Using SNOMED in an implementation of Epic Wisdom

A revised module for out patient dental care developed for and with the assistance of HealthPartners, A Minnesota USA based health care system.

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Critical elements and people:

- Epic- a large health care electronic records system vendor supplying the base for information model development

- Intelligent Medical Objects (IMO) the terminology service used by HealthPartners and coordinating with the Epic team and model

- HealthPartners Dental with critical contributions to terminology and information model design by:
  - Dr. Don Worley
  - Mr. Charles Huntley

Who is HealthPartners?

- A regional health care system based in Minnesota, USA serving 750,000 members.

- Established 1957

- 80+ medical clinics owned and operated by HealthPartners/Park Nicollet

- Two large hospitals in the Minneapolis-St. Paul region plus smaller ex urban hospitals

- 21 dental clinics owned and operated by HealthPartners seeing zz thousands of patients each year and employing aa dentists

Dentistry and terminologies

▶ Dental clinicians do an excellent job documenting what they did, but, only infrequently, document why they did it, patient status or expected outcome.

▶ Many SNOMED member countries have and use procedure code systems to document what was done for a patient, to allow for billing, etc., but usually using a set of terms not based on or in SNOMED.

▶ Disorders, other findings, observables, and other SNOMED terms are rarely used in dentistry, even today.

▶ To a very limited degree, Norway, Britain, the Netherlands, and Canada have used some diagnosis terms and coding. New Zealand anticipates use of the GD refset in 2018.

Dentistry and terminology in the USA

- Uses a procedure code set, Current Dental Terminology (CDT), owned by the American Dental Association and universally used in the USA.

- Unlike medical care (different insurance programs than dental) where diagnosis codes (ICD10) are required for submitting claims for payments, dental clinics are rarely required to use diagnostic coding when submitting claims to dental insurance companies.

- Some dental schools have begun to use dental diagnostic terms in teaching students and are building up a common data warehouse. (Big Mouth at the University of Texas, Houston campus)

HealthPartners Dental

- Like all of dentistry in the USA, HealthPartners (HP) uses CDT codes to document procedures provided and for submitting insurance claims

- Unlike others, HP has used diagnosis codes at its 21 clinics for 12+ years

- Proprietary code system of approx. 650 terms.

- HP dental clinics regularly access information available in the Epic medical system

- One of the most integrated models in the USA

Why an Integrated Record?

- HealthPartners belief that oral health is part of overall health

- IT department maintaining a separate dental system (an additional expense)

- Dental clinicians regularly use information from medical system

- Potential to improve understanding of oral/overall health connections

- Potential to more effectively coordinate care

- Potential to provide more personalized decision support tools

- Latter three directly related to use of common terminology (SNOMED CT)

Disadvantages of the Integrated Record

- Epic had limited experience in dental records systems
- Dental specific systems could deliver better workflow
- Some loss of control over terminology (IMO/EPIC requirements for terminology)
- Some loss of desired features due to limitations created by current medical system information model

Value to Dental Clinicians

- Immediate access to medical history, problem lists, lab results and medication lists

- Potential to better control opioid prescription use

- Improves patient safety by providing enhanced and current information (example: Medical History reported to dentists is often different and less complete)

- Care coordination for specific conditions: Chronic pain, TMD, Facial pain, sleep disorders, some surgeries, some disorders such as Sjogren's

- Ability to populate problem list and provide physician notifications

Why SNOMED?

- Covers a broad range of health care disciplines, potentially creating greater learning possibilities

- Organization familiarity

- Terminology Service firm familiarity (IMO)

- Broad coverage of dental needs

- Similarity to proprietary terms

- Few reasonable options

Similarity between SNOMED and Previous System

- Previous system is mostly disorders, a few findings, and a few "treatment justification" codes
  - i.e. "tooth needs dental sealant", "full coverage recommended due to weak tooth"
- Many 1:1 matches with almost exact language
- Previous system terms served as Interface with clinicians
- Previous system had 648 terms. In any given year, less than 300 were used three or more times (total) by the 100+ clinicians

Determining 1:1 matches

- Exact language match or acceptable synonym within SNOMED was considered an exact match

- Small panel of clinicians determined if "meaning" was the same, when no exact language match or exact language match to synonym.

- Two significant areas of change in disease classification in the dental community since proprietary codes were developed, dental caries and periodontal diseases. Desire to move towards new classification, which were already incorporated in SNOMED CT.

- Going forward, all terms will be SNOMED except for a select few "procedure justification" terms

What about 1:many and many:1? How were those dealt with?

▶ Direction of map is important for HealthPartners Research

▶ Clinically, the switch to SNOMED eliminates internal mapping going forward

▶ Clinically, history searches would bring up all 1:many matches (SNOMED: Previous system).

▶ Infrequent use of searches is anticipated.

▶ For research purposes going forward, comparing SNOMED to previous, previous terms will be aggregated (this will be tested in the next few months)

▶ Where more than one SNOMED term might fit a previous term, a small group is reviewing each instance and will then confirm with clinicians and specialty clinicians, if needed.

The EPIC/IMO intersection and how it impacts the dental system

- Because of the logic of the information model, there are limitations to the terms available within IMO.

- i.e. Cannot place procedures into key parts of this model and a few instances would have benefitted from this. Helpful when multiple visits are required to finish a procedure.

- Problem list development and maintenance limited IMO terms primarily to disorders.

- Dental clinicians can only populate problem list with very specific and limited conditions due to integration with total medical record.

Comparing Proprietary to SNOMED CT

▶ 265 concepts in proprietary system were mapped to SNOMED CT

▶ 139 were exact matches, synonyms, or evaluated as matches

▶ 43 were mapped to the new disease classifications and had very close matches already in the proprietary system, thus it is thought there will be little degradation of historical data in these areas.

▶ 54 concepts were partial matches which included Many to one, where several proprietary terms map to a single SNOMED CT term.

   ▶ Small numbers of use each year, will monitor for any data degradation, but clinicians feel that none of this impacts clinical decisions.

▶ 29 terms from the proprietary system were "aggregators" where one proprietary term could include several SNOMED concepts.

   ▶ Example: "Other red lesions of mouth"

The role of the Terminology service

▶ IMO is critical to managing the integration into the information model so that information exchange and coordination between medical and dental takes place in an acceptable manner for all clinicians

▶ Developing the proper pick lists for smart notes will be essential to development of decision support tools within the dental module

▶ If specific historical searches become necessary, IMO will again be a key to proper design

▶ In the future, if we move into form development for input into the information model, IMO will be a key contributor, as many of the eventual recommendations for decision support will be post coordinated terms and IMO will need to provide the various terms that fit into the model (dental caries example)

Beyond disorders, using the power of SNOMED

▶ Development of smart notes

▶ Limitation of pick lists situationally

▶ This will result in structured data and searchable data

▶ Significant input into design and available terms from specialist community

▶ Necessary to put these smart notes into progress notes, rather than specific entry formats, due to design of information model

Developing Decision Support

- Direct dental decision support must rely heavily on smart notes. Understanding the findings and observables is key to supporting a diagnosis

- Integration with medical history, labs and medications was previously done through a different application readily available to dental clinicians. Use was limited to very specific circumstances, such as use of sedation during dental treatment.

- Alerts that are known to impact dental care, decisions on and whether to treat will be based initially on best available information (i.e. when to highlight an alert from a person's known medical history, medication use, labs, etc. to inform dental clinician prior to beginning treatment.

- Testing care coordination between medical and dental is still in its early stages, again based on what current evidence supports.

Opening a new frontier

- ▶ Little use of Diagnostic codes in dentistry in the USA

- ▶ Now adding findings, morphologic abnormalities, observations, etc.

- ▶ This should lead to decision support development in dentistry (now very limited)

- ▶ Growing, but still limited understanding of oral/overall health connection. Hundreds of thousands of patients visits may provide some clarity

- ▶ The SNOMED relationships will be critical to this improved understanding