



@Jonessop

Case based learning in a simulated electronic medical record: Digital health education for nursing students

Sophie Jones

Digital Health Education & Workforce Development lead (Nursing)

The University of Melbourne



MEDINFO23

8 - 12 JULY 2023 | SYDNEY, AUSTRALIA



Statement by Kat Clarke - "This artwork depicts the united values MDHS are guided by. The shields we are protected by these values but also loyal to them. Surrounding the shields are the communities that are connected to MDHS, such as the Hospitals and research centres. The line work pattern in the shields represent how each value is linked as each one doesn't work without the other."



Artist: Kat Clarke · Wurundjeri translation: Gail Smith, Wurundjeri Elder from Wurundjeri Council



Embedding Digital Health

Consistent with National Nursing and Midwifery Digital Health Capability Framework (2020), the Department of Nursing has embedded digital health in the Master of Nursing Science entry-to-practice curriculum.

Involved:

- Learning outcomes relevant to digital health skill development
- Development of interprofessional Electronic Medical Record (EMR) learning modules
- Purchase of workstations (computers) on wheels
- Identification and use of an appropriate simulated EMR software program.
- Elective subjects

(Australian Digital Health Agency, 2020)





Master of Nursing Science at UoM

- Two year graduate entry to practice degree
- ~200 students per year
- Clinical subjects are year long with associated professional experience placement



CSIRO Case Based Learning EMR


- A teaching tool developed in a collaboration between the Australian eHealth Research Centre of CSIRO and The University of Queensland.
- Supports case-based learning via custom built “patient cases” in an electronic medical record.
- The approach is intended to:
 - 1) support the development of digital literacy via engagement with an EMR
 - 2) enhance the pedagogy of case-based learning by providing opportunities for clinical decision-making.

(Braunstein et al., 2019)



Case Based Learning EMR

THORN,Alex User: Jones, Sophie

 Name: **THORN, Alex**
Adverse Reactions: Penicillin, Codeine Date of Birth: 1930-04-14 Age: 92 years Sex: male Gender Identity: male
Indigenous Status: Neither Aboriginal nor Torres Strait Islander Dose Weight: 87kg Current Location: Ward 1B Resuscitation Status: Resuscitate MRN: 45978

History
Conditions
Physical Exam
Investigations
Medication
Scan QR Code
Case

Patient Details
Personal details of the Patient

Patient ID: 45978

Patient Title: Mr Patient Given Names: Alex Patient Surname: Thorn

Date of Birth: 1930-04-14 Age: 92 years Indigenous Status: Neither Aboriginal nor Torres Strait Islander

Sex: male Gender Identity: male

Address:
Residential Care Facility

Contact Number:
03 9999 3333

Administrative Patient Note
5 days ago Mr Thorn was brought in by ambulance (BIBA) after care facility staff found him unresponsive on his bedroom floor. It was unknown how long he had been lying there. Gained consciousness shortly after, with prominent right arm and right leg weakness. He also was not interactive and looked very vague.

Patient History
Clinical History of the Patient

Encounters



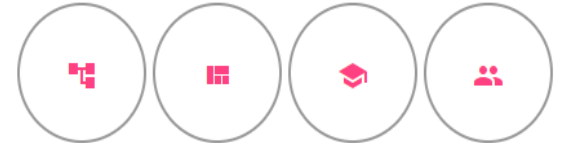
Case Based Learning EMR

- Cases (patients) can be authored in the system to reflect the learning needs of students
- Data is coded according to SNOMED CT terminology
- On FHIR – Fast Healthcare Interoperative Resources
- Cases can include clinical decision making, discussion points, activities, MCQs
- Interprofessional capability



Implementation

- 23 unique cases developed in 2022 & 2023
- Students worked in groups in the simulation labs to:
 - Assess and collect clinical information
 - Respond to changes in patients' clinical status
 - Make clinical judgements
 - Document or communicate findings
 - Explain and discuss their decision-making
- Assessments were developed focussed on clinical communication skills using an EMR





Evaluation

Objectives

- Assess the usability, utility, acceptability of the CBL EMR software for entry-to practice nursing students.
- Assess student experience of using the CBL EMR platform.



Evaluation Plan

- A survey was developed using the Systems Usability Scale (Bangor, Kortum, & Miller, 2008; Sousa & Dunn Lopez, 2017)
- 13 Likert scale questions
- Six open-ended questions
- UoM ethics approval obtained (102022-23738-32229-3)
- Descriptive analysis of categorical data
- Content analysis of the text responses



Preliminary Results

Question	N (%) agree/ strongly agree
	N= 22
I think that I would like to use this system frequently.	12 (54.5)
I found the system unnecessarily complex.	2 (9)
I thought the system was easy to use.	12 (54.5)
I found the various functions in this system were well integrated.	10 (45.6)
I would imagine that most people would learn to use this system very quickly.	16 (72.7)
I found the system very cumbersome to use.	5 (22.7)
I felt very confident using the system.	11 (50)
I think that this teaching tool has potential to enhance my understanding of digital health.	16 (72.7)
I think that this teaching tool has potential to enhance my clinical decision-making skills.	12 (54.5)
This teaching tool was useful in preparing me to use an EMR on professional experience placement.	10/ 20 (50)



Preliminary Student feedback

Placement experience



“I was already confident using an EMR, so the learning curve to use another EMR was less”

Learning on placement



“I think the CBL EMR set a baseline expectation of what is going to be used in PEP”

Suggested Improvements



“It would be great to have a chat feature to mock message others in the multidisciplinary team.”



Cased Based Learning EMR - Limitations

- Minor issues regarding student access
- Preliminary results only
- No electronic medication administration chart
- Limited functionality for assessment
 - No track and trigger of observations



Conclusions

- Digital health information is central to the delivery of high-quality healthcare and the improvement of patient outcomes
- Preliminary data indicates that students see the value in engaging with a simulated EMR
- The CBL EMR was easy to use and enhanced understanding of digital health technologies
- Exposure to a simulated EMR enhances student preparedness for clinical placement



Thank you





References

Agency, A.D.H., *National Digital Health Strategy. Safe, seamless and secure: evolving health and care to meet the needs of modern Australia*. 2018, Australian Government. p. 63.

Agency, A.D.H., *Australia's National Digital Health Strategy: Framework for Action*. 2018, Australian Government. p. 88.

Agency, A.D.H., *National Nursing and Midwifery Digital Health Capability Framework*. 2020, Australian Government. p. 37.

Australian Government, D.o.E., Skills and Employment., *Australian Qualifications Framework*, S.a.E. Department of Education, Editor. 2013: Australia.

Braunstein, M.L., et al., *The development and electronic delivery of case-based learning using a fast healthcare interoperability resource system*. JAMIA Open, 2019. **2**(4): p. 440-446.

Bangor, A., P.T. Kortum, and J.T. Miller, *An Empirical Evaluation of the System Usability Scale*. International Journal of Human–Computer Interaction, 2008. **24**(6): p. 574-594.

Sousa, V.E.C. and K. Dunn Lopez, *Towards Usable E-Health. A Systematic Review of Usability Questionnaires*. Appl Clin Inform, 2017. **8**(2): p. 470-490.

Brooke, J., *Sus: a "quick and dirty" usability*. 1996. **189**(3).

Samadbeik, M., et al., *Education and Training on Electronic Medical Records (EMRs) for health care professionals and students: A Scoping Review*. International Journal of Medical Informatics, 2020. **142**: p. 104238.

•