A new approach to medical and clinical knowledge management by using the Medical Cells strategy

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Abstract
The authors previously designed managing and sharing medical information units called “Medical Cells”. The authors measured clinicians' satisfaction with the Medical Cells, and experiences with the performance of the Medical Cells within an existing electronic medical record system. The Medical Cells were useful in obtaining correct medical knowledge, and had a significant impact on managing and sharing medical information within the EMRS.

Introduction
With the growth in popularity of the World Wide Web, clinicians are now able to access the latest medical knowledge contained in such databases as MEDLINE and the Cochrane Library over the web. However, concerns still exist regarding gaps in the knowledge base of clinicians who lack information management skills relevant to clinical practice1. In Japan, some studies suggested that there was a lack of understanding regarding clinicians' information needs and concerns, e.g., the lack of time to search for information, and the absence of needed information2. To help address this issue, we designed an information management and sharing system using “Medical Cells”, which clinicians can use to share appropriate medical information. A “Medical Cell” is an individual object unit, defined as the minimum distribution unit of medical knowledge.

Methods
We designed the Medical Cells in a portal software architecture using an object-oriented XML-based database system. In this system, we verified the efficacy of the Medical Cells that were downloaded to, and displayed on, an EMRS. The subjects consisted of twenty-three clinicians who participated in the trial. Clinicians were given a scenario, and asked to use the EMRS according to the following procedure: (1) check a model patient’s clinical record in the EMRS before downloading the Medical Cells, (2) check the model patient’s clinical record in the EMRS after downloading the Medical Cells that contained the relevant medical and emergency information. After this performance, we measured clinician satisfaction with the Medical Cells using a questionnaire. In addition, we interviewed clinicians about the Medical Cells downloaded into the EMRS.

Results
Clinician satisfaction questionnaire: Regarding the Medical Cells downloaded into the EMRS, all questionnaire aspects were considered positive. Specifically, 96% of clinicians rated the usefulness of the Medical Cells as excellent or good.

Opinions: All clinicians strongly agreed that they would use the Medical Cells downloaded into the EMRS. In particular, the emergency information (such as new infectious diseases) downloaded into the EMRS was evaluated highly by all clinicians. One clinician commented that it was convenient to be able to display both the appropriate medical knowledge and patient medical records.

Conclusion
This study suggests that the Medical Cells can satisfy important information needs of busy clinicians by managing and sharing medical information within the EMRS. One study reported that the next objective of study for sharing and managing medical information had to be linking the documents library to the EMRS3. To promote the actual utilization of the Medical Cells, we plan to expand the number of contents that the Medical Cells covers (such as making diagnostic decisions).

References