Digital Transformation of Clinical Care

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Patient-friendly & Smarter Healthcare
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Outline

• Digital transformation for clinicians

• Challenges for clinicians and literature review

• Digitally transformed care: real world examples
Digital Healthcare is Queensland’s Future

- Currently 20% of Queensland hospital patients looked after on a digital platform
- Will be more than ¼ by end of the year
- Within 2 years almost all Queensland hospital patients will be in digital hospitals
Going digital: a narrative overview of the clinical and organisational impacts of eHealth technologies in hospital practice

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Abstract

Objective. The aim of the present study was to determine the effects of hospital-based eHealth technologies on quality, safety and efficiency of care and clinical outcomes.

Methods. Systematic reviews and reviews of systematic reviews of eHealth technologies published in PubMed/Medline/Cochrane Library between January 2010 and October 2015 were evaluated. Reviews of implementation issues, non-hospital settings or remote care or patient-focused technologies were excluded from analysis. Methodological quality was assessed using a validated appraisal tool. Outcome measures were benefits and harms relating to electronic medical records (EMRs), computerised physician order entry (CPOE), electronic prescribing (ePrescribing) and computerised decision support systems (CDSS). Results are presented as a narrative overview given marked study heterogeneity.

Results. Nineteen systematic reviews and two reviews of systematic reviews were included from 1,197 abstracts, nine rated as high quality. For EMR functions, there was moderate-quality evidence of reduced hospitalisations and length of stay and low-quality evidence of improved organisational efficiency, greater accuracy of information and reduced documentation and process turnaround times. For CPOE functions, there was moderate-quality evidence of reductions in turnaround times and resource utilisation. For ePrescribing, there was moderate-quality evidence of substantially fewer medications errors and adverse drug events, greater guideline adherence, improved disease control and decreased dispensing turnaround times. For CDSS, there was moderate-quality evidence of increased use of preventive care and drug interaction reminders and alerts, increased use of diagnostic aids, more appropriate test ordering with fewer tests per patient, greater guideline adherence, improved processes of care and less disease morbidity. There was conflicting evidence regarding effects on inpatient mortality and overall costs. Reported harms were alert fatigue, increased technology interaction time, creation of disruptive workflows and new prescribing errors.

Conclusion. eHealth technologies in hospital settings appear to improve efficiency and appropriateness of care,
• E-health technologies confer benefits in improving quality and safety of care with little evidence of major hazards.
Title
The impacts of eHealth upon hospital practice: synthesis of the current literature

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What is a Queensland Digital Hospital?

- Structured clinical notes
- Emergency Department
- Surgery and Theatres
- All inpatient & Outpatient areas
- Pathology and Radiology orders and results
- Radiology
- Medications Management
- Scheduling – Outpatients and Elective Surgery
- Device integration
- Closed loop observations
- Managing deteriorating patients workflow
- Positive person identification
Pioneering digital disruption: Australia's first integrated digital tertiary hospital

Digital transformation has started in Australian hospitals

Digital technology now underpins most industries; however, the health care sector (particularly in hospitals) has been slow to transform from traditional paper-based systems of care. In the United States, for example, federal legislation and financial incentives have facilitated the implementation of electronic medical records (EMRs); but there are only a handful of advanced EMRs in hospitals outside the US. The roll-out of a digital hospital includes an EMR system and other technical components, such as integrated digital vital sign monitoring and digital electrocardiogram (ECG) records. This transformation prompts revolutionary change in the way health care is delivered and monitored.

The enthusiasm for digital transformation in health has...
Inpatient mortality before and after digital hospital implementation

Crude death rate (% occupied bed days)

EMR Implemented

Time

CHALLENGES FOR CLINICIANS
Digital Disruption

• Digital disruption is defined as the changes facilitated by digital technologies that occur at a pace and magnitude that disrupt established ways of value creation, social interactions, doing business and, more generally, our thinking.

• Clinicians asked to change the way they have delivered care for decades often with world leading outcomes
Digital disruption ‘syndromes’ in a hospital: important considerations for the quality and safety of patient care during rapid digital transformation

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Abstract. The digital transformation of hospitals in Australia is occurring rapidly in order to facilitate innovation and improve efficiency. Rapid transformation can cause temporary disruption of hospital workflows and staff as processes are adapted to the new digital workflows. The aim of this paper is to outline various types of digital disruption and some strategies for effective management. A large tertiary university hospital recently underwent a rapid, successful roll-out of an integrated electronic medical record (EMR). We observed this transformation and propose several digital disruption “syndromes” to assist with understanding and management during digital transformation: digital deceleration, digital transparency, digital hypervigilance, data discordance, digital chum and post-digital ‘depression’. These ‘syndromes’ are defined and discussed in detail. Successful management of this temporary digital disruption is important to ensure a successful transition to a digital platform.
WHY?
What is the point of the digital hospital?

• Not to just put in an IT system
• Not to replace paper with electronic paper
• To improve the quality and efficiency of care
  – Better care for individual patients
  – Better care for groups of patients
  – New and innovative models of care
Digital Transformation Strategy

Horizon one
- Better access to information
- Decision support
- Establish clinical governance

Horizon two
- Data to improve quality and efficiency of care
- Increasing reliability
- Reducing variation

Horizon three
- Analytics for quality improvement
- Personalised medicine
- Predictive and prescriptive analytics

2016
2020
2026
DASH Examples

• Deteriorating Patient Management
• Inpatient insulin management - Digital Diabetes (3D)
• IV Heparin Infusion Management (HIVE)
• At-risk Emergency Department patients (ED RealTime)
• Hospital acquired IV line infections
Operational Decision Making
Quality and Safety
Quality and Safety
### Metro South Health

#### Standard 4: Medication Safety

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Informed Clinicians

3D- Digital Diabetes

3D - Digital Diabetes Dashboard

All Insulin Orders

- Patients
- Completed
- Discontinued
- Cancelled
- Deleted
- Pending
- Validated
- Total
- %

Patients with Insulin Administered

- 100 Patients with IV Insulin Administered
- 50 Patients with Glucagon Administered
- 10 Patients with Glucose Monitored
- 20 Patients with Insulin Order

Patients with Blood Glucose Monitor

- 10 Patients with Insulin with BGL Results per R

Informed Clinicians | Digital Diabetes | 3D - Digital Diabetes Dashboard | 28
Digitally Augmented Support for High Risk Care (DASH)

• Data alone is useless and information only half the story
• A combination of technical support, clinical redesign and quality monitoring is needed to facilitate rapid cycle iterative improvement
DASH Components

1. High risk clinical situation amenable to intervention

2. Clinically validated data available to clinicians in near real time

3. Multi-layered dynamic display allowing individual patient identification

4. Designated clinical owner

5. Support for treating teams
Digital Transformation

• This is true transformation: having data on the care of our patients available in real time
• We can choose to act on that data to improve care
• New way of working: over time, new and innovative models of care will emerge
Conclusion