Modelling Clinical Guidelines and Protocols for the Prevention of Risks Against Patient Safety

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Modelling Clinical Guidelines and Protocols
for the Prevention of Risks Against Patient Safety

• Clinical Guidelines
  – Systematically created recommendation describing optimal care (based on scientific evidence)

• Clinical Protocols
  – Concise, localised versions of guidelines

• Why modelling?
  – To transform natural language text and diagrams to computer-processible data
    • Automatic linking to Electronic Health Record
    • Verification, Validation, Simulation, Critiquing, ...
Modelling Clinical Guidelines and Protocols
for the **Prevention of Risks Against Patient Safety**

- Patient Safety ~ Optimal care
- Risk against patient safety ~ Deviation from the protocol
- Prevention of RAPS through
  - Quality assurance of the care process
  - Detecting potential problems through simulation
  - Detecting deviation from optimal care
  - Presenting recommendations at the point of care
Asbru

- Representing treatment steps as plans
  - hierarchical decomposition
- Complete formal semantics
- Automatically executable
- Very complex
MHB
The Many-Headed Bridge

- Semi-formal
  - Bridging natural language and Asbru
- Sentences ~ Chunks
- Aspects of chunks grouped in 8 dimensions
  - control
  - data
  - time
  - background information
  - evidence
  - patient aspects
  - resources
  - document structure

- Compatible with alternatives to Asbru
Labour and delivery managed.

1. **ADMISSION CRITERIA**

   Admission to the hospital must be done in case of:
   a. rupture of membranes
   b. active labour
   c. abnormal fetal heart rate tracing
   d. maternal of fetal clinical reason

   At admission:
   a. collect case history
   b. measure blood pressure
   c. perform vaginal examination
   d. perform fetal heart rate evaluation and an ultrasound agreement of gestational age

   Emergency and personal hygiene should not be part of routine clinical practice.
Labour and delivery management

1. **ADMISSION CRITERIA**

   Admission to the hospital must be done in case of:
   - rupture of membranes
   - active labour
   - abnormal Fetal Heart Rate Tracing
   - maternal of fetal clinical reason

   At admission:
   - collect case history
   - measure blood pressure
   - perform vaginal examination
   - perform fetal heart rate evaluation and an ultrasound assessment of amniotic index

Enemas and perinal shavings should not be part of routine clinical practice.
OMA
Original text – MHB – Asbru

• Original protocol mixed with table representation of MHB and optionally Asbru

• Index listings

• Cross reference listings showing missing bits
[ Provision of information and communication ]

The possibilities of breast reconstruction should be discussed with the patient prior to non-breast-conserving surgery. The patient should also be informed that a correction may be carried out on the other breast. In women who, preoperatively, have a higher risk of requiring postoperative radiotherapy, the increased risk of complications should be considered when deciding whether to carry out primary or secondary reconstruction.
The Modelling Process

- Clinical Protocol
  - modelling using DELTA
- Initial MHB Model
  - modelling using DELTA
- Consolidated MHB Model
  - automatic debugging for missing MHB parts
- Complementary Knowledge
- Initial Asbru Model
  - automatic debugging for missing Asbru parts
- Consolidated Asbru Model
  - modelling using DELTA
  - modelling using DELTA
Risk Prevention by CGP Modelling

• Detailed examination of original document during modelling
  – Informal
  – Formal
• Optional execution at the point of care
  – Assisting in the selection of care steps
• Optional simulation
  – To find out problems
    • in the care process
    • in the CGP
Conclusion

• Prevention of Risks Against Patient Safety is important

• CPGs play an important part in RAPS prevention
  – but need to be modelled
  – which is hard

• Our contribution:
  The modelling process & tools