Guideline-based Decision Support in Australian Critical Care Nursing: a multi-level approach

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Introduction


- Are means through which the knowledge embedded in clinical guidelines (CG) can be delivered effectively at the point-of-care
- Sharability and integration into professional work practice can be significantly limited due to required clinical workflow modelling and information exchange in complex environments such as Critical Care
Introduction: A Solution

- An adaptive multi-level GDSS based on a novel pattern/guideline approach
- Requires a meta-model that supports at least a two level clinical workflow modelling (Ahamed, Gogler, Hullin & Morrison 2006)
  - Pattern specification
  - Clinical activity or treatment plan specification
Introduction: A Solution

- Pattern specification
  - Reason-based workflow switching to meet patient-specific and context-specific needs
- Clinical activity or treatment plan specification
  - Event-driven workflow adapting by incorporating actionable recommendations from a CG
Objectives

- To derive a meta-model that supports the Australian nursing practice and addresses the key requirements in a multi-level GDSS approach
  - Process model
  - Information model
- To validate the model
Methods

- An Action Research design (Baskerville 1999)
- The client-system infrastructure - Austin Centre for Applied Clinical Informatics (ACACI)
Methods

- Literature review to identify key characteristics of a GDSS for the Australian Nursing Practice
  - Contrast existing nursing decision-making models against the Australian nursing practice to identify the scope of decision-making
  - Review existing GDSS approaches in the Australian healthcare domain for their applicability in an acute care setting (Barretto 2005; Liaw, Morrison, Lewis & Deveny 2004)
Methods

- Interviews
  - To derive an initial set of representative clinical use-cases to help synthesise the identified requirements

- Retrospective review of paper medical records on Diabetic Ketoacidosis (DKA) case types during the period of 2003-2005
  - Use-cases were updated from the review

- The multi-level model is being iteratively developed
Results

- Temporal patterns of collaborative clinical practices or processes
- Classes of nursing decision-making tasks in these processes
- Required information in these classes of decision-making tasks and by a GDSS (ongoing)
- A focus group consisting of critical care nurses from different Intensive Care Units (ICUs) throughout greater greater Melbourne (being formed)
Discussion

- Information model of the intended meta-model
  - Information needed in and for processes
  - Information needed by a GDSS
  - A virtual Medical Record (vMR) is a construct of the model (Johnson, Tu, Musen & Purves 2001)
  - The required set of Electronic Health Record (EHR) entities in the vMR must support both functional and semantic interoperability (NEHTA 2005)
Conclusions

- Anecdotal evidence about temporal patterns of collaborative clinical practices and classes of nursing decision-making tasks are confirmed.

- The meta-model being developed is addressing:
  - Implementation gaps between the Australian interoperable e-health standards development and functional requirements specifications.
  - The lack of standard interface models between the EHR and required knowledge representations.
References/Correspondence

- Johnson, PD, Tu, SW, Musen, MA & Purves, I 2001, 'A Virtual Medical Record for Guideline-Based Decision Support', paper presented to Proc. AMIA Annual Symposium, Washington, District of Columbia, USA.

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