Investigators have tried various approaches to link clinical information directly to information sources that may contain answers to clinical questions. Developing a model of clinical information needs that may arise in the context of viewing information about a specific patient is a preliminary step to finding an efficient, useful solution to the information retrieval problem. This poster illustrates a method of modeling clinical information needs in the context of a specific patient that is adapted from entity-relationship models used in database design.

INTRODUCTION
Cimino reviewed approaches to linking questions arising in the context of specific patient information to bibliographic sources that might contain answers to those questions. In his review, he presented an information model that divides the task into three components: identifying the question, identifying the appropriate information source, and composing the retrieval strategy (1). Cimino has also presented work using generic queries (2) and the hierarchical links, semantic links, and translation abilities of a controlled medical terminology (3) for automated information retrieval. Clearly, creating automated links from patient information to bibliographic resources is a challenging problem. A model of the information needs that might arise in the context of patient-specific information may facilitate creating those links.

PROPOSED MODEL
We propose modeling the patient as an entity that has attributes and relationships to other entities, as is shown in Figure 1. Questions may arise directly from related entities or from relationships between entities. For example, if a patient is taking medication A, the user may have questions about the medication itself, such as known complications. If a patient is taking medication A for disease B, and also has disease C, the user may want to know whether the dose of medication A should be altered in the presence of disease C. In this case, the question derives from an instance of a particular medication combined with an instance of a particular patient who also has the characteristic of having disease C. Thus the question arises primarily from the relationship "takes medication" between a patient entity and a medication entity.

DISCUSSION
This model can be used to represent various types of questions that may arise in the context of viewing patient-specific information such as can be found in an electronic medical record. Validation of the model will require demonstrating that this model can be used to represent the spectrum of information needs that arise in clinical settings. Its usefulness will be demonstrated if the model can promote automated formulation of patient-centric queries that retrieve information useful for patient care and for patient-focused medical education.

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References