

# Consistency of Structured Data Elements: Challenges and Approaches

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## Introduction/Background

A lack of consistent shared data definitions across electronic health record (EHR) applications and clinical settings prevent reuse and interoperability of healthcare data. EHR data collection forms defined without reference models compromise information consistency and completeness. Many EHR implementation projects are quite large with limited interaction between individuals responsible for distinct applications within the EHR system.<sup>1</sup> These limited interactions may lead to decreased sharing of data definitions and an increase in the number of distinct data elements defined to represent similar topics.<sup>2</sup> In order to increase consistency of data definitions within similar topics, it is necessary to define a set of standard data elements to be shared across the organization. This poster will describe our process for defining a standard set of data elements (Reference Model) for the Clinical Topic of Pain.

## Methods

We convened a workgroup of informaticians, project analysts, and clinical subject matter experts (SME) to analyze the consistency of structured data element definitions for a set of clinical topics across our Partners eCare EHR configuration project. Our analysis included: 1) literature review, 2) development of a draft reference model based on literature review findings, 3) evaluation of downstream data dependencies for draft reference model, 4) modified Delphi voting by SMEs using eRoom<sup>(c)</sup> collaboration software to validate reference model, and 5) prioritization of changes to the system to align with validated reference model.

## Results

Literature review retrieved relevant LOINC models, Intermountain Healthcare's Clinical Element Model (<http://www.clinicalelement.com/#/>), and two peer-reviewed publications.<sup>3,4</sup> The draft Pain Reference Model included 21 data elements. Round 1 SME voting resulted in the removal of 4 data elements, addition of 6, and modification to 11 data elements. Validated model results will be included in the printed poster.

## Discussion/Conclusion

Defining reference models is resource intensive but delivers value in achieving data consistency.<sup>2</sup> A lack of consistent data definitions will have downstream implications on EHR features such as clinical decision support and reporting.<sup>5</sup> Pain is one example of a topic ripe for standardization of data capture. We see the definition of Reference Models for clinical topics and prioritization of changes to the existing system as a continuous process for EHR optimization. This work will be continued for other prioritized clinical topics that are used across diverse settings of care and specialties and with significant downstream data dependencies.

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## References

1. Bakken S, Cimino JJ, Hripesak G. Promoting patient safety and enabling evidence-based practice through informatics. *Med Care*. 2004;42(2 Suppl):II49-56. doi:10.1097/01.mlr.0000109125.00113.f4.
2. Los RK. Supporting Uniform Representation of Data: Structuring Medical Narratives for Care and Research. 2006.
3. Dorflinger LM, Gilliam WP, Lee AW, Kerns RD. Development and application of an electronic health record information extraction tool to assess quality of pain management in primary care. *Transl Behav Med*. 2014;4(2):184-9.
4. Schenck A, Rokoske F, Durham D, Cagle J, Hanson L. Quality measures for hospice and palliative care: piloting the PEACE measures. *J Palliat Med*. 2014;17(7):769-75. doi:10.1089/jpm.2013.0652.
5. Rosenbeck KH, Randorff Rasmussen A, Elberg PB, Andersen SK. Balancing centralised and decentralised EHR approaches to manage standardisation. *Stud Health Technol Inform*. 2010;160(Pt 1):151-155.