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

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Introduction

- Guideline-based Clinical Decision Support Systems (GDSS):
 - 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 patientspecific 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)



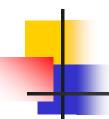
Methods

- 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 Melbourne (being formed)



Discussion

- Information model of the intended metamodel
 - 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



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