Improving Patient Health Outcomes in Acute Care Hospital Settings Using Mobile Wireless Technology and Handheld Computers

Research Team

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Project Outline

Investigate the use of wireless technology and PDAs by nurses in two acute care units within Southern Health and Royal Women's Hospital

Aims

➢Impact of the use of PDAs in improving patient outcomes.

➢How nurses have embraced using the new devices and difficulties they may have encountered.

Southern Health

➢ Dandenong Hospital is a part of Southern Health which is the largest provider of health care services in Victoria Australia.

➢ Southern Health provides services from more than 35 sites, including 6 main hospital sites and 25 primary care sites across the south east suburbs of Melbourne.

➢ Intensive Care unit at Dandenong Hospital is a 14 bed ICU/HDU unit which was relocated to a new unit in 2005.

Southern Health

➢ Employs approximately 100 Nursing and Medical staff. The unit specialises in major abdominal, vascular and plastic surgical patients.

➢ Service rest of the hospital with a Medical Emergency team and an outreach team.

➢ The unit educates an average of approximately 50 ug/pg students per year and participates in medical and nursing research projects.

➢ The new ICU has the facilities to treat 1000 critically ill surgical and medical patients per year

Intensive Care Unit Dandenong

The Royal Women's Hospital Oncology-Dysplasia Unit |

➢ The Royal Women's Hospital is Australia's largest specialist hospital dedicated to improving the health of women of all ages and cultures, and newborn babies.

➢ The Royal Women's Hospital provides an integrated inpatient/outpatient oncology service for women with benign, pre-malignant and malignant conditions.

➢ Patients of the Women's oncology unit are mostly women with diagnosed, or suspected, gynaecological or breast cancer who may be treated here at any stage of their illness.

The Royal Women's Hospital Oncology-Dysplasia Unit

➢ Services include both major and minor surgery, chemotherapy, oncology and dysplasia outpatient clinics and a range of support programs and groups.

➢ Operates as a multi-disciplinary team, which includes nursing and medical staff, physiotherapy, social work, pharmacy, dietetics and pastoral care.

➢ Gynaecological cancers include ovarian, cervical, endometrial, primary peritoneal and fallopian tube.

Oncology-Dysplasia Unit Cases Treated

JANUARY TO JUNE 2006

- ➢ **Total Number Surgical Cases - 165**
- ➢ **Major Cases - 128**
- ➢ **Minor Cases - 37**
- ➢ **Malignant Cases - 74/165 (45%)**
- ➢ **Benign Cases - 91/165 (55%)**

JULY - DECEMBER 2006

- ➢ **Total Number Surgical Cases - 186**
- ➢ **Major Cases - 140**
- ➢ **Minor Cases - 46**
- ➢ **Malignant Cases - 100 (54%)**
- ➢ **Benign Cases - 86 (46%)**

Background

➤PDAs are emerging as technologies that can improve patient safely and quality of care.

➤The estimated cost of adverse events in Australia is approximately $2 billion per year whereas in the United States medical errors are estimated to cost $38 billion per year, with $17 billion of those costs associated with preventable errors.

Advantages of PDAs

➢ Portable.

➢ Integrated platform for point-of care clinical reference, patient management and data communication.

➢ Clinical reference programs obtained from Internet and guidelines.

➢ Patient management programs allow healthcare professionals to access and store clinical information.

Advantages of PDAs

➢ Rapid exchange of clinical laboratory results and *efficient patient handovers* through wireless technology.

➢ Point-of-care data collection to enhance quality assessment and outcomes in healthcare organisations.

➢ Patient education and interaction to prevent and manage diseases such as obesity, diabetes, asthma, cancer or urticaria.

➢ Data collection and processing in research.

Disadvantages of PDAs

➢ Security, patient confidentiality and different system interfaces must be protected when implementing PDAs.

➢ Other limitations include an inability to handle large graphics programs and complete electronic medical records.

➢ The cost of the devices and initial training are significant disadvantages that may act as barriers to implementation of the devices into new areas The relatively small size of handheld computers means they can be easily lost or stolen.

➢ The short life expectancy due to rapid technological development

PDAs have the potential to:

➢ Reduce medication errors, including errors that can cause patient's harm.

➢ Increase appropriate and safe prescribing decisions by providing information about suggested drug dosages and frequency of doses.

➢ Improve the quality of medical and nursing care by providing clinicians with ever-changing management guidelines and care standards.

PDAs have the potential to:

➢ Contribute to patient education, practice audit and clinical outcome analysis by providing the opportunity to use data to review clinical practice patterns, for medication and tests ordered for specific patient groups.

➢ Reduce physician and nursing time spent on administrative tasks thereby improving efficiency of care to the patient.

➢ Reduce costs mainly related to less expensive tests and drugs, and fewer medication errors and adverse drug events.

Research Questions

1. Does the use of wireless PDAs provide point of care information and decision support systems for nurses?

2. Does the use of wireless PDAs assist the nurses in detecting or preventing adverse events?

3. What factors influence implementation of the wireless PDAs by nurse in the clinical units?

Methods

➢ Both quantitative and qualitative methods are being used to examine the use of wireless PDAs by nurses in the clinical area to improve patient health outcomes.

➢ The quantitative method is quasi-experimental, using a non-equivalent experimental group design, to provide data to measure the effectiveness of PDAs in improving patient safety and quality care outcomes to address research questions 1 and 2

➢ The qualitative methods will conduct focus group discussions to ascertain how the nurses have embraced using the PDAs and the difficulties they may have encountered to address research question 3.

Participants

- The nurses, working in the clinical units chosen for the experimental and comparison groups, have been purposively selected to participate in the project.

- They are working at the Royal Women's Hospital and the Dandenong hospital within Southern Health

- PDAs will be provided for all nurses on each shift, am, pm, night duty.

Equipment

➢ HP PDAs 2490 has been chosen as the preferred PDA device

➢ Units have been wirelessed

➢ PDAs have communication function so that nurses can either text or speak to one another from rooms within unit

➢ MIMS for PDAs (Australian pharmacological data base) has been preloaded on PDAs

➢ Specific procedures, clinical protocols etc to both units have been preloaded on PDAs

Measures

➢ Demographic data will be gathered on the nurses who participate and will include information such as age, sex, qualifications, length of service, and previous experience in the use of IT.

➢ The data measures will be collected at pretests and posttests to determine if the use of PDAs has improved patient outcomes. Include

Patient Satisfaction Survey Database provides regular, ongoing monitoring and reporting of patient satisfaction in key areas of service delivery. The survey is mailed out to the patients 4-6 weeks after discharge from the hospital.

Measures

RiskMan® Medical Incident Reporting Database captures and classifies details of adverse incidents that occur within Victorian hospitals. The Incident Entry screen groups identify five main groups: *Who was involved*; *When Did The Incident Happen*; *What Happened, How Is The Incident Classified; Other Information*. This study will only look at incident identification/classification that relates to patient safety and quality of care. Some examples are Treatment Medication and IV related, Psychological Trauma/Other and Treatment Complications.

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Progress to date

Development, Protesting, and Revised use of PDAs

➢ Wireless quotes have been obtained and approved, and installation of the infrastructure has been completed at the RWH. Dandenong ICU is in the completion stage.

➢ A test PDA, purposefully configured for the purposes of the study has been tested at the RWH.

➢ Negotiations are in HP to purchase the PDAs and associated equipment required for the study at the best possible price.

Progress to Date

Collaboration with Charge Nurses

➢ RMIT University and the charge nurse in the Oncology ward at both hospitals have discussed and detailed the transferring of some of the nurses' paperwork into electronic format for PDA use. Include drug protocols etc

➢ The patient assessments and care maps are suitable for these purposes and are in the process of being converted to a format suitable for the PDAs.

➢ Training sessions for nurses in use of PDAs.

Progress to Date

Collection of Pre Data

➢ This will take place once all devices have been configured and training sessions completed.

➢ Research associate in collaboration with staff from the hospitals will collect this data from the Patient Satisfaction Survey and RiskMan® Medical Incident Reporting databases.

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