

POTTS, H.W.W., JONES, M., WILLIAMS, V., MORRISON, Z. and PORTER, A. 2017. A new ERA? Electronic records in ambulances: a research programme. *Ambulance today* [online], 14(1), pages 33-35. Available from: <https://ambulancetoday.co.uk/ambulance-today-archive/>

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2017

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A new ERA? Researching the use of Electronic Patient Records Systems in Ambulances

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Ambulance services around the world have been introducing electronic patient record systems. If your trust hasn't yet, it's only a matter of time. The business cases for these new systems promise the triple aim of better health, better healthcare and lower cost.

In order to support the continued shift to out of hospital care, ambulance clinicians need to be able to decide which patients will benefit from being left at home, refer to alternative care providers, and ensure that appropriate patient information is passed on to them. Technology can help in a number of ways. Firstly, apps and referral tools can aid decision-making at the scene. Secondly, technology can facilitate the transfer of patient information to ambulance clinicians at the scene or even before arrival, e.g. by sharing information on past contacts with a GP, or on a DNACPR directive. Thirdly, it can support real time remote sharing of information so that, for example, an ED consultant can advise about the appropriate conveyance and care decisions while the patient is still at home. Fourthly, it can support the easy transfer of patient information to other care providers like GPs. Finally, electronic records can make data more readily available for audit, research and evaluation (Morrison *et al.*, 2014). Data can be used in future research to inform service improvements, as well as providing ambulance services with a valuable store of information to run automated clinical and management reports, as well as defending against medico-legal action.

But is it that easy to introduce electronic records and reap such benefits? Elsewhere in healthcare, grand proposals for digitisation promised much, but didn't always deliver (Greenhalgh *et al.*, 2009). The much-vaunted National Programme for IT cost £12.4 billion yet failed to deliver its central aim (House of Commons Committee of Public Accounts, 2013; Wachter, 2016). Further back, the failure of an electronic dispatch system for the London Ambulance Service has become a classic case study of a failed implementation (Finkelstein, 1993).

In February 2016, NHS England announced £4.2 billion to digitise health care. This investment, it has again been promised, will deliver better care for less money. Perhaps this time the NHS can get it right. The recent Wachter review (2016) *Making IT Work* is a sensible starting point, warning that digitising healthcare is not easy and not cheap (it already warns that the new money is insufficient). We write as enthusiasts for technology in healthcare, but introducing new systems and getting the best out of them is far from straightforward, and can go very wrong. Whether implementations go right or wrong, we can learn from what happened. That is what we're aiming to do in a new project studying the adoption of electronic records in ambulances across the UK, funded by the National Institute for Health Research.

One of the lessons of the past is to not just focus on the technology. To get the best out of new systems, you need to think about service re-design. Although we're looking at technology, we're interested in people. We cannot divorce the technology from the many issues in paramedic practice today: role changes and personnel upskilling, increasing non-conveyance decisions, medico-legal threats,



The new Electronic Care System being introduced across South Western Ambulance Service.

and so on. Our approach is to consider a network of actors and technology: we need to understand what is going on from how usable a new piece of tech is out in the field, up to how an organisation uses the data collected. Wachter warns of the "productivity paradox": the benefits of IT often take many years to be realised. This is because successful implementations require sustained engagement between stakeholders who need to work together on shaping the technology and how it is used. Anecdotal reports from some UK ambulance trusts support the idea that benefits can take time

Biography: Dr Alison Porter



Alison Porter is Associate Professor in Health Services Research at Swansea University Medical School, and leads the study ERA - Electronic Records in Ambulances. She is primarily a qualitative researcher and often collaborates on mixed methods studies.

She is interested in organisational aspects of health care delivery, including decision making and attitudes to risk in healthcare interactions, and the implementation of technology, and has a particular interest in prehospital emergency care. Alison previously worked at the think-tank the Nuffield Trust, and before that was at the sharp end of service delivery in social care.

Biography: Dr Henry Potts



Dr Henry Potts is a Senior Lecturer in the UCL Institute of Health Informatics. He did a psychology PhD at King's College London, but re-trained and initially worked as a medical statistician.

After post-doctoral positions in the UCL School of Public Policy and at St Thomas' Hospital, he became a lecturer in health informatics at UCL. His work is focused on socio-technical aspects of digital health, understanding how both healthcare professionals and patients make use of varied technologies. However, his prior experience of ambulances has been limited to being a patient's relative.

to emerge, but may be different to what was anticipated.

There is almost nothing in the Wachter review about pre-hospital care, although NHS England's response to the review touted real-time video links in ambulances as an example technology (NHS England, 2016). But we've begun our research by reviewing the literature on digitisation in ambulances.

One challenge with electronic records is data entry. Hill et al. (2013) found doctors in a US emergency department spent on average 43% of their shift on data entry and approached 4000 mouse clicks per 10-hour shift. Paramedics are more likely to be using tablets, but the weight of data entry is just as significant. US (Landman et al., 2012) and Finnish studies (Kuisma et al., 2009) found call durations can, at least initially, increase with electronic record systems taking longer to fill out.

An alternative is to have technology that directly records outcomes, yet achieving this is not straightforward. For example, public access automated external defibrillators collect clinically useful data when used, but this is often not collected, with a lack of standardisation in both hardware and software as barriers (Lim Choi Keung et al., 2016).

But generally electronic record systems mean we have more data and can do more with it. The benefits of data may come immediately, a warning that a patient's blood pressure is dropping, or take much longer, an analysis of data collected over many years, aggregated across different regions, to then input into a new treatment guideline. If there



Mark Yates, Advanced Technician, uses the new Electronic Care System being introduced across South Western Ambulance Service.

is too much disconnect between the person doing the data entry and the person using or benefitting from the data, it is no surprise if data completeness and quality suffer.

Not all staff find moving to an electronic record system easy. In a small US study, paramedics with more years in service tended to find the transition harder (Baird & Boak, 2016), although attitudes to and familiarity with computers may be the underlying factors at play (Colligan et al., 2015).

In our research, we plan to talk to all the ambulance trusts in the UK to understand how far advanced electronic records and other digitisation plans are. We are then focusing on four case studies of trusts at different stages of adoption. Our team, including research paramedics, are going to be out in the field observing the use of new technologies in real situations, and talking to staff in ambulance trusts and other health care partners about the potential – and possible pitfalls – of electronic records. We want to know how ambulance trusts can maximise the value of electronic records in providing safe, appropriate care to patients.

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The ERA (Electronic Records in Ambulances) project is funded by the National Institute for Health Research HS&DR programme (project number 14/17/22). The views and opinions expressed here are those of the authors and do not necessarily reflect those of the HS&DR programme, NIHR, NHS or the Department of Health.

Ambulance Today would like to thank Ortivus and South Western Ambulance Service NHS Foundation Trust for their kind permission for use of photos.

