EZCodes, a Dental Diagnostic Terminology for the Electronic Health Record

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Which diagnoses led to the choice of three different restorations?
EZCodes in EHR

Select Clinical Diagnosis

Category
- ABNORMALITIES
- CARIES/LOSS
- ENDODONTICS
- PERIODONTICS
- ANATOMIC ABNOR
- ORAL PATHO/RADIO
- PAIN/ALTERED SEN
- HARMFUL HABITS
- OCCLUSION DISOR
- DEFECTIVE RESTOR
- TRAUMA/FRACTURES
- TEMPOROMANDIBULAR
- REMOVABLE PROSTH
- ESTHETICS
- NO TERM ASSIGNED

Quick List
- Pulpal Diagnosis
- Secondary pulpal conditions
- Periapical diagnosis
  - Normal apical tissues
  - Asymptomatic apical periodontitis
  - Symptomatic apical periodontitis
    - Acute apical abscess
    - Chronic apical abscess
    - Fistula
  - Secondary periapical condition
  - Fractures
Development Process

1. Discussion & Consultation
2. Develop Structure
   - ABE & AAP
   - Z Codes
   - ICD 9/10
3. Draft EZ Codes
4. 2 Rounds Review
5. Workgroup Consensus
6. COHRI review & Vote
7. Final EZ Codes

Kalenderian, E. et al, The Development of a Dental Diagnostic Terminology, JDE 2011 (1);75:68-76
Distribution of EZ Codes Sources

- Oral Health Related ICD 9/10 (479, 40%)
- Z codes (611, 51%)
- ABE Diagnoses (30, 3%)
- AAP Diagnoses (75, 6%)
- Overlap Z code & Specific ICD 9/10 (139, 12%)
Method: Controlled Terminology (CT)

Term: Mulberry Molar  
Definition: Shape alteration of tooth  
Identifier: EZ840069  
Synonym: Moon’s molar teeth

Term: Xerostomia  
Definition: Dry mouth  
Identifier: EZ494038  
Synonym: Hyposalivation, Asialorrhea, Asialia
Design: Interface Terminology

Improve Usability:

• Assertional medical (dental) knowledge
• Synonyms
• Balance between pre-and post coordination
• Mapping to ICD and SNOMED
Reference Terminology: SNOMED-CT:

EZCodes submitted to complete oral health terms

• 15 terms accepted
• 40 terms forwarded to the IHTSDO
• 63 terms require clarification: in process
• 12 terms rejected:
  – 4 terms already exist in SNOMED
  – 8 terms have quantitative modifiers e.g., “Arthrogenous TMD pain (“Arthralgia”) ≤ 12 weeks
Entering diagnostic terms in the EHR should be easy! By learning from the dentist in the clinic we can craft best practices, which will:

- Increase dentist satisfaction with the Dx term entry process
- Increase utilization of diagnostic terms
- Reduce error rates in the entry of diagnostic terms

Results YTD:

- **Validation** has been completed

- **Utilization** of EZCodes can be improved
  - Assessing the Use of a Standardized Dental Diagnostic Terminology in an EHR. Tokede O, et al. JDE, in press

- **Mapping** has been completed: ICD, SNOMED, CDT
- **Annual Revision** Process
The EZCodes Revision Process

Direct feedback from users of the EZCodes dental terminology

Analysis of ‘use’/validity of use of the EZCodes at 3 centers

Clinicians’ satisfaction survey at 4 centers that use the EZCodes

Content experts: Oral diagnosis/Periodontics/Caries/Endodontics

EZCodes review workgroup meets to discuss and accept, reject, or modify feedback received

Removal of redundant and antiquated concepts
Inclusion of ICD/SNOMED terms that have finer granularity

Diagnostic terms re-organized based on drawn up sorting principles

EZCodes 2013
Pre-coordination and assertional knowledge

Dentin Defect; Genetic disorder of teeth commonly exhibiting an autosomal dominant inheritance and is characterized by presence of normal enamel but atypical dentin with abnormal pulpal morphology

Dentin Dysplasia
Radicular Dentin dysplasia
Rootless tooth

K00.5 - Dentinogenesis imperfecta
Clinical Decision Support – Mapping to CDT

- Pulpal Diagnosis
  - Secondary pulpal conditions
  - Periapical diagnosis
    - Normal apical tissues
    - Asymptomatic apical periodontitis
      - Symptomatic apical periodontitis
    - Acute apical abscess
    - Chronic apical abscess
    - Fistula
  - Secondary periapical condition
  - Fractures

- Procedure
  - CDS: Pulp selection
    - Therapeutic pulpotomy
    - Pulpal debridement
    - Endodontic therapy
    - Endodontic retreatment
    - Apicoectomy
    - Retrograde filling - per root
    - Palliative Tx - dental pain
    - Extraction erupted tooth
    - Surgical removal of erupted tooth

- Expert

- Diagnosis
- Procedure
- Details
Insurance Billing – Mapping to ICD
EZCodes Implementation

- ACTA
- Creighton
- HSDM
- Indiana University
- OHSU
- Temple
- UCSF
- U. of Illinois, Chicago
- University of Michigan
- U. of Minnesota
- U. of Oklahoma
- U. of Tennessee
- UT Houston
- Midwestern U.
- U. Florida
- Willamette Dental Grp.
- Children’s Hosp. Boston

1,909,557 Patient visits
3,707 Providers
Benefits of EZCodes Terminology

• **Provider**
  - Influence quality of care – become diagnostic centered
  - Improve communication: w/patients; between providers
  - Usability of an interface terminology

• **Patients/Population**
  - Identification and tracking of high need groups
  - Disease surveillance
  - Assess trends in nation’s health

• **Research**
  - Synthesize literature; compare across cultures/countries
  - Identification and tracking of best practices
  - Tracking of clinical outcomes

Interface with ADA158

• The EZCodes terminology can be included into ADA158
• The EZCodes terminology can be mapped to ADA158
• Certain EZCodes terms can supplement ADA158
Questions and Comments?

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