An Ontology based Scheme for Formal Care Plan Meta-Description

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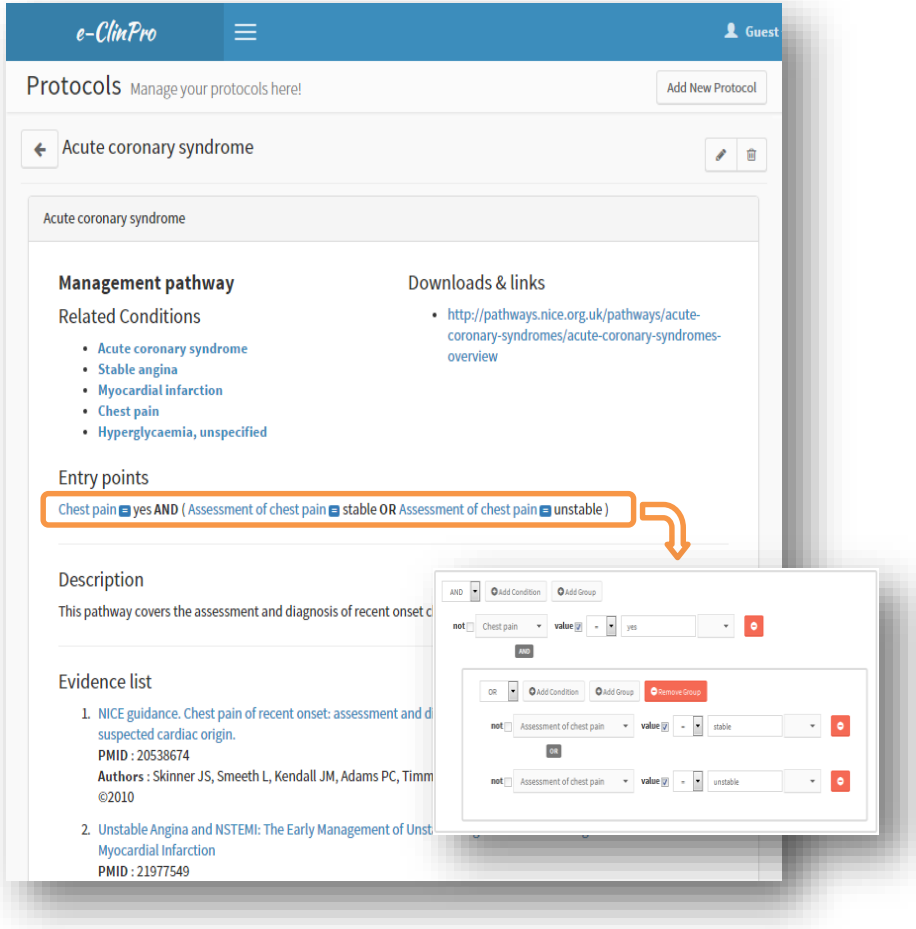
Overview

- Propose a conceptual model and an ontology for a meta-description of formal care plans
  - *Focusing on care plans as a whole and not addressing internal algorithmic steps*
- The proposed care plans model allows
  - *Semantic tagging*
  - *Semantic enrichment*
- Advantages
  - *Use and re-use care plans across platforms [searching]*
  - *Link to other scientific information (e.g. papers in PubMed, PHR, etc) [management]*
  - *Modeling of the provenance [organization]*
  - *Justifications for modifications [organization]*
  - Alterations to care plans *[organization]*

e-ClinPro: Clinical protocol management system

- A heterogeneous semantic social network to describe and organize clinical protocols
- The protocols' organization is based on their provenance, evolution and modifications

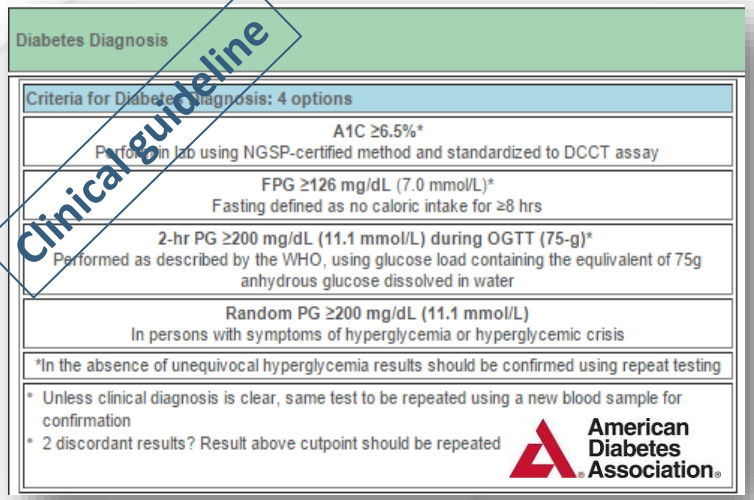


Formal care plans

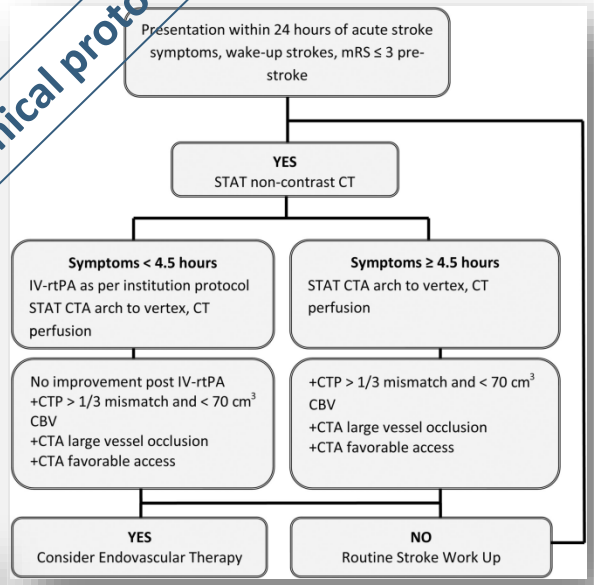
- Clinical guidelines
  - Systematically developed recommendations to address various clinical problems
- Clinical protocols
  - Detailed algorithms on how to address a particular clinical problem (based on guidelines)
- Care pathways
  - Care algorithms integrating multidisciplinary tasks for patient care in and outside the hospital (based on guidelines)
- …

Examples of formal care plans

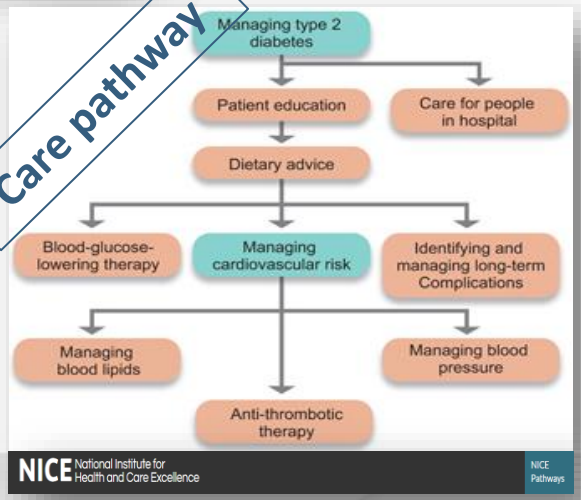
Clinical guideline



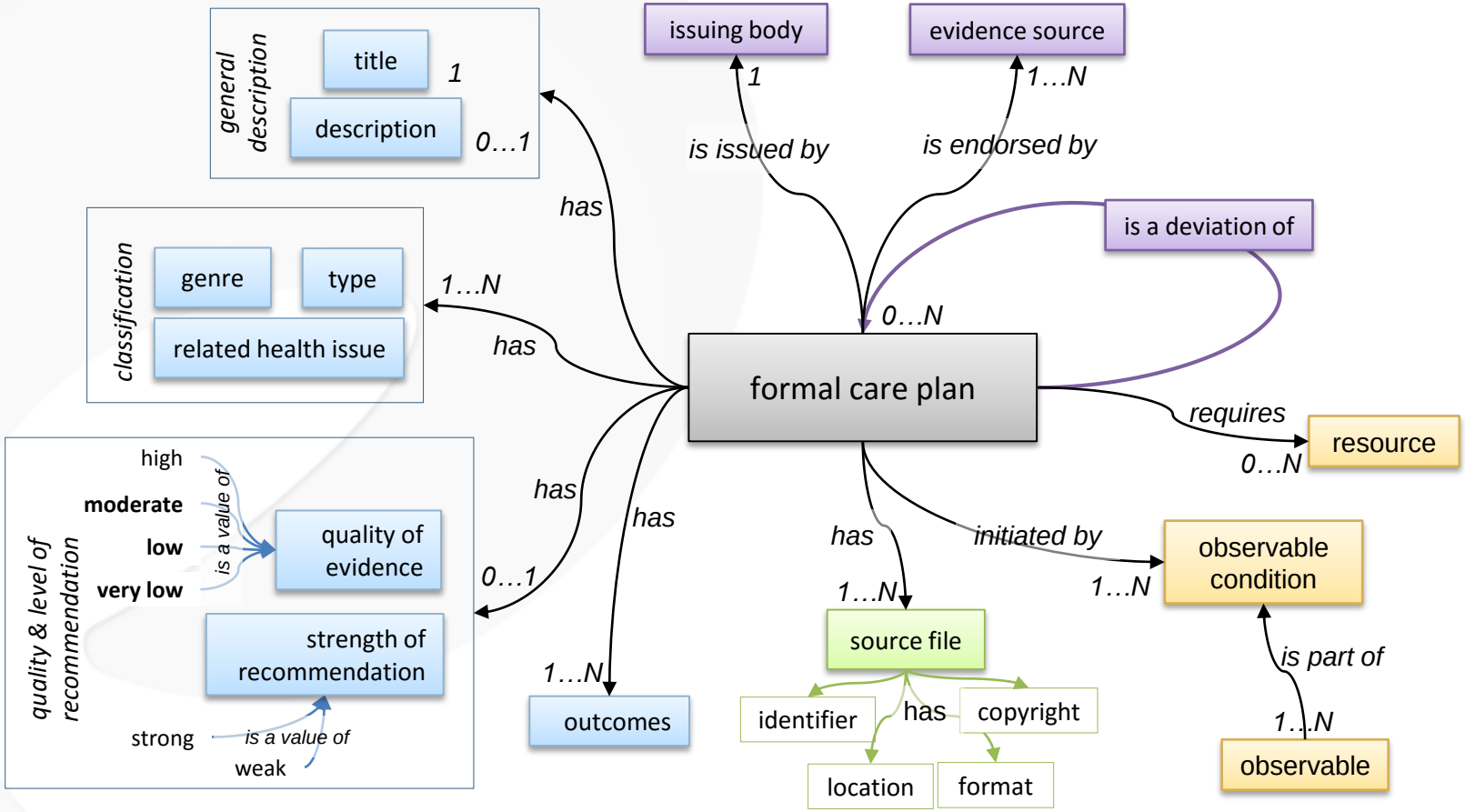
Clinical protocol



Care pathway

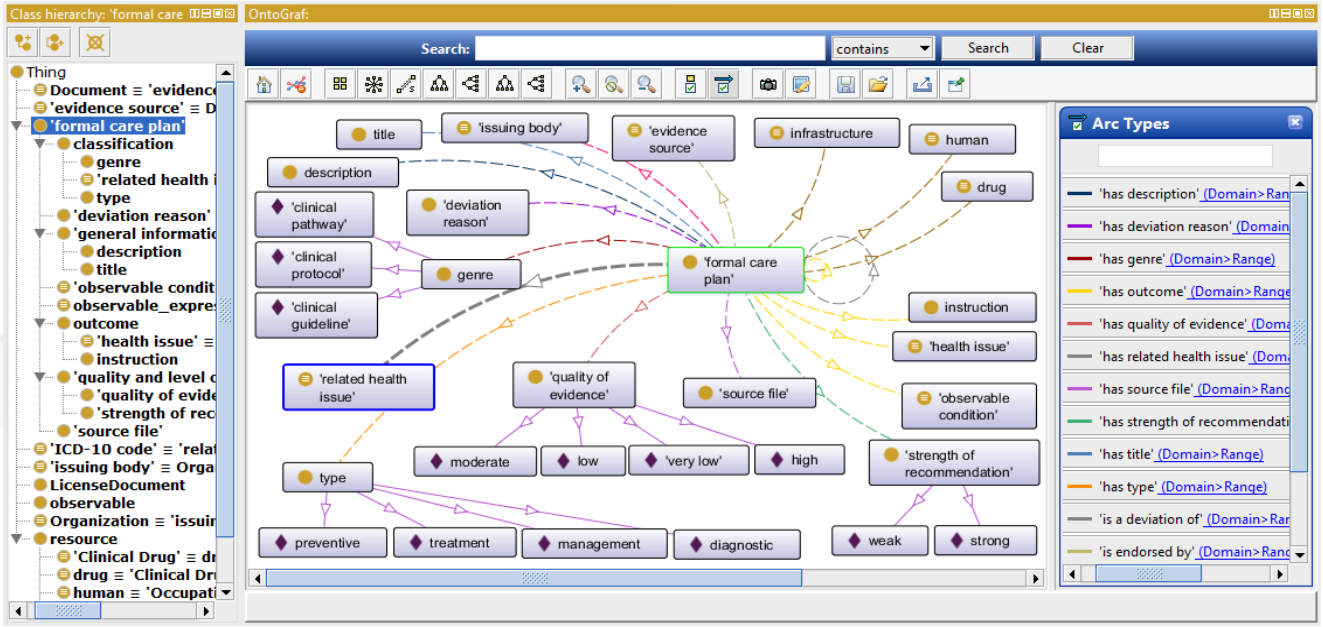


Conceptual model of care plan meta-description



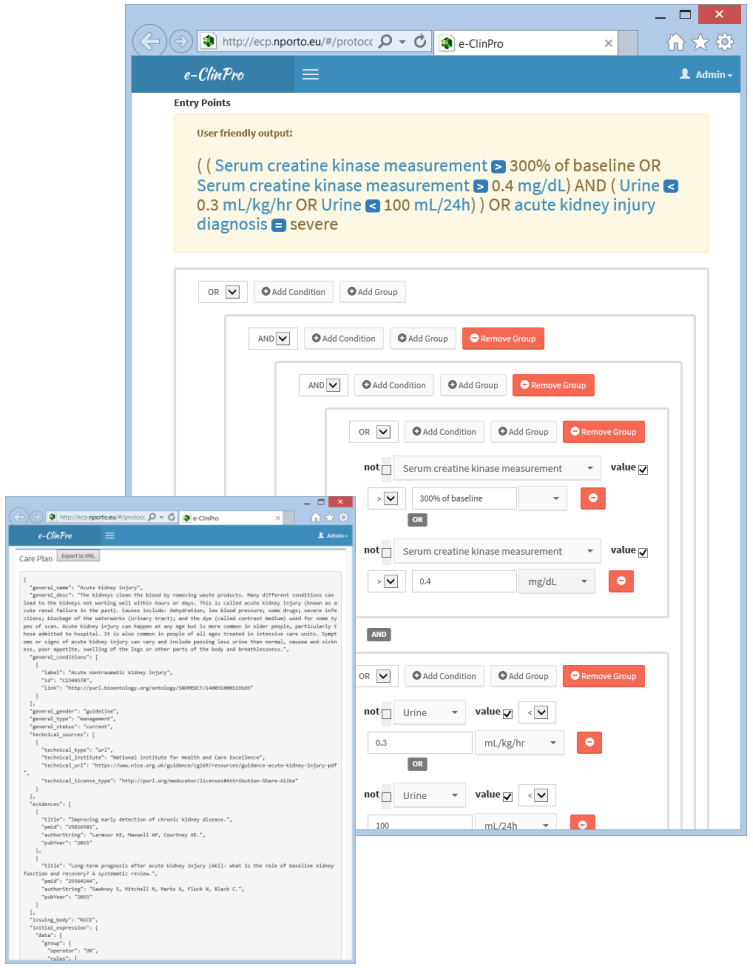
Ontology implementation

- Implemented with OWL2 using Protégé
- Available online in: http://purl.bioontology.org/ontology/ECP
- Integrated with commonly used standards and controlled vocabularies:
  - ICD-10, SNOMED-CT, QUDT, UO, GRADE and UMLS



Development process and evaluation

- Development by health care professionals (4 medical & 4 technology experts)
- Testing with 20 clinical protocols and guidelines (by NICE, NKF KDOQI, ADA, Hellenic Society of Nephrology and 2 Greek National University Hospitals)
- Medical experts found:
  - The model was straightforward to use
  - The terminology was familiar and easy to understand and apply
  - The only difficulty identified in the expression of initial logical condition



Conclusion

- Introduced a metadata scheme and ontology for the description of formal care plans

- Goal of the proposed scheme is to support:
  a) care plan management in electronic repositories
  b) organization and classification
  c) universal tracking queries of care plans used by search engines or medical portals
  d) literature of evidence provenance
  e) institutional provenance

- Our aim was to define in a formal, ontology-based, platform-independent metadata set to describe formal care plans and their relationships

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This work was supported by eCP: Electronic Clinical Protocols project (**MIS 375876**), funded under the Greek National Programme Thales and the FP7-ICT project CARRE (No. **611140**), both co-funded by the **European Commission**.

eCP: Development of electronic clinical protocols

CARRE Project: Personalized patient empowerment and shared decision support for cardiorenal disease and comorbidities

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