Structured or Unstructured? Options for Clinician Data Entry in the EHR

by Susan H. Fenton, MBA, RHIA

There are many different ways to get clinical data into an electronic health record (EHR), including feeds from machines, traditional transcription of documents, and emerging technologies such as speech recognition. The form of data entry an organization chooses will be one of the most important decisions it makes. Will clinician data entry be structured or unstructured? There are distinct differences between the two, and advantages and disadvantages to each.

Structured Data Entry

Structured data entry largely involves the use of forms and other tools to enter information.[1] Forms or computer entry screens include defined data elements or fields, some of which may be mandatory, some of which may be optional. Often the content entered into the different fields is specified via lists or a predefined vocabulary. Sometimes the system will intelligently follow the data entry and, based on what is entered, determine the next fields needing completion.[2]

Structured data entry has its advantages. It is easier to ensure that required data are captured, and data reliability is improved, since the content in the fields is limited. It is often less complicated to retrieve consistent data from a limited, structured set.

However, it is often more difficult to design efficient structured data entry because the process is different from the familiar ways that clinicians have historically recorded their data. Another significant disadvantage is loss of clinical detail, which occurs whenever data entry is limited.[3]

Unstructured Data Entry

Unstructured data entry is the recording of data in free text or natural language. A discharge summary is largely free text in that the content is not limited and clinicians can enter whatever they want. However, each organization has a template, or layout, for its discharge summary to help organize the free text so it is more easily understood.

As might be expected, structured data entry's weakness are unstructured data entry's strengths. The level of data detail entered is determined by the clinicians entering the data. They can enter as much or as little as they desire. This is also true of many of the historical, manual methods of clinical data entry. Thus, unstructured data entry can be as efficient as historical data entry methods.

Unstructured data entry has its disadvantages. Because it exercises less control over what data are recorded, the reliability of the content is lower and required data may not be present. It also requires complicated tools to assist in data retrieval.

An unstructured clinical note must be parsed, or split, into computer-processable chunks. It requires use of a formal ontology--a description (like a formal specification of a program) of the concepts and relationships that can exist for an agent or a community of agents, in this instance healthcare.[4] The ontology assigns meaning to the parsed document, helping organize the data for retrieval, assign codes, or insert the data into a structured data repository.

Is One Better?

Whether an organization chooses structured or unstructured data entry depends upon the purpose of the data entry and the eventual uses of the data. Data entry acceptable for administrative purposes may not be adequate for clinical processes. Organizations must carefully investigate data entry when considering an EHR. Questions to ask about all data entry tasks include:

- Why is the organization entering these data? Is it for patient care? To secure payment? To comply with a regulation?
- What data need to be entered?
- Who will enter the data? Will it be clinicians, nurses, ancillary staff, clerks, or a combination? What will be the most efficient method for each type of user?
- Under what circumstances will users enter data? Will they be rushed, or will they have adequate time? What will be the setting (admissions, emergency room, intensive care unit, patient's home)?
- What use does the organization expect to make of the data? Will they be used for patient care, reimbursement, quality improvement, research?

Ultimately, each organization will need to make its own carefully considered decision when selecting data entry methods for its EHR.

Notes

1. van Bemmel, J.H., and M.A. Musen, eds. *Handbook of Medical Informatics.* Vol. 3.3. Rotterdam, Netherlands: Erasmus University and Stanford University, 1999.
2. Ibid.
3. Ceusters, W. *Language, Medical Terminologies, and Structured Electronic Patient Records: How to Escape the Bermuda Triangle.* Belgian Medical Informatics Association, 2005.
4. Gruber, T.R. "A Translation Approach to Portable Ontologies." *Knowledge Acquisition* 5 no. 2 (1993): 199-220.

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