The challenges of using technology in a busy Emergency Department: a case study of a next generation ED management information system

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Background

- Potential of ICT to improve delivery of care
- Uptake of information systems low despite purported benefits
- Staff resistance cited as key barrier to organisational adoption of new technology

Cerner Millennium

- Commercially-available package of healthcare information solutions developed in the US
- To be rolled out state-wide in NSW
- No studies of system impact in the context within which care is being delivered

Aim

To explore the general functionalities of an ED management information system and the impacts of its recent implementation as perceived by ED doctors and nurses at one hospital

The Study

- Case study approach
- 650-bed Australian metropolitan public teaching hospital
- 20 interviews
- - 11 doctors
- - 7 nurses
- 2 non-participant observations
- *FirstNet* in place for less than three months prior to the date of study
- Replaced the Emergency Department Information System (EDIS)

Results - *FirstNet*

- ED information system designed for management of department
- Provides view of patient status and location within the ED.
- Tracking of patient movement
- Audit trail of all activities undertaken within the electronic patient record

Results - FirstNet

- Triage
- Waiting Room
- Admit
- All Beds
- Provider
- Nurse
- Doctor
- Consult
- All Patients
- Subacute
- Acute
- Whiteboard

FirstNet “All Patients”

Tracking List

All Patients | All Beds | Ad Hoc | Triage | WR | Acute | Subacute | Registration | Admit | Provider | Nurse | Doctor | Consult | Fast Track | Whiteboard | Pending Discharge | Clerk Admit | Re

All patients (56/56)

Quick Filter: No Filters applied

Bed	MRN	Name	Age/S	T	Dr	NR	AP	Presentation	LOS	Events	Patient Care	Comment	FT	A	Lab	DS	Admit Comment	Alloc W
Resus,01			2 w	1		amand		Diarrhoea	268:49						8/0			
Waiting Rr			7 ye	1				Bite/sting	339:29									
Resus,05				1				HEAD INJURY	1509:43						8/0			
Acute,17			27 ye	2	Binay	Laura I		CHEST PAIN	1511:51			Intermediate risk			16/8			
Waiting Rr			63 ye	2				Pain, chest	462:50									
Acute,06			3 w	2				Abnormal results	268:49									
Acute,05			66 ye	3				CONFUSION	1516:24			PFN			20/7		Admit Dr Macarthur with dementia, diabetic diet	
Cube2,01			35 ye	3	Shanu			Abdominal Pain	1516:08			surg reg			7/6			
Waiting Rr			71 ye	3	Noor E			BLURR RIGHT EYE	1515:51			AWBR			5/0			
Acute,12			79 ye	3	Mary	Karla A		Unwell	1516:41			pfn					Admit Dr Fulham Adenocarcinoma	3W
Acute,01			83 ye	3				ABDO PAIN	1517:18						9/8			
Acute,23			28 ye	3		amand		Wheeze	268:49									
Acute,07			47 ye	3	Margie	Gauri		AGRESSION	1514:26			MH HDU					Admit Dr Vadalli, dellusional disorder, normal diet	
Paeds,01			5 ye	3	Noor E	Karla A		fever cough	1514:24			a/w CXR						
Acute,09			43 ye	3	Justin	Gauri		EPILEPSY	1514:23									
Acute,20			51 ye	3	Margie	Meliss		generally unwell	1514:18			med reg			9/6			
Acute,03			22 ye	3	Kay			RIF PAIN	1514:05								ADMIT / CLARKE	
Acute,14			84 ye	3	Annali			DIZZYNESS	1513:45						8/7			
Obs,01			25 ye	3	Annali			SEIZURE	1513:43			**********					Admit under Dr Sheridan with seizures, normal diet	
Acute,10			69 ye	3	Margie	Gauri		SOB	1519:13			Await CT results			10/6		Admit Dr Clarke Diverticulitis	
Acute,15			70 ye	3	Margie	Laura I		Unwell	1513:24			Med Reg			13/11			

Clinician perceptions

- Complexity of system decreased workflow efficiency by increasing administrative workload of clinicians

…to allocate [a] patient to me I need to go into the Nurse button on the screen. I need to do "Protocol Commenced", I need to cancel the doctor examination and cancel the nursing examination before I can take the patient from the doctor waiting list & allocate them to myself…I actually have to go through four steps before I can allocate a patient to myself before I can go and see them… it's not, particularly user friendly – it's made a process much more complicated than it's meant to be…[ED transitional nurse practitioner]

Perceptions Cont'd

- Integration of clerical and clinical features advantageous for clerical staff but redundant for clinicians

…the concept's good but it just needs to be done better…we just need something simple… [there are] a lot of features that people don't use and that makes the system very complicated like all these columns I don't even know what they are (refers to view of FirstNet on laptop)…there's about …20 columns on the screen and no one knows what they are, no one uses them…[ED Physician]

Perceptions Cont'd

- *Security and activity tracking features for increased provider accountability and patient safety resulted in process duplication and redundancy*

…it's very cumbersome…you have to fill in multiple different fields and sign your signature multiple times and there's doubling up… [ED physician]

Perceptions Cont'd

- "Turning doctors into typists"
- Less time spent with patient due to increased time spent interacting with computer
- Sharing of patient information between systems negated need to access multiple systems for a complete patient profile
- Improved patient tracking

Implications

- Context of care delivery not reflected in system design
- Need for sociotechnical approach to systems design and implementation
  - Focus on the interrelation between technology and its social environment (Berg et al., 2003)
- Increased focus tracking of service utilisation and quality of care indicators, provider accountability and security

Conclusions

- Sociotechnical approach to system design calls for clinician participation in system customisation
- Balance between security and accountability features with usability

Questions?