原文題目(出處)：	Prediction of periapical status and tooth extraction
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報告日期：	2017/7/4

內文：

Aim
1. Using PAI(Periapical index) to evaluate tooth prognosis.
2. Consider other factors that might affect tooth prognosis.

Material & Method
1. In 1997-1998,randomly select 616 individuals underwent a full-mouth radiography survey(14 periapical,2 bitewing) & interview information.
2. In 2003-2004 and in 2008-2009 re-invited those individuals attended a new radiographic examination & interview information,respectively.
3. There were 330 persons who attended all three examination(group1),143 persons who attended first and second examination only(group2).
4. The predictive value of the factors was described by mutually adjusted odds ratios with 95% confidence intervals.
5. An odds ratio larger than 1 indicates that the predictive factor was associated with an increased risk of poorer outcome.

Predictive factor

Table 1 Categorization of predictive factors

Parameters	Categories[a]
Person specific	
Gender	Female, male
Age	20–39, 40–49, 50–59, 60+
Smoking	No, yes
Group	Group 1 (three registrations), group 2 (two registrations)
Period	1997–2003, 2003–2008
Number of teeth	≤23, 24–25, 26–27, 28
Tooth specific	
Primary carious lesion	No (caries or caries in enamel), yes (caries in dentine)
Secondary carious lesion	No (caries or caries in enamel), yes (caries in dentine)
Periapical Index (PAI)	PAI 1 (normal periapical structures), PAI 2 (small changes in bone structure), PAI 3 (changes in bone structure with some mineral loss), PAI 4 (apical periodontitis with well-defined radiolucent area), PAI 5 (severe apical periodontitis with exacerbating features) (Ørstavik et al. 1986)
Restoration	No restoration, adequate (radiographically sealed filling or crown), inadequate (radiographic signs of overhangs or open margins of filling or crown)
Marginal bone level	<3 mm, 3–4 mm, >4 mm
Root filling	No, root filling material in the root canal
Root filling, length	≤3 mm from apex, >3 mm short or overfilling
Root filling, voidsl	No or few voids, extensive voids
Tooth group	Anterior (incisors and canines), premolars, molars
Jaw	Maxilla, mandible

Result

Primary factors:

-For both root filled teeth and non-root filled teeth, the baseline PAI score was the most important predictive factor. A high baseline PAI score increased the risk for an impaired outcome.

-Non-root filled teeth had in general a better outcome than root filled teeth.

Table 2 Baseline PAI scores and outcome PAI scores stratified according to the absence (a) of presence (b) of a root filling

Baseline	Follow-up							
	PAI 1	PAI 2	PAI 3	PAI 4	PAI 5	ex.	non-reg.	Total
(a)								
PAI 1	19 123	166	217	37	24	85	25	19 677
PAI 2	143	19	19	1	3	6	0	191
PAI 3	21	1	64	6	5	26	0	123
PAI 4	4	0	9	6	4	6	0	29
PAI 5	2	0	5	1	3	4	0	15
Total	19 293	186	314	51	39	127	25	20 035
(b)								
PAI 1	361	17	75	14	3	16	2	488
PAI 2	51	8	24	5	0	2	0	90
PAI 3	103	14	147	35	15	35	1	350
PAI 4	16	1	30	32	9	18	0	106
PAI 5	5	0	4	12	14	11	1	47
Total	536	40	280	98	41	82	4	1081

Excluded: 17 transitions for which the PAI at baseline could not be registered.

↑ The baseline distribution of the PAI scores in the non-root filled teeth showed that 98% had PAI score 1 at baseline. For the root filled teeth, the corresponding percentage was 45%.

Reference tooth:

Table 5 Predicted probability distribution of the outcome for a reference tooth, which has the following baseline characteristics: PAI 1, group 1, period 1, female, no smoking, age 20–39 years, 28 teeth, no primary or secondary caries, no restoration, marginal bone level <3 mm, lower incisor

Tooth type	PAI 1	PAI 2	PAI 3	PAI 4	PAI 5	Extracted
Nonroot filled teeth	99.84%	0.05%	0.07%	0.01%	0.01%	0.02%
Root filled teeth	97.34%	0.52%	1.75%	0.24%	0.06%	0.09%

In Non-root filled teeth

Besides PAI

caries lesions, marginal, coronal restorations, tooth groups(molar bad outcome)

significant influence on the outcome.

Table 3 Nonroot filled teeth: Mutually adjusted associations between predictive factors and outcome
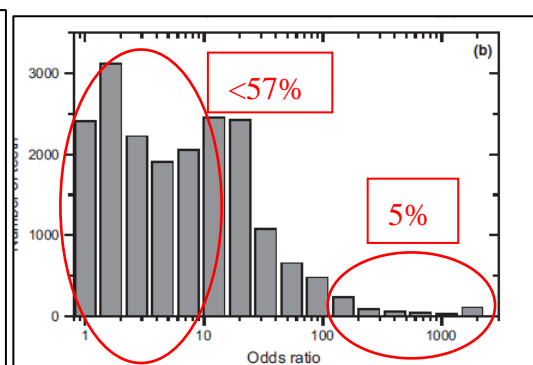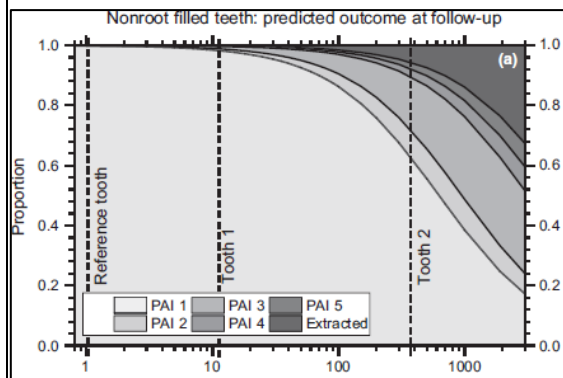
Nonroot filled teeth			
Variable	OR	95% CI	P-value
Baseline PAI (ref: PAI 1)			
PAI 2	4.47	2.97 6.72	<0.0001
PAI 3	26.42	16.83 41.47	<0.0001
PAI 4	47.10	19.42 114.20	<0.0001
PAI 5	53.69	26.42 109.08	<0.0001
Primary caries (ref: no)			
Yes	4.94	3.36 7.26	<0.0001
Secondary caries (ref: no)			
Yes	2.10	1.35 3.26	0.001
Marginal bone level (ref: <3 mm)			
3–4 mm	1.38	1.07 1.79	0.013
>4 mm	4.41	3.35 5.80	<0.0001
Restoration (ref: none)			
Adequate	2.81	2.03 3.90	<0.0001
Inadequate	3.43	2.22 5.29	<0.0001

Jaw and tooth group (ref: mand. anterior)			
mand. premolar	1.08	0.60 1.95	0.804
mand. molar	5.68	3.63 8.89	<0.0001
max. anterior	1.65	1.00 2.72	0.051
max. premolar	3.29	2.04 5.31	<0.0001
max. molar	3.38	2.13 5.37	<0.0001
Gender (ref: female)			
Male	1.11	0.90 1.38	0.339
Age category (ref: 20–39)			
40–49 years	1.30	0.95 1.77	0.100
50–59 years	1.27	0.89 1.82	0.182
60 + years	1.14	0.68 1.91	0.614
Smoking (ref: no)			
Yes	1.26	0.99 1.59	0.055
Number of teeth (ref: 28 teeth)			
≤23 teeth	2.43	1.66 3.55	0.000
24–25 teeth	1.24	0.91 1.69	0.175
26–27 teeth	1.18	0.90 1.56	0.234
Group (ref: group 1)			
Group 2	1.43	1.04 1.96	0.027
Period (ref: 1997–2003)			
2003–2008	1.35	1.09 1.68	0.006

Adjusted odds ratios (OR) with 95% confidence intervals from ordered logistic regression of 19348 (96.7%) transitions.

Tooth 1 is identical to a reference tooth except for age category (50–59 years), restoration (adequate) and tooth group (maxillary premolar);

Tooth 2 is identical to Tooth 1 except for PAI (PAI 3) and restoration (inadequate).

Nonroot filled teeth: predicted outcome at follow-up

In root filled teeth

The baseline PAI score influenced the outcome significantly

apart from the PAI score few variables had a significant predictive value.

Table 4 Root filled teeth: Mutually adjusted associations between predictive factors and outcome

	Root filled teeth			
Variable	OR	95% CI		P-value
Baseline PAI (ref: PAI 1)				
PAI 2	2.30	1.45	3.64	<0.0001
PAI 3	5.10	3.77	6.90	<0.0001
PAI 4	13.75	8.44	22.40	<0.0001
PAI 5	31.74	17.49	57.61	<0.0001
Primary caries (ref: no)				
Yes	2.09	1.37	3.19	0.001
Secondary caries (ref: no)				
Yes	0.68	0.42	1.08	0.099
Marginal bone level (ref: <3 mm)				
3–4 mm	1.00	0.72	1.39	0.990
>4 mm	1.56	1.07	2.28	0.021
Restoration (ref: none)				
Adequate	0.98	0.38	2.57	0.975
Inadequate	1.53	0.56	4.21	0.406
Jaw and tooth group (ref: mand. anterior)				
mand. premolar	2.90	0.58	14.40	0.192
mand. molar	13.22	3.06	56.99	0.001
max. anterior	5.10	1.12	23.23	0.035
max. premolar	7.40	1.66	33.07	0.009
max. molar	9.79	2.14	44.87	0.003
Gender (ref: female)				
Male	1.38	1.05	1.82	0.020
Age category (ref: 20–39)				
40–49 years	1.05	0.70	1.58	0.823
50–59 years	1.22	0.81	1.84	0.335
60 + years	1.18	0.69	2.02	0.551
Smoking (ref: no)				
Yes	1.11	0.81	1.52	0.532
Number of teeth (ref: 28 teeth)				
≤23 teeth	1.06	0.69	1.62	0.794
24–25 teeth	1.13	0.75	1.71	0.546
26–27 teeth	1.03	0.74	1.41	0.876
Group (ref: group 1)				
Group 2	1.10	0.76	1.59	0.618
Period (ref: 1997–2003)				
2003–2008	1.21	0.89	1.65	0.214

Adjusted odds ratios (OR) with 95% confidence intervals from ordered logistic regression of 1038 (96.4%) transitions.

These teeth had an increased risk of a worse outcome.
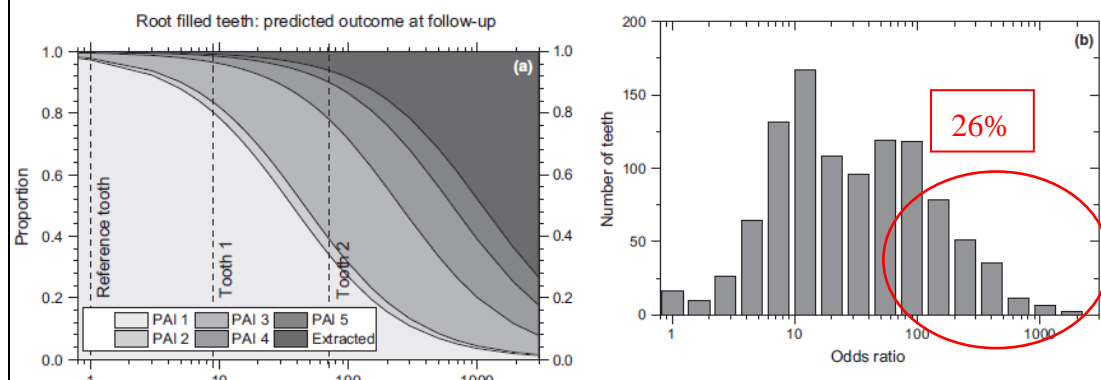
※**Root filling quality :**may indicate that the association between root filling

quality and the periapical status(see table1).

※Caries and marginal periodontitis, and other factors were associated with a worse

outcome in both root filled and non-root filled teeth.

-Caries:

gateways of bacteria infecting the pulp space.

-Reduced marginal bone level:

bacteria or metabolic substances originating from the infected pulp tissue may

spread through dentinal tubules to the marginal periodontal tissue, or that

marginal inflammation may progress to the apical area.

-Quality of a restoration.

-Molars and maxillary premolars.

multi rooted teeth have a higher risk of a worse periapical status compared to teeth with only one root canal.

※person-related factors were of less predictive value than tooth-related factors.

However, it was found that smoking was a significant predictive factor for a worse outcome, in particular in relation to non-root filled teeth.

題號	題目
1	Which option is least likely to be concern when making a pulp & periapical tissue treatment plan? (A) History (B) Vitality of the pulp (C) Gingival condition (D) Radiographys
答案 (C)	出處：Cohen's Pathways of the pulp 10th P870
題號	題目
2	Which option below is least likely to be the reason that causes post-endo disease? (A) Perforations (B) Ledges (C) Coronal leakage (D) over fitting crown
答案 (D)	出處：Cohen's Pathways of the pulp 10th P890