Clinical Workflow Modeling in Obstetrics: Hepatitis B in Pregnancy

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Abstract

Evidence-based clinical guidelines positively effect physician decision-making. Actionable clinical guidelines that actively trigger alerts, reminders, and instructive texts will increase effectiveness. We applied Activiti, a Business Process Model and Notation language system to model a clinical guideline for the prevention of mother-to-child transmission of hepatitis B as a computerized clinical workflow. Furthermore, we implemented an interconnected Arden-Syntax-based medical rule engine, which is part of the ARDENSUITE software.

Keywords:

Practice Guidelines; Decision Support Systems, Clinical; Pregnancy Complications.

Introduction

This study addresses the (partial) implementation of the "Hepatitis B in pregnancy" guideline: a clinical workflow providing evidence-based instructions on preventing mother-to-child transmission of hepatitis B during delivery. The guideline is in use at the Department of Obstetrics and Gynecology at Vienna General Hospital, Austria (Figure 1).

Methods

Business Process Model and Notation: the open-source workflow platform Activiti for the development of Business Process Model and Notation (BPMN) workflows [1, 2].

Arden Syntax: data access and knowledge-based clinical guidelines were implemented in HL7's standard notation Arden Syntax part of the ARDENSUITE solution [3-5].

Results

BPMN translation permitted automation or the provision of reminders to the pediatrician of the following tasks:

- Active and passive immunization after childbirth
- Specific breastfeeding recommendation depending on the results of HBeAg and hepatitis B PCR testing
- Availability of order forms for in-house or external lab testing for HBsAg or HBeAg and/or hepatitis B

Conclusion

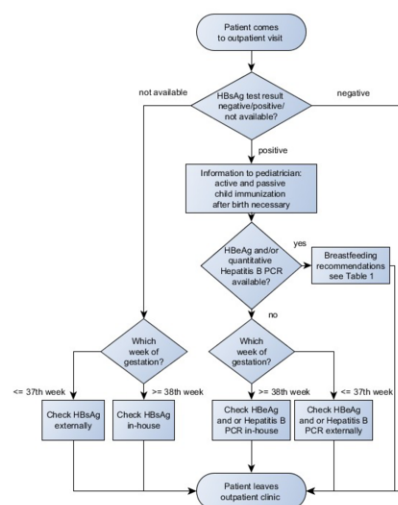We presented a clinical workflow implementation connecting

Figure 1 - Hepatitis B clinical guideline

a BPMN-based workflow using the ARDENSUITE. This simplifies complex clinical guidelines by dividing them into workflow, knowledge processing, and data access steps and separates patient data access and knowledge-based decisions from the actual workflow/workflow decisions. This is essential for integrating evidence-based clinical guidelines into the patient care process.

References

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