Use of an electronic drug monitoring system for ambulatory patients with chronic disease: How does it impact on nurses’ time spent documenting clinical care?

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Who are we?

- Centre for Health Systems & Safety Research, The Australian Institute of Health Innovation. Faculty of Medicine, University of New South Wales.
- Core research areas for the Centre include:
  - Medication safety & e-health systems
  - Work innovation
  - Pathology & imaging informatics
  - Communication & work patterns
  - Aged care
Why is medication monitoring important?

- **Safety concerns** *(Chakravarty, et al. 2008).*

- **Drug monitoring is time-consuming** *(Goldman, et al. 2010).*

- **High potential for error** *(Callen, et al. 2011).*

- **Drug monitoring can be assisted with the use of Information & Communication Technology (ICT)** *(Goldman, et al. 2010).*
Study Aim

To evaluate the impact of an electronic Drug Monitoring System (eDMS) on the time nurses spent on clinical documentation associated with monitoring rheumatology patients, specifically those patients who were being treated with Disease Modifying Anti-Rheumatic Drugs (DMARDs).
Research Method

- **Design:** Before and after observational study.

- **Setting:** Rheumatology Outpatient Department; 855 bed metropolitan hospital in Sydney.

- **Population:** Three Registered Nurses & one Clinical Nurse Specialist.
Drug Monitoring Process Pre-eDMS

- Combination of manual and electronic systems.
- Process of monitoring was cumbersome.
- Completely reliant on verbal notification from the physician to the nurse.
The electronic Drug Monitoring System (eDMS)

- Module of the Hospital Clinical Information System (Cerner).

- Designed in-house to assist physicians and nurses in monitoring rheumatology outpatients.

- Auditable, legible trail of actions related to monitoring.
<table>
<thead>
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<th>Dose</th>
<th>Units</th>
<th>Route</th>
<th>Frequency</th>
<th>Medication Status</th>
<th>Reason for Change</th>
<th>Date Ceased</th>
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<thead>
<tr>
<th>Reason For Monitoring</th>
<th>Blood Monitoring Period</th>
<th>Duration</th>
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<tr>
<td>DMARD Monitoring</td>
<td>Every 6 weeks</td>
<td>6 months</td>
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</tbody>
</table>

Medication details

Reason for monitoring & monitoring period
Are results available?

Results of blood tests

Information on blood test results
Timing Data Collection Tool


- Using a PDA tool, specific work tasks are captured by the researcher. What task? Who with? Where the task is documented?

- Automatic time-stamp → task duration is calculated.
Data Collection & Analysis

- Pre-eDMS: Timing sessions (approx. 40 hours) carried out over a two-week period in 2009 (September-October).

- eDMS implemented November 2009.

- Post-eDMS: Timing sessions (approx. 40 hours) carried out over a two-week period in 2011 (February-March).
Results

- Significant reduction in the proportion of nurses’ time spent documenting information in relation to medication monitoring (13.6% pre-eDMS to 7.2% post-eDMS, \(P<.0001\)).

- Mean task time in each documentation task in relation to medication monitoring decreased from 70 seconds pre-eDMS to 57 seconds post-eDMS (\(P<.0001\)).
Percentage of time spent by nurses documenting clinical care prior to and following implementation of the eDMS

### Documentation Source

- **Percentage (%) of time spent by nurses documenting clinical care**

  - **Pre eDMS**
  - **Post eDMS**

<table>
<thead>
<tr>
<th>Documentation Source</th>
<th>Pre eDMS</th>
<th>Post eDMS</th>
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<tbody>
<tr>
<td>HCIS</td>
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<td>eDMS</td>
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### Key

- **Pre eDMS**
- **Post eDMS**
Discussion

- Introduction of eDMS → nurses documentation time almost halved.

- More nurse-led clinics → increase in direct patient care activities.

- Documentation practices regarding medication monitoring were streamlined.
Challenges

- Multiple information systems are still used by nurses to document clinical care.

- Challenges in documenting real-time clinical care in a busy setting.
To conclude...

- Information technology → positive impact on the time efficiency of nurses.
References


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