



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

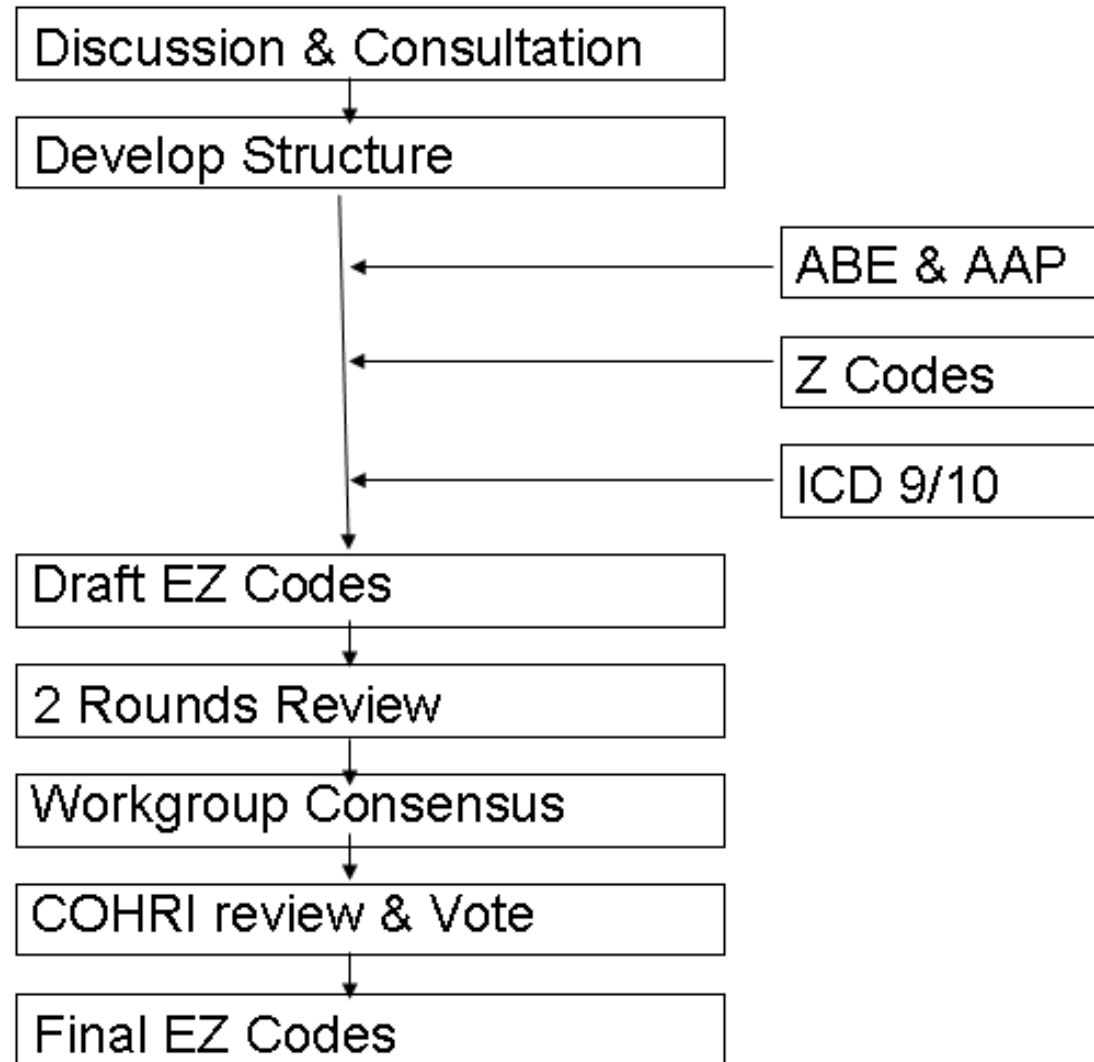
The screenshot shows a software window titled "Select Clinical Diagnosis" with a close button in the top right corner. The window is divided into two main sections. On the left is a list of categories, with "ENDODONTICS" selected. On the right is a tree view of diagnoses under the "Quick List" tab, with "Symptomatic apical periodontitis" highlighted.

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

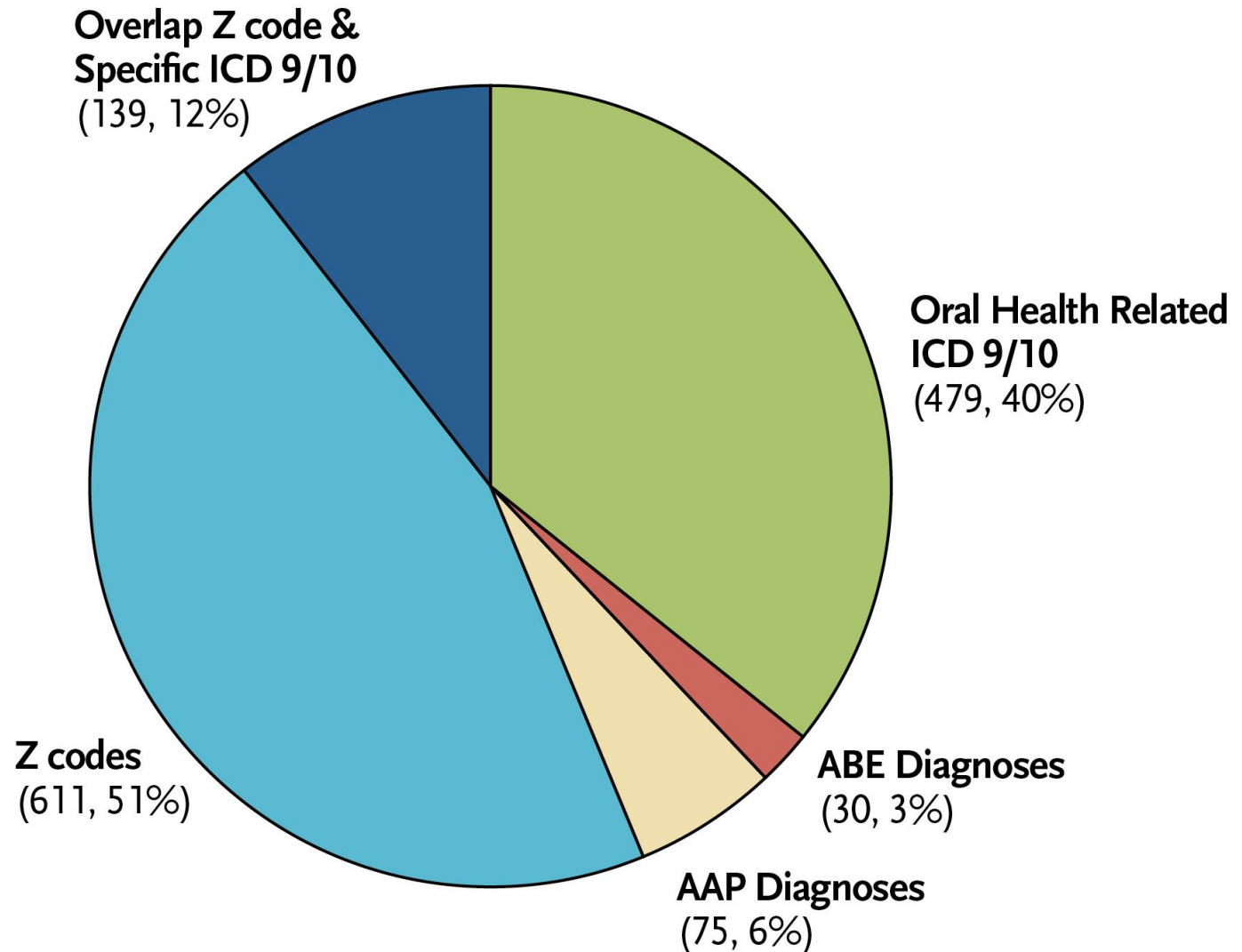
Quick List Full List Search

- + 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



Distribution of EZCodes Sources



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

R01 Research

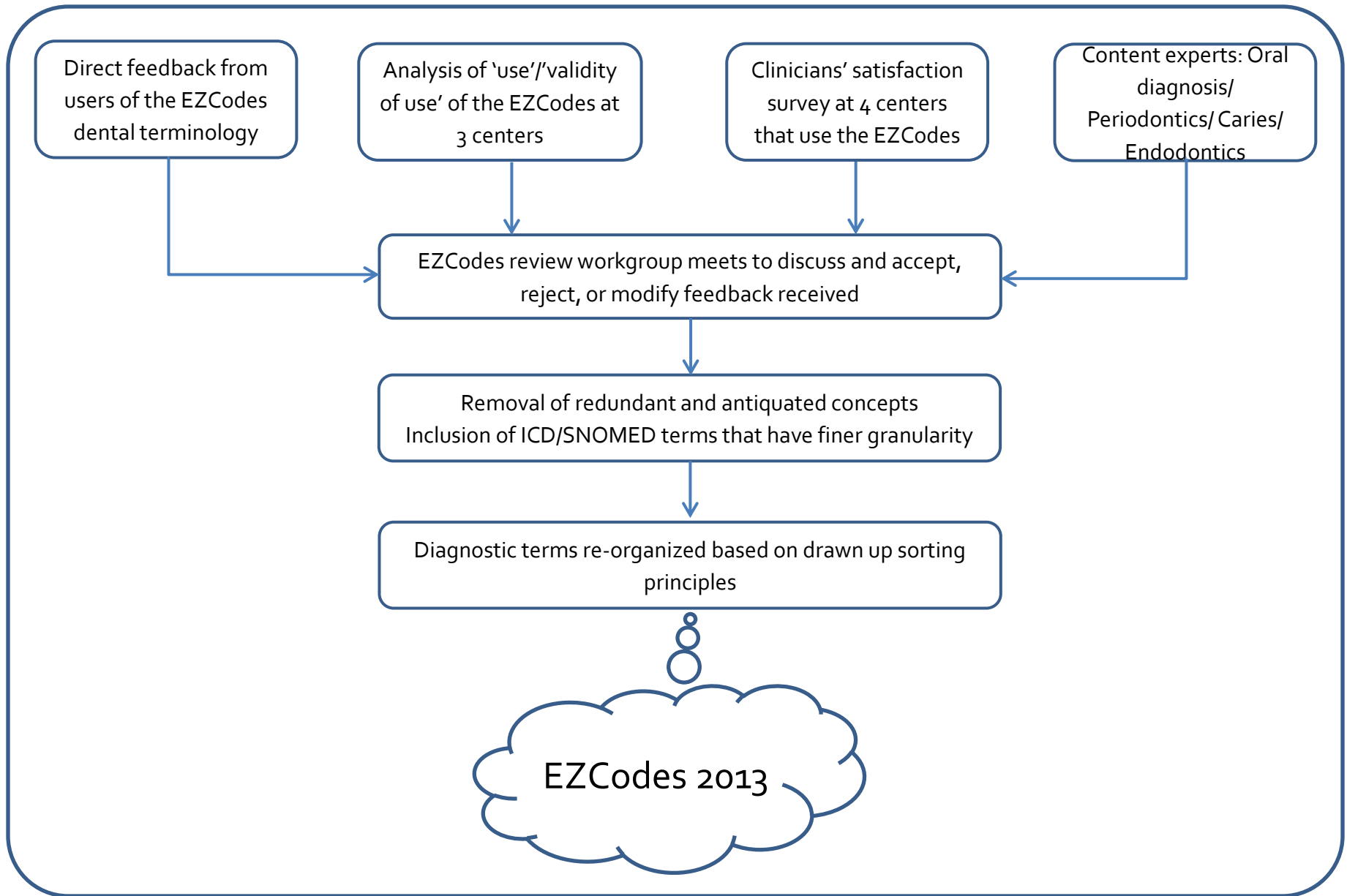
Entering diagnostic terms in the EHR should be **easy**! By learning from the dentist in the clinic we can craft **best practices**, which will:

- **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
 - Evaluating a Dental Diagnostic Terminology in an Electronic Health Record. White JM, et al. JDE; 75(5):605-615, 2011
- **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



Pre-coordination and assertional knowledge

The screenshot shows a software window titled "Select Clinical Diagnosis" with a list of categories on the left and a list of specific diagnoses on the right. The "Dentin Dysplasia - Shield I" option is selected. A pop-up window provides detailed information for this selection.

Select Clinical Diagnosis

Category

- ABNORMALITIES
- CARIES/LOSS
- ENDODONTICS
- PERIODONTICS
- ANATOMIC ABNOR
- ORAL PATHO/RADIO
- PAIN/ALTERED SEN
- HARMFUL HABITS
- OCCCLUSION DISOR
- DEFECTIVE RESTOR
- TRAUMA/FRACTURES
- TEMPOROMAN
- REMOVABLE P
- ESTHETICS
- NO TERM ASSI

Quick List Full List Search

- + Enamel Defect
- + Enamel and Dentin Defect
- Dentin Defect
 - Dentinogenesis imperfecta (Shell Teeth)
 - Dentinogenesis Imperfecta - Shield I
 - Dentinogenesis Imperfecta - Shield II
 - Dentinogenesis Imperfecta - Shield III
 - Dentin dysplasia
 - Dentin Dysplasia - Shield I
 - Dentin Dysplasia - Shield II

ABNORMALITIES OF TEETH

Dentin Defect

Dentin Dysplasia - Shield I

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

Dentinal dysplasia

Radicular Dentin dysplasia

Rootless tooth

K00.5 - Dentinogenesis imperfecta

Clinical Decision Support – Mapping to CDT

Diagnosis **ENDODONTICS** Procedure **CDS: Pulp selection**

<ul style="list-style-type: none"><input type="checkbox"/> Pulpal Diagnosis<input type="checkbox"/> Secondary pulpal conditions<input checked="" type="checkbox"/> Periapical diagnosis<ul style="list-style-type: none">Normal apical tissuesAsymptomatic apical periodontitisSymptomatic apical periodontitisAcute apical abscessChronic apical abscessFistula<input type="checkbox"/> Secondary periapical condition<input type="checkbox"/> Fractures	<ul style="list-style-type: none">Therapeutic pulpotomyPulpal debridementEndodontic therapyEndodontic retreatmentApicoectomyRetrograde filling - per rootPalliative Tx - dental painExtraction erupted toothSurgical removal of erupted tooth
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Expert | Diagnosis | Procedure | Details

Insurance Billing – Mapping to ICD

ADA American Dental Association® Dental Claim Form

HEADER INFORMATION

1. Type of Transaction (Mark all applicable boxes)
 Statement of Actual Services Request for Predetermination/Pretauthorization
 EPOSDT / Title XIX

2. Predetermination/Pretauthorization Number

CLAIM#: 0010952

INSURANCE COMPANY/DENTAL BENEFIT PLAN INFORMATION

3. Company/Plan Name, Address, City, State, Zip Code
 CIGNA KE (GREAT WEST DENTAL)
 PO BOX 97313
 BELLEVUE WA 98009

POLICYHOLDER/SUBSCRIBER INFORMATION (For Insurance Company Named in #3)

12. Policyholder/Subscriber Name (Last, First, Middle Initial, Suffix), Address, City, State, Zip Code
 CLARK, ALAN
 1231 220 OAK STREET
 CHALMETTE LA 70044

13. Date of Birth (MM/DD/CCYY) 14. Gender 15. Policyholder/Subscriber ID (SSN or ID#)
 05/27/1988 M F 141415263

16. Plan/Group Number 17. Employer Name
 122 DOMINO'S PIZZA

PATIENT INFORMATION

6. Date of Birth (MM/DD/CCYY) 7. Gender 8. Policyholder/Subscriber ID (SSN or ID#)
 M F

9. Plan/Group Number 10. Patient's Relationship to Person named in #5
 Self Spouse Dependent Other

11. Other Insurance Company/Dental Benefit Plan Name, Address, City, State, Zip Code

18. Relationship to Policyholder/Subscriber in #12 Above
 Self Spouse Dependent Child Other

19. Reserved For Future Use

20. Name (Last, First, Middle Initial, Suffix), Address, City, State, Zip Code
 CLARK, ALAN
 1231 220 OAK STREET
 CHALMETTE LA 70044

21. Date of Birth (MM/DD/CCYY) 22. Gender 23. Patient ID/Account # (Assigned by Dentist)
 05/27/1988 M F 1286

RECORD OF SERVICES PROVIDED

24. Procedure Date (MM/DD/CCYY)	25. Area of Oral Cavity	26. Tooth System	27. Tooth Number(s) or Letter(s)	28. Tooth Surface	29. Procedure Code	29a. Diag. Pointer	29b. Qty.	30. Description	31. Fee
11/23/2012			4		D7110	A	01	SINGLE TOOTH	62.00

34. Diagnosis Code List Qualifier B (ICD-9 = B; ICD-10 = AB)

34a. Diagnosis Code(s) A K03.8E C _____

(Primary diagnosis in "A") B K02.3 D _____

36. I hereby authorize and direct payment of the dental benefits otherwise payable to me, directly to the below named dentist or dental entity.

X Patient/Guardian Signature _____ Date 11/23/2012

X Subscriber Signature _____ Date 11/23/2012

BILLING DENTIST OR DENTAL ENTITY (Leave blank if dentist or dental entity is not submitting claim on behalf of the patient or insured/subscriber.)

48. Name, Address, City, State, Zip Code
 ROBINS TRAINING SCHOOL

49. NPI 50. License Number 51. SSN or TEI
 _____ 2087 250148754

52. Phone Number (604) 553-5555 53a. Additional Provider ID 2087

40. Is Treatment for Orthodontics?
 No (Skip 41-42) Yes (Complete 41-42)

41. Date Appliance Placed (MM/DD/CCYY)

42. Months of Treatment Remaining 43. Replacement of Prosthesis
 No Yes (Complete 44)

44. Date of Prior Placement (MM/DD/CCYY)

45. Treatment Resulting from
 Occupational Illness/Injury Auto accident Other accident

46. Date of Accident (MM/DD/CCYY) 47. Auto Accident State

TREATING DENTIST OR TREATMENT LOCATION INFORMATION

54. NPI 55. License Number 2087

56. Address, City, State, Zip Code 56a. Provider Specialty Code
 1011 N UNIVERSITY AVE
 ANN ARBOR MI 481091078

57. Phone Number (734) 763-3311 58. Additional Provider ID 2087

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

Leake, J.L., et al, A system of diagnostic codes for dental health care. J Public Health Dent, 1999. 59(3): p. 162-70.

Verdonschot EH, et al. Developments in caries diagnosis and their relationship to treatment decisions and quality of care. 1997. Caries research. 1999;33(1):32-40.

Pitts NB. Clinical diagnosis of dental caries: a European perspective. J Dent Educ. 2001; 65(10):972-8. Rosenbloom ST Interface Terminologies JAMIA 2006; 13(3):277-88

Ettelbrick KL, et al. Hospital charges for dental caries related emergency admissions. Pediatric dentistry. 2000; 22(1):21-5.

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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