Does PACS facilitate work practice innovation in the intensive care unit?

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PACS and Imaging

- Picture Archiving and Communication Systems – PACS
- Point-of care delivery of electronic images
- Increasing use in healthcare worldwide
Potential of PACS

- Image availability
- Radiology reporting times
- Workflows
- Issues associated with lost images
- Reduces the time clinicians spend searching for images

The Intensive Care Unit (ICU)

- Most critically ill patients in the hospital
- Critical decisions made daily
- Imaging vital to patient care
  - Daily imaging examinations
  - Chest x-rays, CT scans
PACS and the ICU

- Potential for faster clinical decision-making
- Decisions made on ICU ward rounds
- Aim: to examine how accessing images is integrated into daily ward rounds in the ICU, and to assess whether the presence of PACS produced innovations in ward round work practices.
### Study Setting

3 metropolitan Australian ICUs

<table>
<thead>
<tr>
<th>ICU Site</th>
<th>ICU Beds</th>
<th>PACS Availability</th>
<th>Computerisation</th>
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</thead>
</table>
| 1        | 54       | • AGFA IMPAX  
• 9 years                       | Bedside computers 
Central workstations         |
| 2        | 28       | • GE Centricity Web 
• 8 months                     | Central workstations          |
| 3        | 13       | • GE Centricity Web 
• Pre-PACS - No 
• Post-PACS - 6 months        | Central workstations          |
Research Methods

**Participants**
- Staff specialists
- Registrars
- Residents

**Study Design**
- Direct observation - 94h
- One-on-one semi-structured interviews - 48
Imaging Access on Ward Rounds

Site 1
- Infrequent viewing

Site 2
- Frequent viewing

Site 3
- Infrequent viewing
Site 1 – image access

Positive comments associated with PACS

“you can just look up an x-ray at the bedside when you’re interested on the ward round…” Senior Registrar

“...the ability to see an x-ray within minutes of it being taken is just brilliant. And to be able to see an x-ray at every bedside without having to walk back and try and find it.” Staff Specialist

General access to images on PACS outside ward round at central workstation
Site 1 - Context

“compartmentalization” of the ward round

“...although a number of the bedside computers don’t have the resolution necessary to have a proper look at PACS.”
Senior registrar

Afternoon x-ray meeting
Site 2 – image access

- Images accessed on the majority of rounds
- Length of rounds
- Twice weekly radiology meeting
Limited image access during the round – pre- and post-PACS

“And I might want to come back and have another look. Just a quick look. And sometimes I’ll be there numerous times during the day. And access, quick access is readily available.” Staff Specialist

“Handover round” access

Twice weekly radiology meeting
Site 2

- Ward round structure
- “I think it increases the ability for us to actually get through the round and it makes sure we actually see what we need to see and it also means that the patients are safe because everyone’s on the same page.” Staff Specialist

Site 3 - Pre-PACS

- perceptions of potential change – 1 doctor

Site 3 – Post-PACS

- Little change observed
- Image access during round observed occasionally
Perceptions of Bedside Computers

- NO bedside computer
  - Perceptions of enhanced decision-making with PACS at the bedside
  - “Whereas if it was at the bedside: examine, look at the numbers, look at the x-ray and then you can formulate a plan.” Senior Registrar

- Presence of bedside computers
  - Images rarely viewed during ward round
To conclude......

- Presence of PACS did not lead to significant changes in practice
- Anticipated practice can be different to actual practice
- Presence of bedside technology does not automatically lead to innovative practices
- Context of the ICU can play a role in the use of technologies
Thank you

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- Australian Research Council Linkage Grant in partnership with a local Area Health Service (LP0989144)

MIE
Researcher:
So do you think that having PACS has changed your work practices?

Participant:
Yeah, yes it has. I went from frustrated and neurotic intensivist to one who’s now just only mildly frustrated and neurotic...