Periodontal Prognosis

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Objectives

• To understand the prognosis classification schemes
• To apply prognosis categories to individual teeth and different clinical situations

What is prognosis?

• A *prediction* of the probable course, duration, and *outcome* of a disease based on a general knowledge of the pathogenesis of the disease and the presence of risk factors for the disease.

When do you establish a prognosis?

• Determined *after the diagnosis* is made, but *before the treatment plan* is formulated
• The initial prognosis should be reevaluated *after completion of each treatment phase.*

Expectation - we are not psychotic.
Periodontists will be asked if the tooth is able to be used for crown, abutment, etc. - based on the prognosis.
To make the correct expectation, you need to know the basic knowledge of the disease: pathogenesis and risk factors.

Even licensed dentists receive lectures about this and when to make the prognosis.

Initial prognosis will change based on treatment outcomes.
Some factors to consider when developing classifications:

1. What is the end point
2. Tooth mortality, tooth loss, stability of supporting tissues
3. Timing - short term and long term
4. *most importantly as general dentist is individual tooth vs. overall prognosis

We are only discussing two classifications, there are several
This one is from 1996. - published after Dr. Oh graduated.

McGuire Nunn Classification - based on tooth loss. Patient keeping tooth or not.
Five sub categories.
Would not see a perfect tooth exactly meeting the description.
- Need to use analytic thinking, not always seeing in patient's mouth exactly fitting this category. This is a general diagram for each case. Assign a tooth prognosis based on this and consistent with patient's mouth.

Memorize this for the final******!!!!!
Patient maintain tooth 99% is good
Hopeless - have to do more

Case: He doesn't say anything really major - no pain, etc. but wanted a new provider.
Periodontal evaluation shows:

Periodontal charting: Pay attention to tooth number 8:

Charting not quite right in this image: chart is way off. Not correct at all. Number 7 has deeper pocket depth. Everyone makes mistakes. Do evaluation first always then radiographs. Go back to confirm when discrepancies like this. Probe again
Assume number 7 is similar pocket depths with has similar attachment loss as 8.

Diagnosis first based on chart and radiographic evaluation: localized severe chronic periodontitis.

Then make a prognosis based on McGuire Nunn: need to make a decision whether you know or not, patient in the chair and wants to know what to do: Dr. Oh #7 = questionable - lots of support #8 = hopeless - she thinks #8 has a root fracture. To confirm root fracture, need to open it to see. Sometimes can tell on radiograph - so radiolucency. Hopeless because cannot repair root fracture.

Can see clear fracture line. This is an unusual expression of root fracture. She thinks root fracture because when see patient in clinical situation - no etiology, no plaque/calculus, gums look good. Radiograph - only 8 and 7 have bone loss compared to 9 and 10. That kind of bone loss is not really from periodontal etiology. Has to have more. Usually coming from endo. #8 has more circumferential bone loss. Bone loss on number 7 is from number 8, no difference between 7 and 9 clinically, but the severe bone loss spread.

Chief complaint - not pain or discomfort. Do you think he will accept removal of number 8?! No!
- McGuire Nunn has limitations! We assigned hopeless, but patient management wise, will not be accepted. Patient will think, “I have no pain. Why is it hopeless?”
- Tooth loss doesn’t occur naturally.

Baseline McGuire Nunn is very good.
More effective in first time users, restrictive. But not good for managing patients.

Problems related to the scheme by McGuire and Nunn
- The observation of tooth loss is definitive, but the follow-up time can be lengthy.
- Tooth loss usually does not occur naturally; it is merely the decision of the practitioner.
- Less useful for patient management.

Prognosis Scheme by Kwok & Caton
- Based on the probability of obtaining stability of the periodontal supporting apparatus.
- The observation of periodontal stability is dynamic and must be assessed periodically.
- Periodontal stability is influenced by many local and general factors that may be controlled.
It is not very user friendly. Need to know all treatment options and their success rates. Need to know how much you can achieve with one treatment and clinical skills. Once you are more experienced, can use this.

Dr. Oh uses this but initial prognosis she uses McGuire Nunn. This one is better in treatment planning.

McGuire Nunn is based on tooth loss.
Kwok and Caton is based on probability to achieve periodontal support.
When we start in clinic in June, we will use McGuire Nunn **remember the table**

Favorable - can control everything
Questionable - maybe, maybe not

Need to see many cases and experience and know success rate of each procedure.

Short term - easier to expect.
Usually five or more years is long term prediction.
McGuire Nunn good and hopeless are fairly accurate but others drop about 50%
Single root tooth, easy to assume what will happen compared to multi-rooted

Good prognosis categories were the most predictable

In clinic, with us as the clinicians, good is pretty much keeping tooth forever. Hopeless is pretty much fair and the remaining we don’t know

Predictability of Prognosis
- Prognostications on single-rooted teeth were more accurate than on multirooted teeth
- The good prognosis category was the most predictable.
- The poor and questionable categories were highly variable.
- The prediction of the hopeless category was quite reasonable.

Considerations for developing prognosis classification schemes
- Tooth Mortality vs The stability of supporting tissues
- The timing of the projection
  - short term vs long term
- The consideration of individual teeth vs the overall dentition

Prognosis for Individual Teeth and the Overall Dentition
- Periodontal disease does not progress uniformly throughout the dentition
- When general factors are considered, the individual tooth prognosis may need to be readjusted.
- Facilitating communication between professionals and patients

Overall Prognosis
- Concerned with the dentition as a whole
- answers following questions
  1. Should treatment be undertaken?
  2. Is treatment likely to succeed?
  3. When prosthetic replacements are needed, are the remaining teeth able to support the added burden of the prosthesis?

Considers dentition as one unit
Most importantly in Dr. Oh’s opinion for us is the third point

Normally, in general, need to determine individual tooth prognosis after overall health prognosis determined.
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Need to consider everything, not just periodontal conditions. Restorative and endodontics, too.

Local factors = pretty much about tooth condition

One of Dr. Oh's opinion of problems in clinic is maintenance isn't the issue, it is mainly too many providers for each patient here. Student providers focus is not the patient; main focus is graduation. Once you finish all the requirements, focus is most likely outside. Dr. Oh says, "please focus on patient until your last day".

If patient in good maintenance program, tooth loss is low.

Affects a lot periodontally and prognosis - outcomes in smokers are poorer than non-smokers.
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Diabetes mellitus
- Higher prevalence of periodontal disease and greater attachment and bone loss in DM patients
- Decreasing polymorphonuclear leukocyte function
- Decreasing collagen production and increasing collagenase activity
- Compromised wound healing in uncontrolled DM patients
- Worsening the long-term periodontal prognosis

Deep probing depths - patient can't clean or brush well. Always associated with strong pathogens
Clearly has long term poorer prognosis example - mandibular furcations have dental caries. Mostly non-restorable when removing decay at furcation, sectioning the tooth. Need to remove the tooth.

In maxillary molars, higher chance to develop periodontal access and periodontal treatment not as effective.

Almost 10 mm pocket depth on both sides. When opened up, can see lateral growth. Can't make any attachments - deeper pockets. Treatment wise we will learn next year.

### Furcation Involvement
- Furcation-involved teeth had a poorer long-term prognosis.
- Tooth loss from FI
  - Dental caries
  - Periodontal abscess

### Trauma from Occlusion
- Traumatic forces combined with inflammation can cause increased bone loss.
- Occlusal adjustments improved attachment gains after surgical and nonsurgical treatments.
- Patients who had parafunctional without a night guard were more likely to lose teeth over the long term.

### The Effect of Tooth Mobility
- Pockets on clinically mobile teeth do not respond as well to periodontal therapy as pockets on non-mobile teeth.

### Individual Tooth Prognosis
- Periodontal status
- Restorability
- Endodontic condition
- Occlusal plane and tooth position
- Anatomic irregularities
- Iatrogenic compromising factors

Trauma combined with inflammation → increased bone loss

Patients with bruxism or grinding need night guard

Need to adjust occlusion
Amount of sound tooth structure affects restorability

*this is a question she tends to receive - #2 and 3, can you make a crown. Why would a crown be needed? What is the problem? - recurrent caries. 9 out of 10 dentists will say we don’t know until we remove the crown. Dr. Oh wants to try to have prognosis prior to removing - she thinks #2 we can make a new crown, #3 we can’t. Can you determine from radiograph, probably not.

Biologic width - need 2 mm of sound tooth structure
- #2 - non-restorable
- #3 - core build up and is manageable
- Need to think how much sound structure the tooth has and the risks to determine if savable. Will you have biologic width without removing the bone. Don’t want to open the furcations
What is the best option on the maxilla?
- This case has to be full denture - cannot make a stable partial with two second molars
- Partial - need abutment on each side, at least one on each side. Right side - the teeth are not restorable!
- This patient needs a full denture!
  - Ideally, this decision is made at the screening when the patient comes in for first time
  - This is not a perio patient!
  - Dr. Oh was able to make these decisions without looking at radiographs! The decisions made from prosthodontics not periodontal health

What about the mandible?
When we start to see real patients, start to think about this patient! Don't waste your time nor the patient's time with perio!

**Risk factors vs Prognostic factors**
- Risk factors are those characteristics of individual that put the person at increased risk for developing a disease.
- Prognostic factors are characteristics that predict the outcome of disease once the disease is present.
- In some cases, risk factors and prognostic factors are the same.

**Parameters used in assigning Prognosis**

<table>
<thead>
<tr>
<th>Individual tooth prognosis</th>
<th>Overall prognosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of bone loss</td>
<td>Age</td>
</tr>
<tr>
<td>Root surface</td>
<td>Medical status</td>
</tr>
<tr>
<td>Distribution and type</td>
<td>Individual tooth prognosis</td>
</tr>
<tr>
<td>Presence and severity of necrotic pulp</td>
<td>Rate of progression</td>
</tr>
<tr>
<td>Connect to root ratio</td>
<td>Extent of bone resorption</td>
</tr>
<tr>
<td>Root form</td>
<td>Economic considerations</td>
</tr>
<tr>
<td>Pulp involvement</td>
<td>Knowledge and ability of dentist</td>
</tr>
<tr>
<td>Caries</td>
<td>Biologic factors</td>
</tr>
<tr>
<td>Tooth position and occlusal relationship</td>
<td>Small defects and complications</td>
</tr>
<tr>
<td>Strategic value</td>
<td>Strategic value</td>
</tr>
<tr>
<td>Prognostic knowledge and skill</td>
<td>Strategic value</td>
</tr>
</tbody>
</table>

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Risk factor - disease not developed yet, but if have it, most likely to develop the disease.

Prognostic factor - has disease and this factor affects disease progression

DM is a risk and prognostic feature

*memorize this table
There will be a case in the final exam that is open ended question: mainly asking to assign prognosis of #8 based on these factors.

Ex. I say it is hopeless because it has 12% bone loss, etc.

Focusing on strategic value - not all teeth are as important
Four canine, four first molars = most important teeth in the mouth
Implants - used to want to save those teeth or if have money, can do full mouth restoration without dentures, but now can place implant wherever you want
Sinus tract - take a radiograph to determine which tooth causing it!
Place gutta percha to show you the tract.

This was Periodontal case presentation - be careful! Prepare everything

May need endo - no temporary crown. Looks like hit the pulp once
remove the carious lesion

Dr. Oh says #31 not restorable.
- Biologic width

They didn't think like that - spent money on #31.

Did some endo and thought will be 100% successful, it isn't. should not
see any sinus tract
Mr. S. - 28 year old male. Came to us with someone else initiated endo on #2 but couldn't finish. He wanted the endo finished.

Looked at #31 - diagnosis:
Perio: mild.
Clinical: picture taken by a senior, Dr. Oh said they did a good job. #31 has a large amalgam filling on the occlusal.

Student provider decided to crown #31 - Dr. Oh says based on the picture, that may be recommended because filling is extensive and large area. But GP director also recommended endo to hold the core. Dr. Oh doesn't know why the patient will need a new core.

Was RCT successful by a dental student?
No - it ended up with patient losing #31.

Dr. Oh doesn't like over treatment. Nor under treatment.
- Need correct diagnosis and prognosis and recommend the most appropriate treatment

If patient doesn't have any symptoms, should not recommend over treatment

Same with final exam - pick key words and don't write too much.