Development of hypertension management ontology for a guideline-based clinical decision support system

JiHyun Kim [a], InSook Cho [b], EunJung Lee [a], JaeHo Lee [c], Yoon Kim [d]

[a] *R & D Center for Interoperable EHR, Korea*
[b] *Dept. of Nursing, School of Medicine, Inha Univ., Korea*
[c] *Dept. of Emergency Medicine, College of Medicine, Univ. of Ulsan, Korea*
[d] *Dept. of Health Policy and Management, College of Medicine, Seoul National Univ., Korea*

Introduction_1

- In Korea, the Government leads an Electronic Medical Record (EMR) system development for the 152 public health centers, and this is planned to be expanded to a national Electronic Health Record (EHR) system.

- As a part of this project, a study on the development of clinical decision support system (CDSS) is currently being undertaken.

Introduction_2

- This study is one step in the construction of a guideline-based CDSS that will be used for hypertension management in public care settings

- A development of domain ontology is an essential part in representing knowledge in a computerized method, but it is also important for the reuse of knowledge in the interesting domain area.

- For the sharing of medical knowledge nationwide, a knowledge management method such as ontology is the main issue from the point of view of CDSS.

Materials and Methods_1

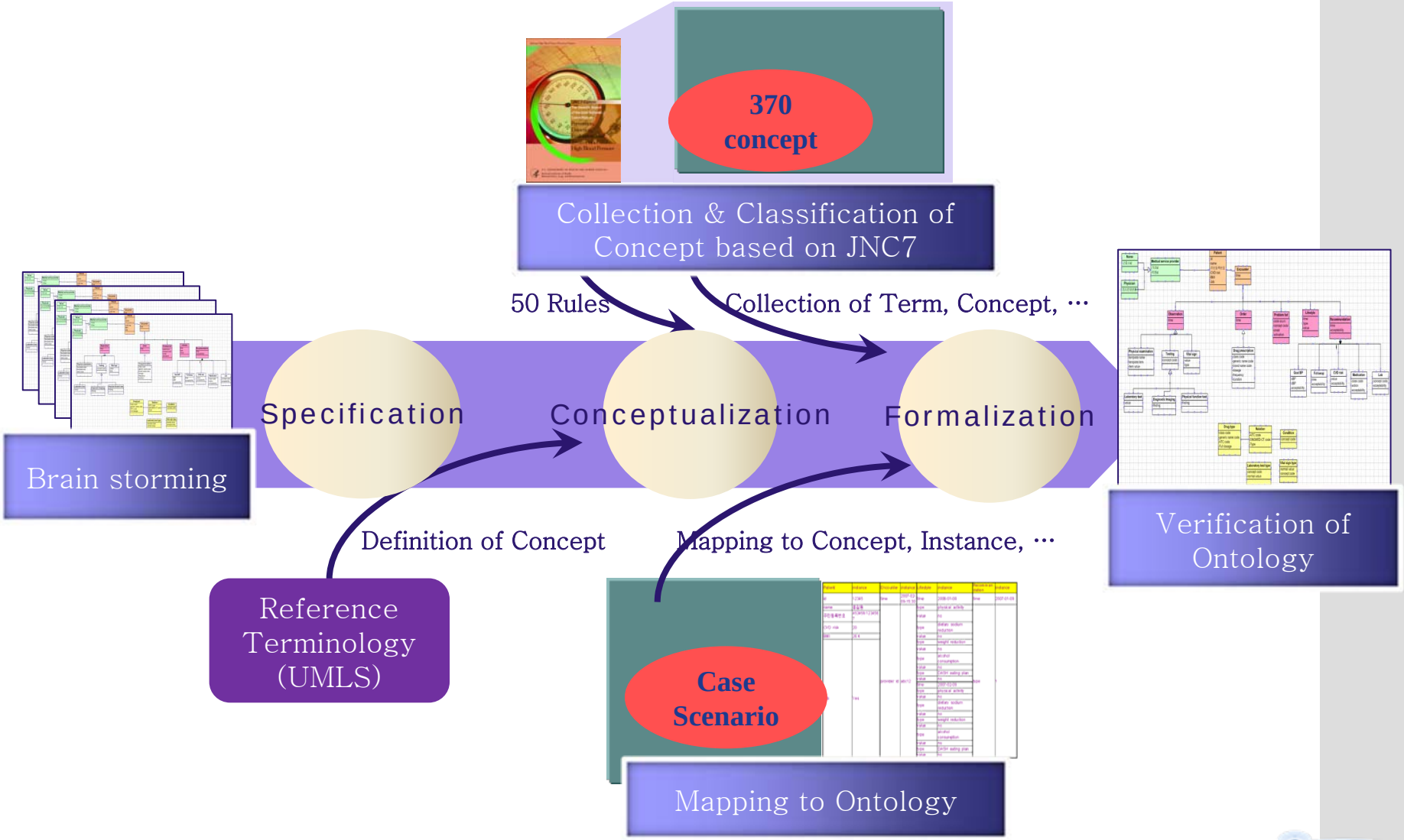
- This ontology is primarily based on the concepts extracted from 12 published hypertension guidelines, including JNC 7.

- The hypertension management ontology provides formal definitions, relationships and usage of various concepts relevant to patients with hypertension.

Materials and Methods_2

- Concepts were defined at the modeling stage, and defined concepts were classified according to semantic category.
- Relations and attributes of concepts were defined, and the Protégé 3.1.1 environment was used.
- Because the development of ontology is an iterative process, the modification and reconstruction will be continuous during the process of guideline encoding.

Research Process



Results_1

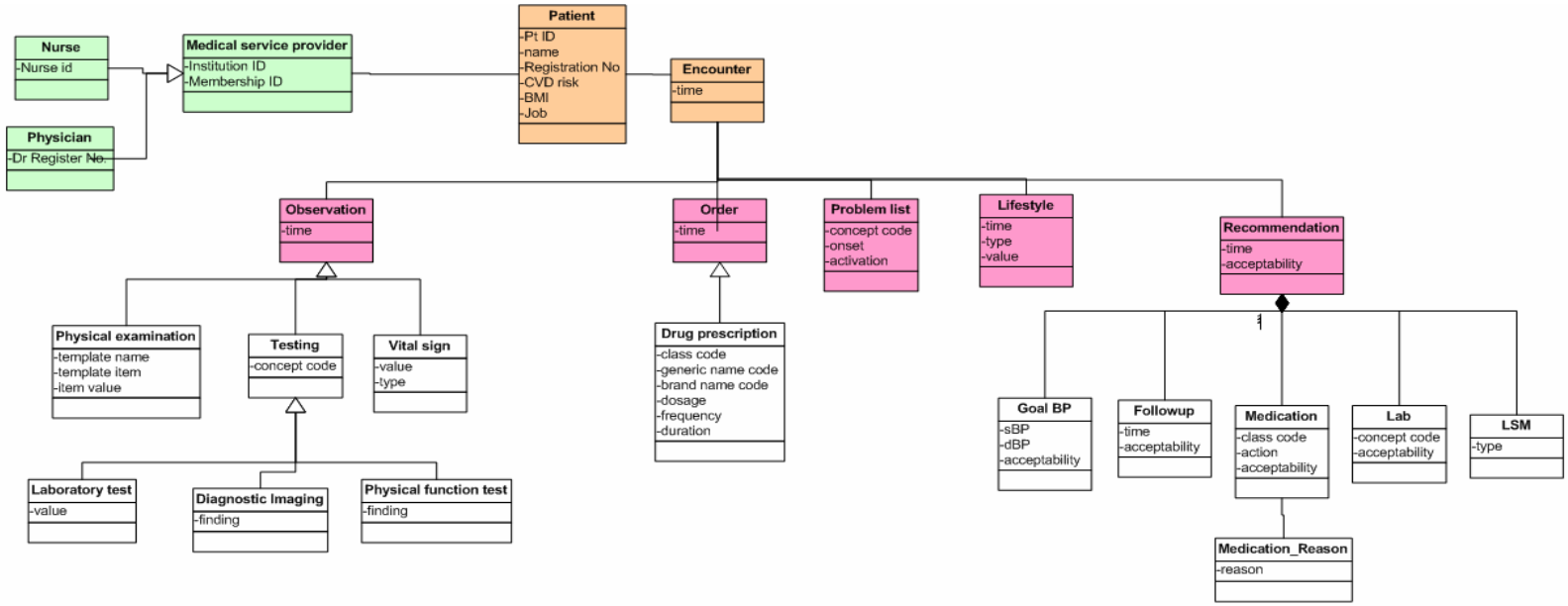
- In our ontology prototype, about 300 concepts relevant to hypertension management were defined.

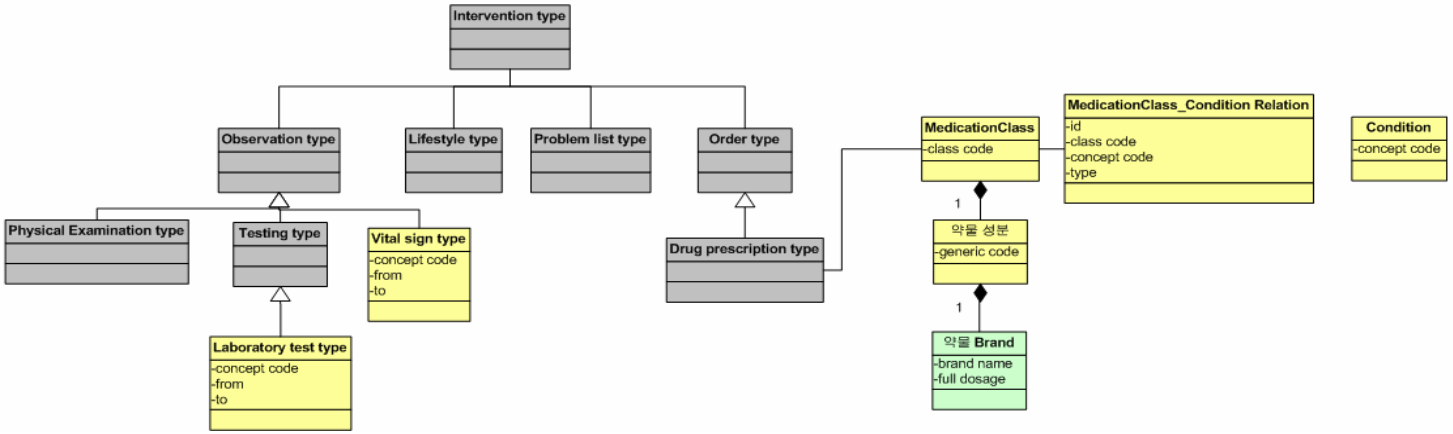
- A medication prescription, laboratory test, physical examination and other related conditions were included in the related concepts.

Results_2

- Based on all of this, high-level classes were defined as the main axis.
- Each class included subordinate concepts of is-a relation. After that, attributes of concepts were defined.

Domain ontology for Hypertension management





Conclusion

- Through this approach, the creation of a tool for the purpose of acquiring particular domain knowledge is expected to be easier.

- Furthermore, it is believed that the ontology of hypertension management for a guideline-based clinical decision support system will contribute to the sharing and deploying of knowledge and to the dissemination of standardized clinical guidelines through the reuse of this knowledge

References

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❖ Address for correspondence

- Center for Interoperable EHR, Annex Building, Seoul National University College of Medicine, 199-1 Dongsoong-Dong, Jongno-Gu, Seoul, 110-810, Korea, *Kijii90@snu.ac.kr*