

Comprehensive Process Model of Clinical Information Interaction in Primary Care: Results of a “Best-Fit” Framework Synthesis

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Abstract

Objective: To describe a new, comprehensive process model of clinical information interaction in primary care (Clinical Information Interaction Model, or CIIM) based on a systematic synthesis of published research.

Materials and Methods: We used the “best fit” framework synthesis approach. Searches were performed in PubMed, EMBASE, CINAHL, PsycInfo, Library and Information Science Abstracts, Library, Information Science & Technology Abstracts and Engineering Village. Two authors reviewed articles according to inclusion and exclusion criteria. Data abstraction and content analysis of 443 published papers was used to create a model in which every element was supported by empirical research.

Results: The CIIM documents how primary care clinicians interact with information as they make point-of-care clinical decisions. The model highlights three major process components: 1) context; 2) activity (usual and contingent); and 3) influence. Usual activities include information processing, source-user interaction, information evaluation, selection of information, information use, clinical reasoning, and clinical decisions. Clinician characteristics, patient behavior, and other professionals influence the process.

Discussion: The CIIM depicts the complete process of information interaction, enabling a grasp of relationships previously difficult to discern. The CIIM suggests potentially helpful functionality for clinical decision support systems (CDSS) to support primary care, including greater focus on information processing and use. The CIIM also documents the role of influence in clinical information interaction; influencers may affect the success of CDSS implementations.

Conclusion: The CIIM offers a new framework for achieving CDSS workflow integration and new directions for CDSS design that can support the work of diverse primary care clinicians.

Significance of the work for the WISH audience

The vast majority of healthcare in Western countries occurs via primary care, which is unique in its emphasis on providing continuous, comprehensive, and coordinated care. Clinical decision support systems (CDSS) can use interactive technology to bring critical knowledge to patient care decisions. However, the majority of CDSS have been designed for inpatient settings, and are typically too inflexible to address the complexity and time constraints of primary care. CDSS also fail to address the real problems that primary clinicians have, are poorly integrated into their workflow, and fail to address the needs of all types of primary care providers (e.g., nurse practitioners and physician assistants in addition to physicians). Design of more robust CDSS for primary care clinicians requires a stronger theoretical foundation, particularly regarding *how* diverse clinicians interact with information at the point of care, as they make clinical decisions. This study introduces the CIIM, an empirically grounded process model of information interaction in primary care. The CIIM differs from prior conceptual literature in that it is empirically grounded and permits a more complete view of the process. Of great interest to the WISH community, the CIIM suggests potentially helpful new functionality for CDSS to support primary care. The CIIM highlights important clinical interactions that have received little intervention attention to date, such as: (1) information processing; design possibilities include sorting, highlighting and organizing information in ways that appropriately direct clinicians’ attention and reduce their cognitive load; (2) information evaluation: designing to support positive evaluations of quality information; and (3) information use: providing information for a wide range of assessments, such as the probability of disease, and potential treatment efficacy/harm. The CIIM also documents the role of social influence, highlighting potential design strategies that incorporate social influence to improve care quality (e.g. representing respected specialists’ opinions on a treatment decision). In summary, the CIIM offers CDSS a framework for achieving workflow integration and for future research, and directions for designs supporting information interactions of diverse primary care clinicians.

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