The technological ward round: Discuss the benefits and

challenges posed by paperless systems within the NHS.

Should drugs charts, NEWS scores and patient notes all be

transferred onto tablets?

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The Unofficial Guide to Medicine Essay Competition

Smart Era & Electronic Health Records

In 1911 Frederick Taylor published his monograph – *The Principles of Scientific Management* – establishing his approach to improving industrial efficiency. As the publically funded National Health Service (NHS) continues to succumb to unsustainable pressure, it is arguable that Taylorian principles remain the cornerstone for developing viable guidelines and practices. A promising spearhead in the rally towards economic and service efficiency is the integration of Information Technology (IT) into NHS trusts. This movement is reflected in the NHS *Five Year Forward View*[1], which commits to the connection of Electronic Health Records (EHRs) across primary, secondary and social care by 2020 – with a view towards 'largely paperless patient records'. EHRs are a digital version of a patient's paper health record with the capability of being shared across multiple health care organisations.[2]

The transition towards EHRs has skewed the equilibrium of data from traditional and structured to novel and unstructured. By virtue of its format, unstructured data imposes the need for IT devices in a way that may threaten the ritualistic ward round ubiquitous on wards today. The emergence of smart tablets, such as the Apple iPad, has satisfied a niche market by compromising between the diminutive screen size and battery life of a personal digital assistant[3], the bulkiness of a laptop, and the immobility of a desktop. But does a paperless system provide the future of healthcare provision, and how would clinicians and patients receive one?

Inefficient for Tradition's Sake

A traditional ward round is readily identified by the cumbersome trail of staff led by a consultant and tailed by a wide-eyed medical student. Within this fragmented framework, several tasks are performed with the potential to lengthen ward rounds whilst shortening patient interaction. Amongst these tasks are chasing patient investigations and searching for 'wandering' notes – factors that are often unaccounted for despite the preparatory guidance by the *Royal College of Physicians*.[4] This lost time is illustrated by *Patel et al*[5] who found that ≈41% of consultation time was spent finding results, being disturbed, or through administration. They also reported that time with the patient had decreased by 2.8 minutes from 1988 to 2001. Several studies[6-8] have shown longer patient-physician interactions result in greater patient satisfaction, meaning the traditional paper ward round may undermine patient care at a fundamental level – and that's where tablets come in.

A Smarter Ward Round

The ability of tablets to collaborate multiple sources of information into one neat EHR could improve the efficiency of ward rounds. This theory was investigated by *Fleischmann et al*[9] who found the use of an Apple iPad Mini on 164 ward rounds decreased the time spent looking up results by 0.8 minutes whilst increasing physician time spent at the bedside by 1.4 minutes (Figure 1). These seemingly mild improvements, when extrapolated to the paradigm of a

25-bedded ward, would translate to an additional 35 minutes interacting with patients whilst unlocking an extra 20 minutes otherwise spent chasing results.
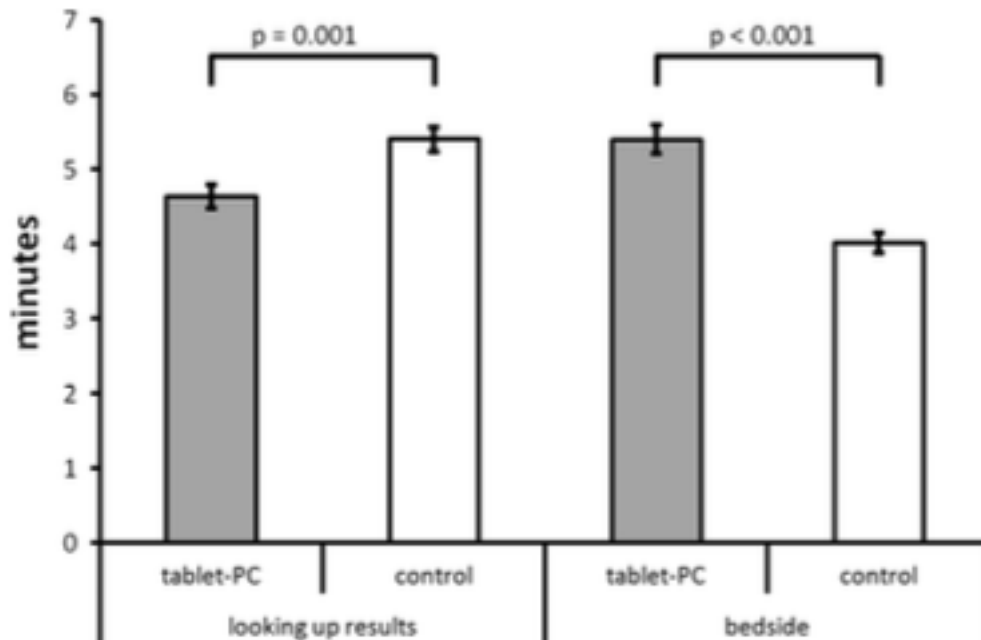

Figure 1. Time required to perform work processes on ward rounds with and without the use of a tablet. Taken from *Fleischmann et al*[9]

The evolving market appeal of smart devices may have an impact on the perception of patients to the use of tablets during ward rounds. It is estimated that 68% of UK adults own, or have ready access to, a tablet whilst as many as 65% of grandparents are thought to own a smartphone as of 2017.[10] These figures are increasingly salient as the aging world population contributes to an ever-maturing ward demographic. *Baysari et al*[11] observed the impact of an iPad on the doctor-patient relationship and found that 63% of patients felt 'very' or 'somewhat' engaged in their care process. A doctor within this study summed up the use of an iPad on ward rounds as follows:

"the iPad for many of the patients is a familiar and kind of fun device for them to use and it is easier for them to see the iPad than the mobile laptop"

The social dynamics of ward rounds have traditionally facilitated conversation amongst its members to overcome the challenges of planning patient care. Evolution from paternalistic medicine has seen the patient become fundamental in these discussions and, more recently, computers are playing an increasing role. By providing a single focal point, as opposed to multiple paper records, computers are likely to affect the way in which practitioners interact with each other and with their patients. *Morrison et al*[12] demonstrated this effect by reporting a loss of group formation and posture with the use of a computer on wheels. As a result, they concluded the consultant lost his ability to direct the conversation whilst other practitioners had difficulty participating in the ward round. Properly positioned tablets could avert these social inadequacies by allowing members to maintain eye contact and participation, whilst patients engage readily with results and management plans. *Baysari et al*[11] found that the majority of interactions, however, were done so with the iPad screen facing away from the patient. An oversight like this could threaten the benefits of tablet use by fostering a malevolent doctor-patient relationship, particularly in those with mental health co-morbidities.

Dissemination of information throughout a hospital is critical for patient care. A single piece of paper fails to conduce efficient circulation of information when needed by a nurse on the ward whilst it is at the pharmacy on the other side of the hospital. The ability of tablets to transgress the hospital grounds, and

broadcast information to multiple users separated by time and space, could reduce transcription error and labour (Figure 2). This potential is, however, dependent on staff acceptance and usage. Barriers to acceptance include a lack of user-friendly software and backup protocols if EHR systems fail.[13] Concerns regarding infection control and security, due to the portability of tablets, have also been raised.[14] By improving acceptance to a paperless system, usage will naturally follow suit, and so every effort should be made to improve user experience when introducing a clinical model. These efforts may include training modules worth continuing professional development points to maximise attendance by busy hospital staff. Other approaches may include a step-by-step user manual, or even a designated 'tablet champion' on each ward.
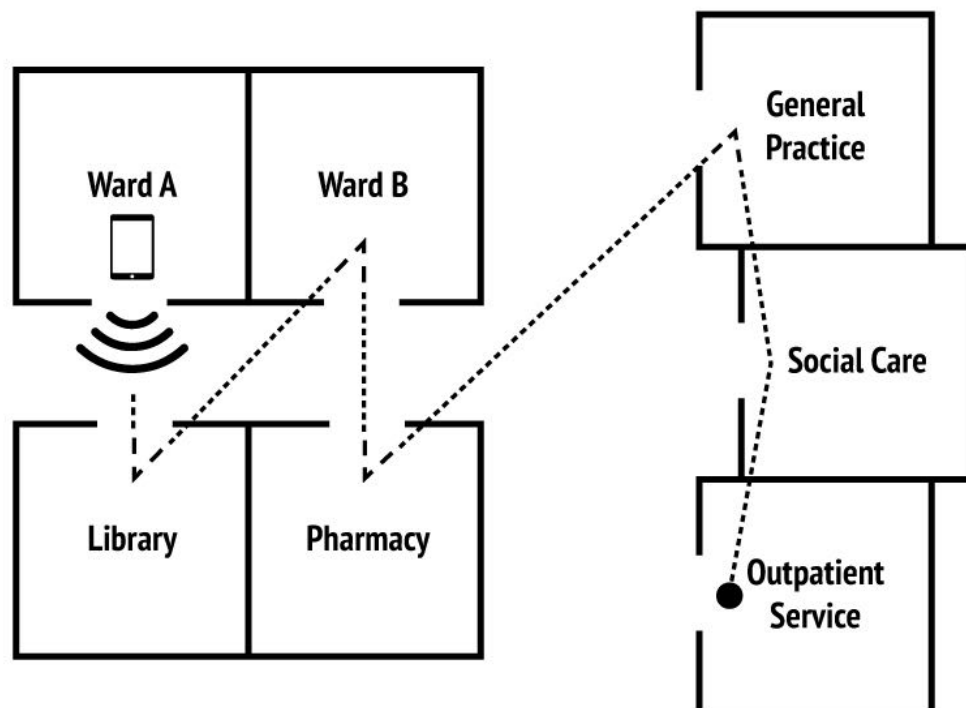

Figure 2. Schematic representation of distribution of electronic patient information using tablets across primary, secondary and social care

Confidentiality

Knowledge is power, and so concerns over patient confidentiality are well recorded in the literature. These concerns have evolved from misplacing patient documents to emailing personal information using an unencrypted service. Nevertheless, patient confidentiality remains paramount – particularly as paper archives become increasingly redundant in an NHS that is proven vulnerable to cyber attack and ransom.[15] The exponential increase in electronic information catalysed by EHRs and tablets only deepens the importance of confidentiality, with local threats compounded by distant ones. The principles established in the Caldicott guidelines and Data Protection Act remain relevant in protecting electronic patient information, albeit some revisions may be required. Simple safeguards, such as ensuring account logout and device standby, should be reinforced to all users when introducing tablet use clinically. Further eLearning modules could also be made available to continue education of data protection once tablets are established on the wards. If the 'technological ward round' is adopted by the NHS, these bolus efforts could be supported by basal interventions targeting students, such as tablet data handling exams, to introduce digital confidentiality to the next generation of healthcare professionals.

Future of Tablets in the NHS

Movement towards EHRs, and incorporation of IT devices onto the ward, is inevitable. The role of tablets within this certainty is, however, far from a

formality. Research has shown the use of tablets on ward rounds to improve time efficiency and patient interaction, but at what expense? The ceremonial ward round of today, where multi-disciplinary teams reassuringly flex their authority in front of patients, may fall victim to a technological ward round with previously humanistic jobs replaced by apathetic mechanisms. This balance between pros and cons has seemingly divided the acceptance of healthcare professionals to tablet use in a way that threatens their functionality. Bit part usage could see tablets hinder rather than help clinicians on ward rounds by disrupting established systems, and confusing staff that are on the fence.

The role of tablets in a hypothesised healthcare utopia remains conceivable with universal acceptance. Proper education and training for allied staff could yield a smart ward round where patient notes, observations, drug charts, imaging, and investigation results are available at the touch of a button. Families could remotely monitor progress of their loved ones on an appropriately amended platform. Registrars could seek the advice of their responsible consultant without worrying about making them leave home unnecessarily. The possibilities are extensive, but further research into the efficacy of tablets within different healthcare systems must be conducted to explore their potential, and facilitate institutional change.

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