EZCodes, a Dental Diagnostic Terminology for the Electronic Health Record

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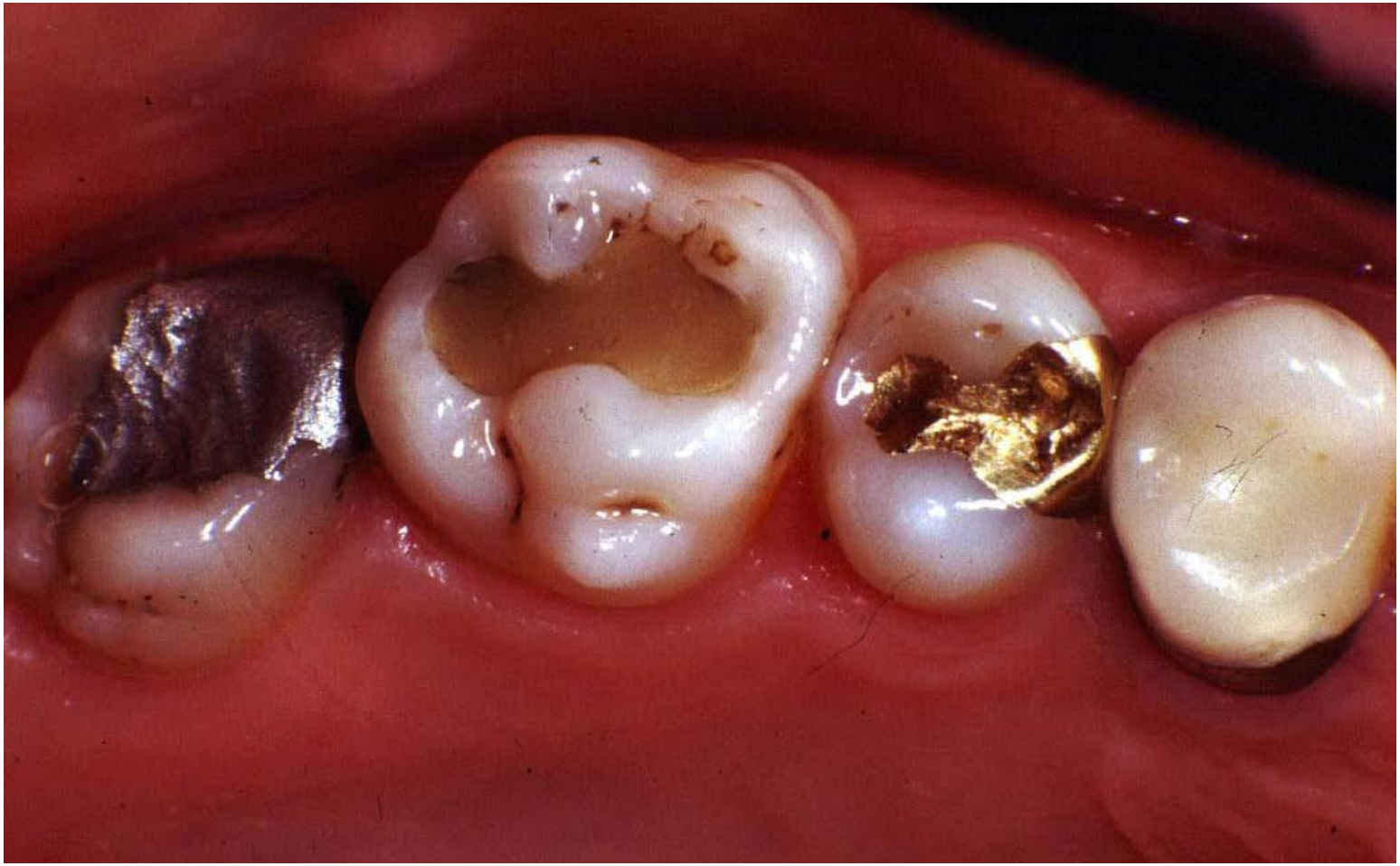
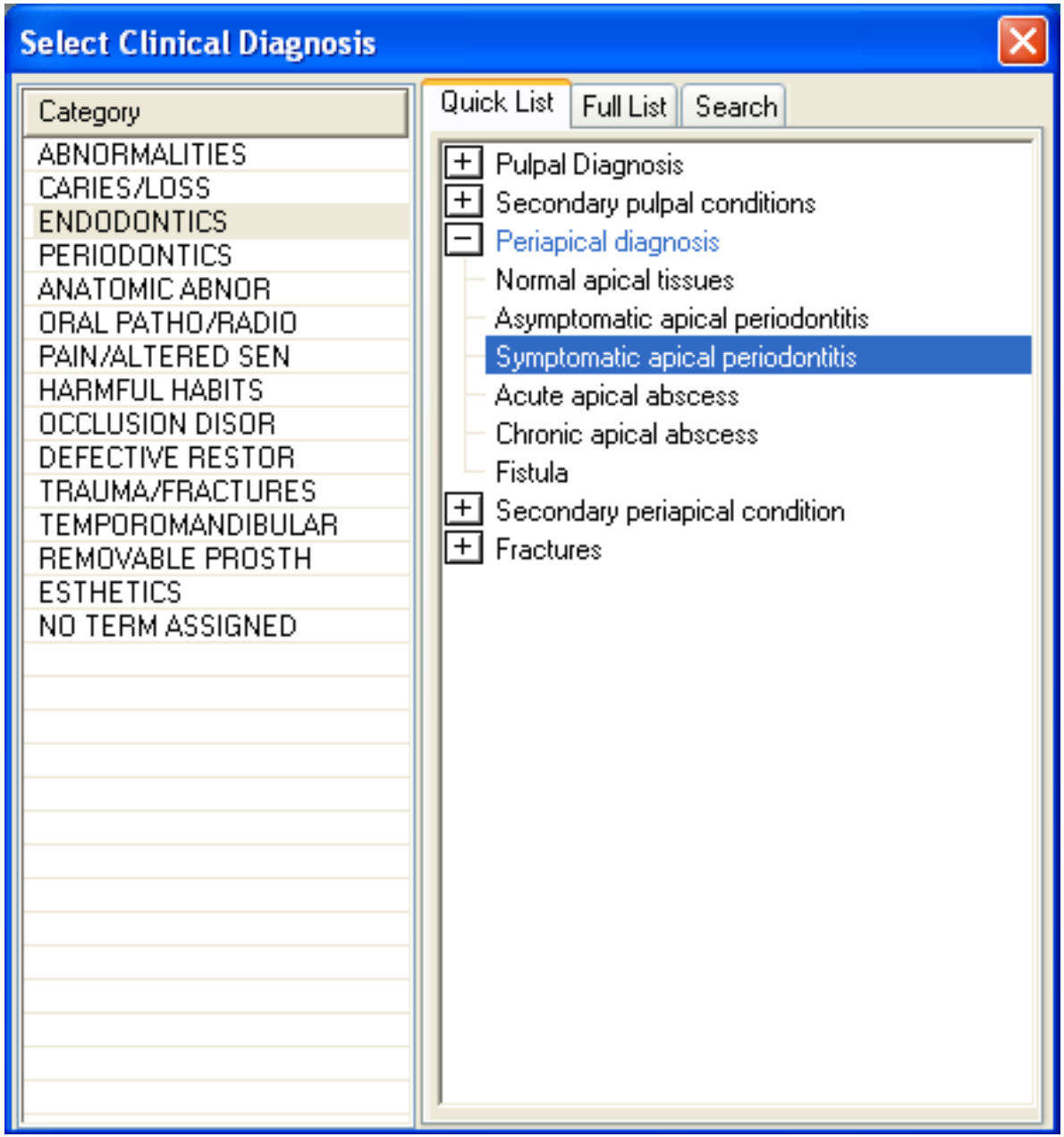
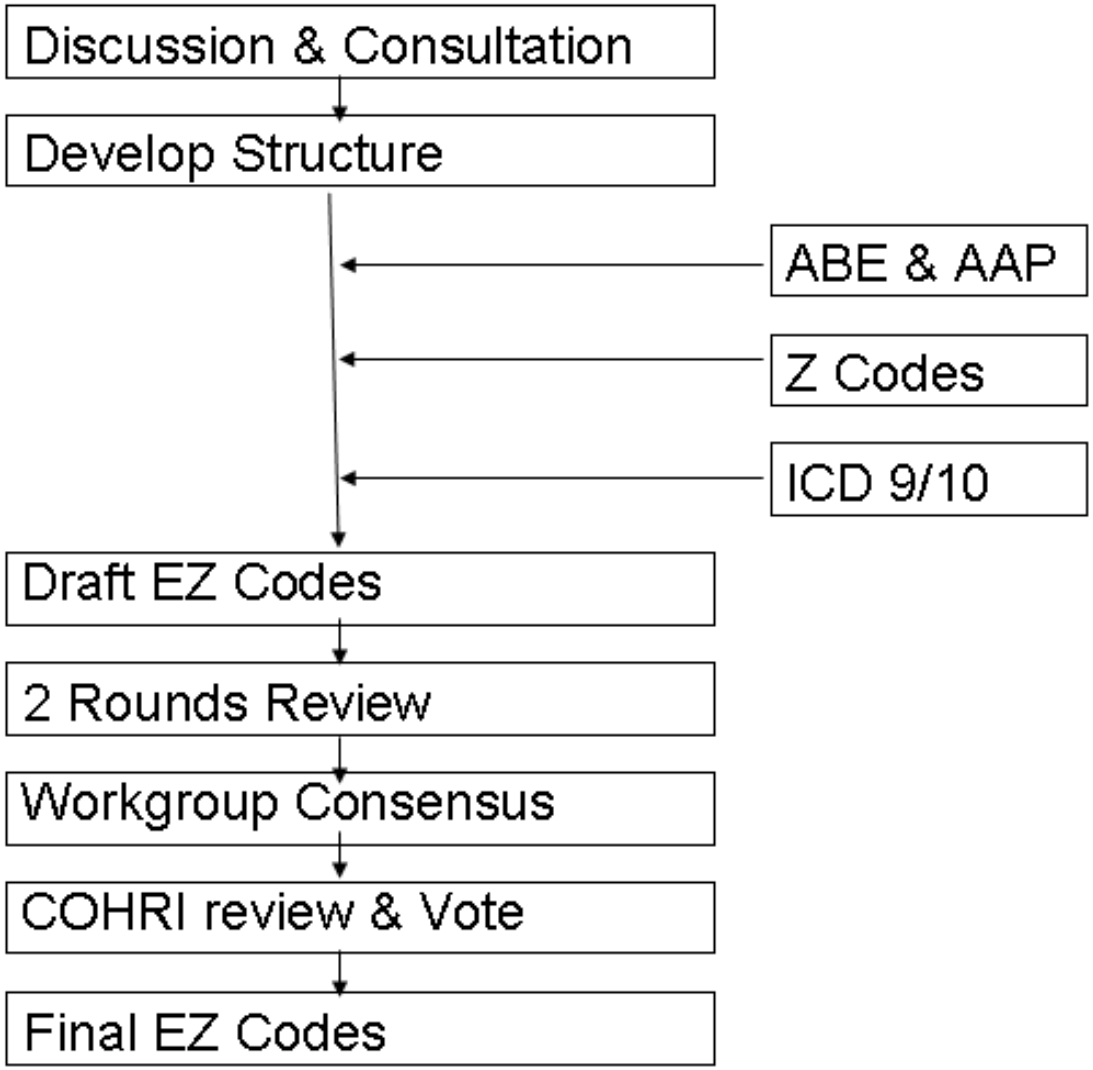
Which diagnoses led to the choice of three different restorations?



EZCodes in EHR

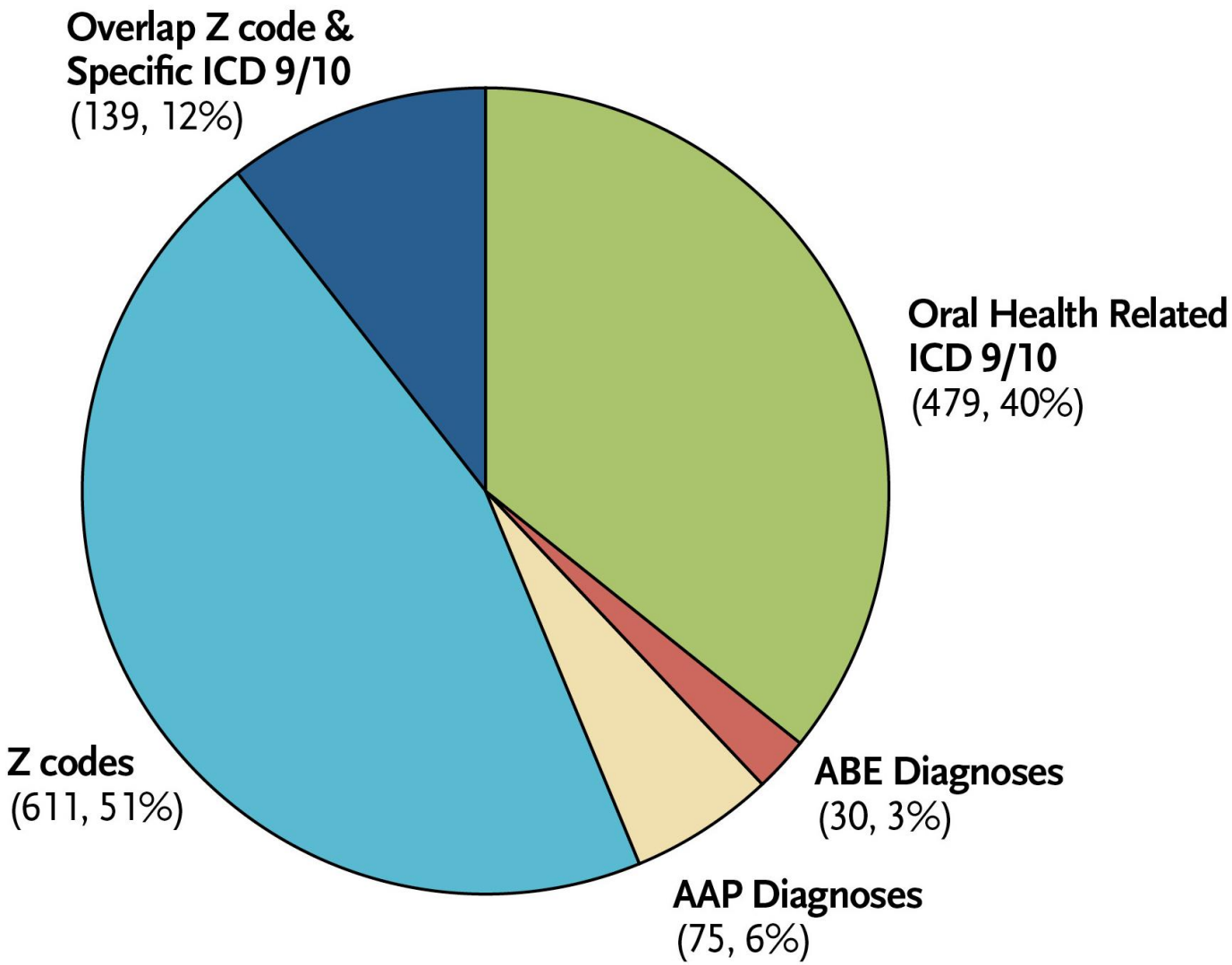


Development Process



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

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

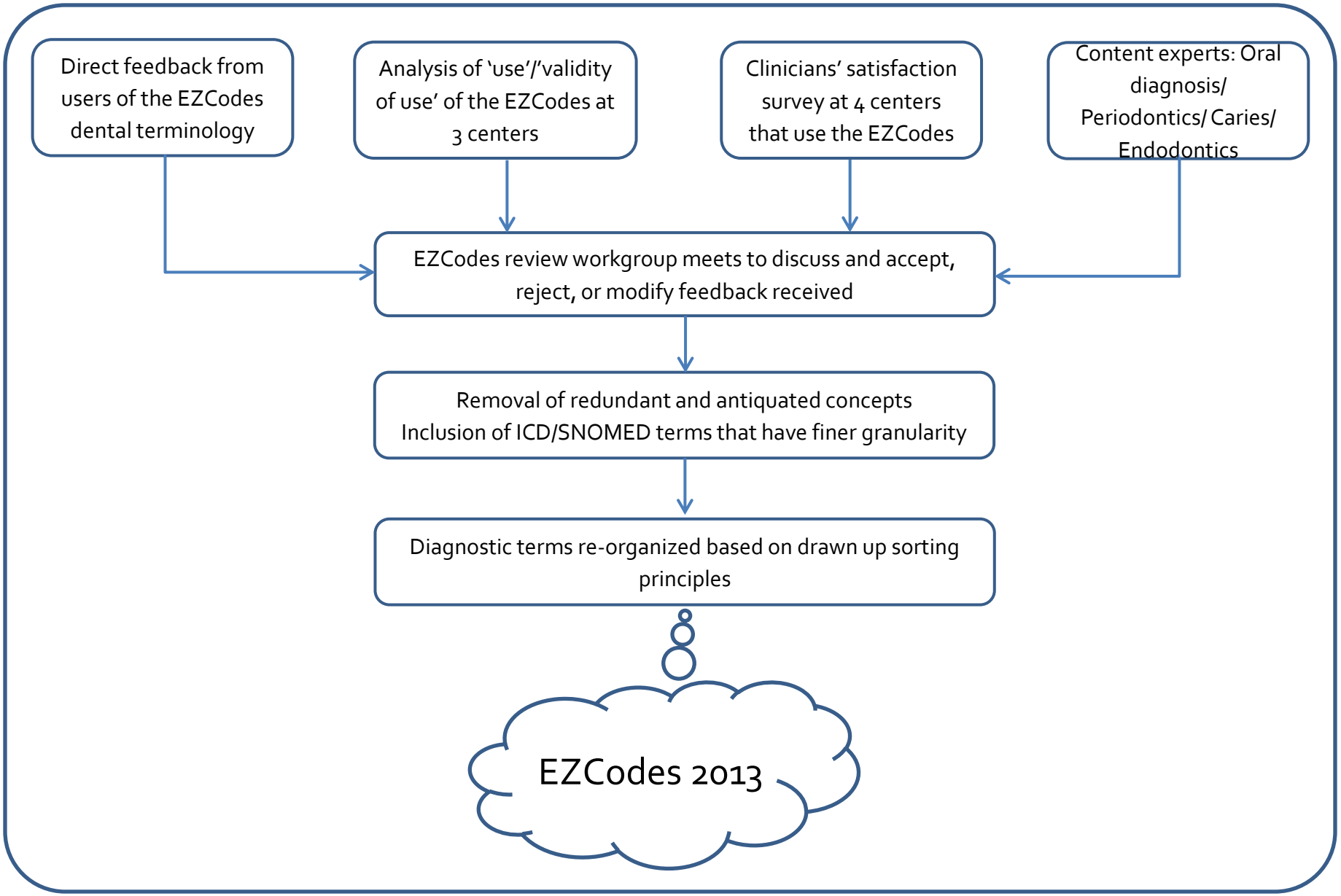
Entering diagnostic terms in the EHR should be easy! By learning from the dentist in the clinic we can craft best practices, which will:

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

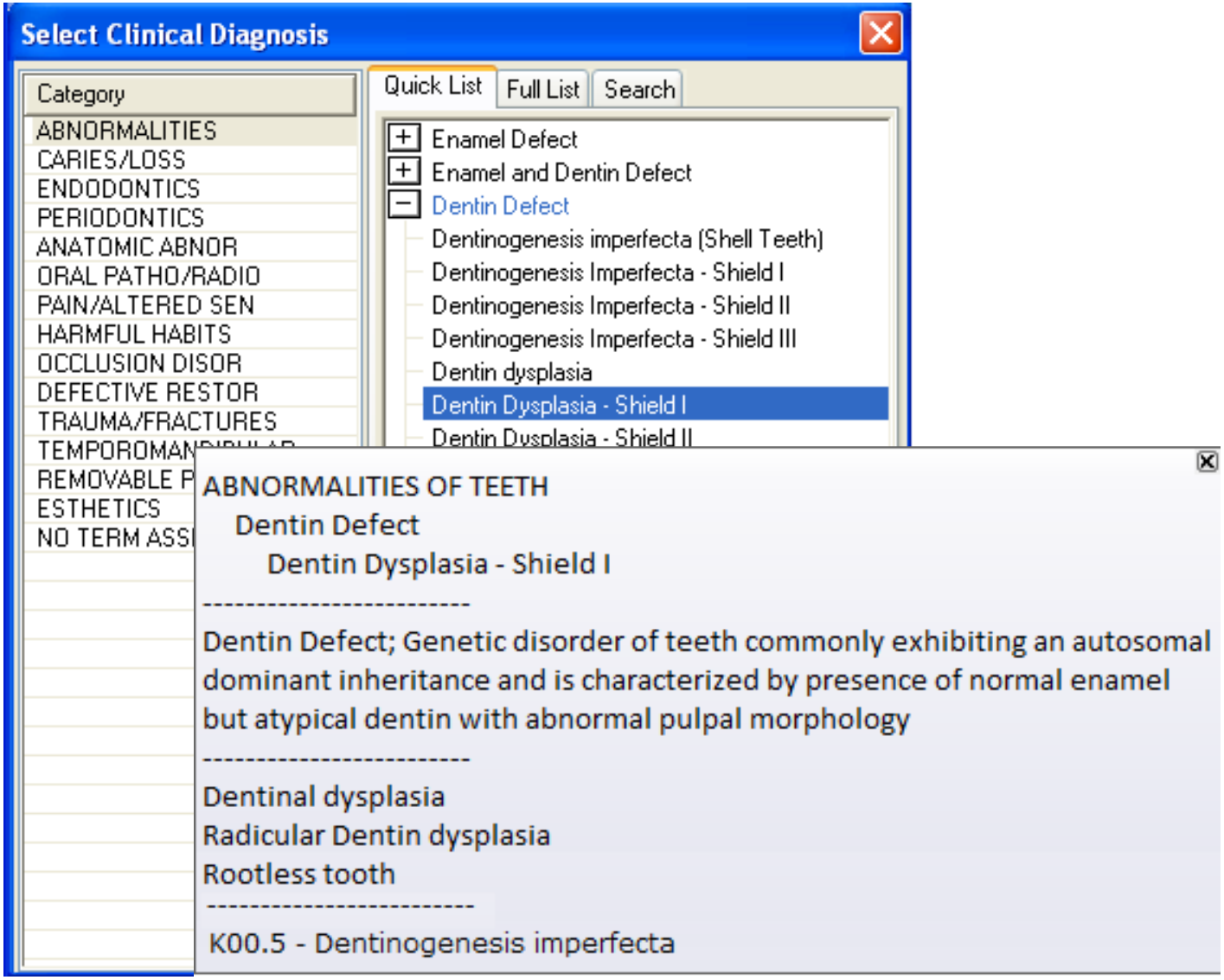
Results YTD:

- 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



Clinical Decision Support – Mapping to CDT

Diagnosis: ENDODONTICS

- [+] 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

ADA American Dental Association® Dental Claim Form

CLAIM#: 0010952

HEADER INFORMATION

1. Type of Transaction (Mark all applicable boxes)
[X] Statement of Actual Services [ ] Request for Predetermination/Preauthorization
[ ] EPSDT / Title XIX

2. Predetermination/Preauthorization Number

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

OTHER COVERAGE (Mark applicable box and complete items 5-11. If none, leave blank.)

4. Dental? [ ] Medical? [ ] (If both, complete 5-11 for dental only.)

5. Name of Policyholder/Subscriber in #4 (Last, First, Middle Initial, Suffix)

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

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

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): 05/27/1988 | 14. Gender [X] M [ ] F | 15. Policyholder/Subscriber ID (SSN or ID#): 141415263

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

PATIENT INFORMATION

18. Relationship to Policyholder/Subscriber in #12 Above [X] 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): 05/27/1988 | 22. Gender [X] M [ ] F | 23. Patient ID/Account # (Assigned by Dentist): 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
1	11/23/2012			4		D7110	A	01	SINGLE TOOTH	62.00
2										
3										
4										
5										
6										

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

34a. Diagnosis Code(s) (Primary diagnosis in "**A**")
A K03.8E
B K02.3
C
D

law, or the treating dentist or dental plan has a contractual agreement with my plan prohibiting all or a portion of such charges. To the extent permitted by law, I consent to your use and disclosure of my protected health information to carry out payment activities in connection with this claim.
X 11/23/2012
Patient/Guardian Signature Date

37. I hereby authorize and direct payment of the dental benefits otherwise payable to me, directly to the below named dentist or dental entity.
X 11/23/2012
Subscriber Signature Date

40. Is Treatment for Orthodontics? [X] No (Skip 41-42) [ ] Yes (Complete 41-42) | 41. Date Appliance Placed (MM/DD/CCYY)

42. Months of Treatment Remaining | 43. Replacement of Prosthesis [X] 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

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: 2087 | 51. SSN or TIN: 250148754

52. Phone Number: (604) 555-5555 | 52a. Additional Provider ID: 2087

TREATING DENTIST AND TREATMENT LOCATION INFORMATION

53. I hereby certify that the procedures as indicated by date are in progress (for procedures that require multiple visits) or have been completed.
X ROBINS TRAINING SCHOOL 11/23/2012
Signed (Treating Dentist) Date

54. NPI | 55. License Number: 2087

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

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

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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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