathered through unobtrusive means gives information at scale but has been supported by detailed observation and interviews to give context and form a full picture of this complex workplace.

The location information was gathered via 'logger devices' worn by staff which used WiFi signals to locate them and track their movements through the [hospital](#). The data collected was combined with work logs and used to show that a large proportion of the demand on out-of-hours staff were tasks left over from daytime shifts that had not been completed. It also showed that hospital design and lack of standard ward layout means up to 13% of clinicians' time is spent searching for notes, materials or other staff.

Dr James Pinchin is an Assistant Professor in Geospatial Science at the University of Nottingham and worked on the project. He said: "Junior doctors, nurses and support workers handle a huge task load between them out-of-hours, so collecting information about how they manage the workload is difficult. Traditional 'shadowing' is expensive, time-consuming and provides only a glimpse of what's going on day-to-day. Using the latest technology we developed a reliable, unobtrusive method to reliably track the clinicians. The results of this research will be used to make recommendations on how improvements can be made to reduce doctor fatigue and improve efficiency, which will in turn improve patient care."

The researchers worked on the project in partnership with Nottingham University Hospitals NHS Trust at their City Hospital and Queen's Medical Centre campuses and with Aintree University Hospital NHS Foundation Trust in Liverpool.

The project made use of data gathered from the award-winning Hospital at Night system, which has replaced the traditional doctor paging in Nottingham. The system, which was devised by University of Nottingham academics working in the Division of Respiratory Medicine, uses wireless smart devices to log requested tasks and tracks when jobs have been completed. It also improves the quality and accuracy of handovers between doctors. Research into its effectiveness found it led to a 70% drop in 'adverse incidents' at Nottingham City Hospital over a six month period.

Professor Dominick Shaw from the School of Medicine at the University of Nottingham said: "WayWard, which uses an indoor navigation system to allow us to study the work of doctors within hospitals, is a great example of using new technologies to improve service delivery within the NHS. The potential implications of these digital technologies are very exciting and have the ability to shape the way we provide future hospital care."

The research findings are already having an impact and have been incorporated into the Royal College of Physicians Safe Staffing Guidelines as part of their Future Hospital Programme. Professor Frank Joseph said: "The data produced by WayWard ticks every single box – it focusses on patient care, it supports professionalism and can address staff morale, and it can be used for improved training of future [staff](#). I am very proud that the Royal College of Physicians worked with WayWard on this important [project](#)."

More information: John D Blakey et al. Multimodal observational

assessment of quality and productivity benefits from the implementation of wireless technology for out of hours working, *BMJ Open* (2012). [DOI: 10.1136/bmjopen-2011-000701](https://doi.org/10.1136/bmjopen-2011-000701)

Provided by University of Nottingham

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