Computer-interpretable Guidelines driven Clinical Decision Support Systems

An Approach to the Treatment Personalisation Routes of Patients with Multi-Diseases

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Overview

- Introduction
- Why do we need a Clinical Decision Support System (CDSS)?
- Why do we need computerised guidelines?
- **Treatment Personalisation Routes of Patients**
  - Stage 1: Patient-medical centre encounter
  - Stage 2: CIG-CDSS encounter
    - *Concepts & Complexities of multi-disease treatments*
  - Stage 3: Patient-caregiver encounter
- Results
- Conclusion
Introduction

Objective....

...is to propose a **Computer-interpretable Guideline (CIG)**-based framework on the treatment personalisation routes of patients with multiple diseases under a Clinical Decision Support context.

- How treatments of multimorbid patients can be personalised…
  …what are the main stages that constitute a treatment personalisation route?

- What kind of constraints may occur when multiple CIGs are concurrently implemented to patients that have multiple clinical conditions?

- How does patient-centred care have an influence upon the healthcare chain that integrated with CDSS?
Why do we need a computerised Clinical Decision Support System?

- Clinical Decision Support Systems (CDSSs) help to **customize care plans** for each patient.

- Studies have shown that the adoption of computer-based CDSS:\(^1,^2\):
  - reduce clinical errors,
  - improve the caregiver performance and patient outcomes,
  - provide guidance to caregivers on preventing future diseases...

& many others…
Why do we need computerised guidelines?

- In the case of multimorbid patients, conciliation of the activities recommended by various single-disease CPGs...

...**formal & customisable** to different clinical situations therefore be translated into...

**Personalised Treatment Plans...**
Patient-Medical Centre Encounter

CIG-CDSS Encounter

Patient-Caregiver Encounter (Patient-Centred Care)
Results

- This study has resulted in;
  ...the identification of the typical use of CIGs in healthcare.

- Many techniques have been proposed to provide the effective medications, eliminate conflicts stemming from the concurrent implementations of multiple CIGs...
  
  ...Constraint and logic based programming\textsuperscript{4,5}, graph-theory based application, answer set programming\textsuperscript{6}...

- With \textbf{CIG-driven CDSS}, patient $\leftrightarrow$ caregiver

  ...enhance the patients’ attention in the contents of their health records, better the patients’ health level\textsuperscript{7,8}. 
Conclusion

- We summarise the findings of an extensive review of the literature on the key components of CDSSs and proposes a framework of integrating CIGs into the delivery of care.

The proposed framework…

HOW

...clinical recommendation mechanisms work in practice…

...the adoption of CIG-based CDSS and patient-centred care can improve the caregiver performances, patient outcomes…

...treatments of patients with multiple-diseases can be personalised…
References


Thank you

Any Questions

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