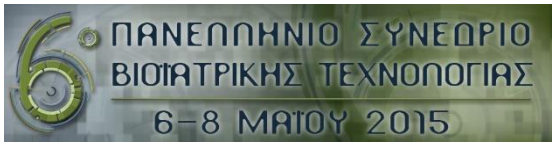


Semantic Conceptual Model for Managing Clinical Protocols

Nick Portokallidis, George Drosatos, Eleni Kaldoudi

School of Medicine, Democritus University of Thrace

6th Panhellenic Conference on Biomedical Technology
Athens, Greece, 6-8 May 2015

This work is supported by «Ανάπτυξη ηλεκτρονικών κλινικών πρωτοκόλλων», a Thales Project, MIS 375876, funded in part by the European Commission.

Clinical protocol vs Clinical guideline

- **Clinical protocols** are rigid statements allowing little or no flexibility or variation. A protocol sets out a precise sequence of activities to be adhered to in the management of a specific clinical condition.
  - Ground truth
  - Safety measures
  - Static
  - Apply only in clinicians
- **Clinical practice guidelines** or CPG's are systematically developed statements designed to help practitioners and patients decide on appropriate healthcare for specific
  - Recommendations
  - Educational Material
  - Always evolving
  - Flexible

Our goal: semantic protocol description

- **Protocol creation and adaptation speed up**
  - Clinicians can provide immediate feedback on protocol applications and variations
  - Health organizations leverages protocol recommendations to establish new protocols

- **Decision support systems (DSS) can take advantage of Electronic protocol database and metadata**
  - Quick and effective response in health crisis when no specialized clinicians are available at that time
  - Easier CP merging to address patient comorbidities thanks to protocol metadata description

Clinical Protocol ontologies

- **DILEMMA Generic Protocol Model (DGPM)**
  - Introduces protocol model and inheritance
  - Cannot fit to modern health care patterns
- **Core Clinical Protocol Ontology (C2PO)**
  - Introduces protocol recommendations
  - Developed in OWL using modern tools
- **SEMPATH and Clinical Pathway Ontology (CPO)**
  - Internal modelling of CP on rules and validation software

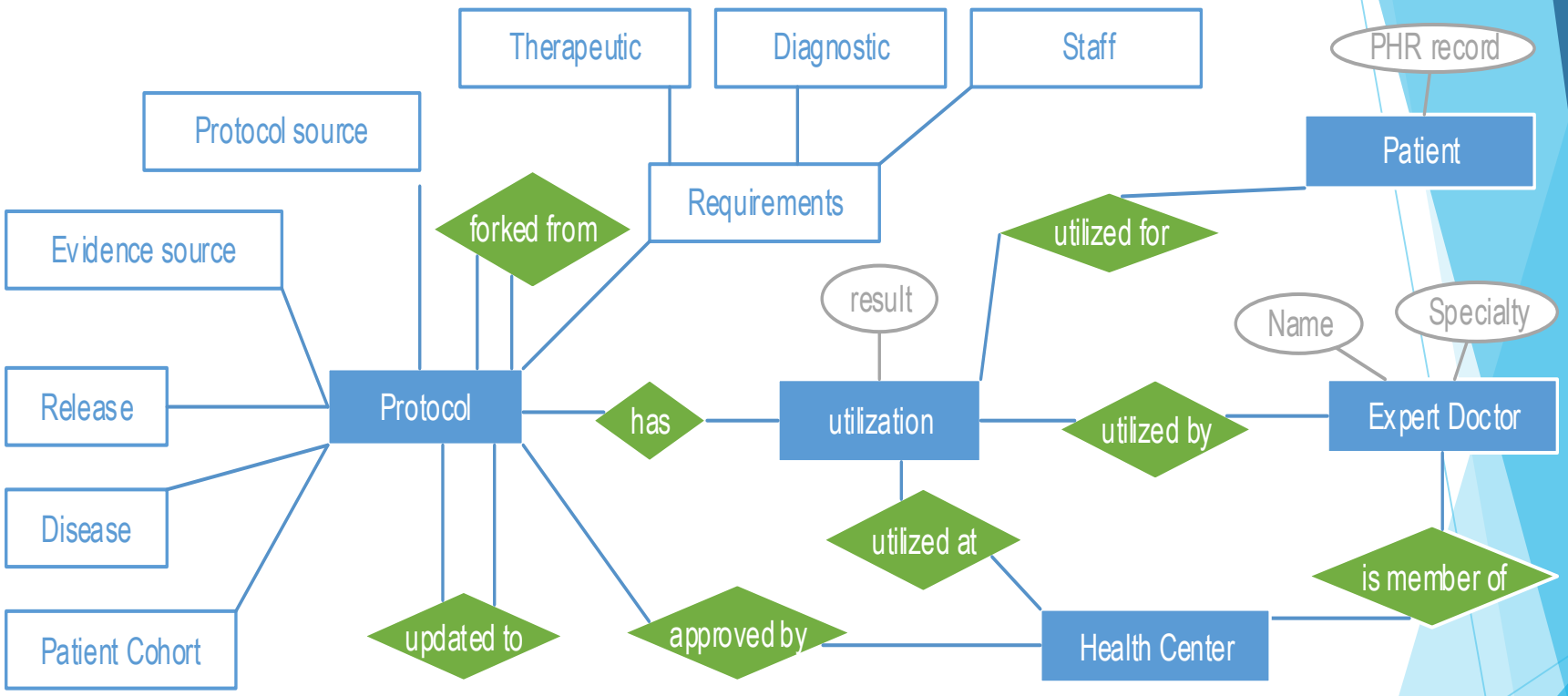
Our contribution

- Create a 2-layer social network of clinical protocols and clinicians
  - Native protocol recommendations
  - Comments and protocol promotions
  - Easier conversion from guidelines to protocols
- Introduce protocol evolution
  - Through forking process
  - Use adaptive protocols in smaller regions

Results and implementation

- Ontology engineering
  - Developed in OWL, using Protégé
  - Model properties with mappings to medical standards
  - Linked Data ready using Bioportal
- Commercial software integration
  - Visionware LIMS
- Entity – Relations Diagram
  - Organized by 5 main entities
  - Using 8 core entity relations

Semantic conceptual model



Thank you!

Any Questions?

Acknowledgement

This work is partly funded by eCP: Electronic Clinical Protocols, MIS 375876, a **National and Kapodistrian University of Athens** project funded under the Greek National Programme **Thales**, co-funded by the **European Commission**

Coordinator: **I. Skalkidis**