Have you ever wondered why a patient who faithfully wears a night guard still finds their teeth wearing and their restorations chipping? Why do some people have wear on both their anterior and posterior teeth and other people just exhibit wear on their anterior teeth and the posterior teeth remain unchanged? Why some areas of wear flat and other areas involve cupping of the dentin? This course will address these questions and more. By discussing the four functional diagnoses which every dentist should be familiar and the different treatment approaches that are required in order to assure long term success dentists will become better equipped to incorporate occlusion into their diagnosis and treatment protocols.

1. Understand the various functional diagnoses and how they relate to risk and prognosis
2. Learn treatment approaches that manage or reduce functional risk and improve long term prognosis
3. Recognize the variety of factors that contribute to tooth wear

**Functional Concerns**

- Pathologic loss of tooth structure
- Mobility
- TMD
- Failing restorations due to functional forces
  - Cement fatigue
  - Fractured restorations

**Attrition**

**REFERENCE:**
Variation in Tooth Wear in Young Adults Over a Two-Year Period
Pintado MR, Anderson GC, DeLong R, Douglas WH.
J Prosthet Dent 1997; 77:313-320

**CONCLUSION:**
- The mean loss for all teeth was 10.7µm by depth for the first year.
- These numbers doubled at 2 years of cumulative wear.
REFERENCE:
Quantitative Evaluation of the Wear Resistance of Posterior Dental Restorations: A New Three Dimensional Measuring Technique
Lambrechts P, Vanherle G, Vuylsteke M, Davidson DL.

CONCLUSION:
• Normal vertical loss of dentinal hard tissue estimated to be about 65 µm per year.

Mechanical wear from mastication
• Variables
  – Chewing pattern
  – Diet
  – Bite force capabilities
  – Dentition
  – Frequency
  – Opposing surfaces
  – Eating Disorders
  – Gastroesophageal reflux (GERD)
  – Environmental factors
  – Industrial factors

REFERENCE:
Limits of Human Bite Strength
Gibbs CH, Mahan PE, Mauderli A, Lundeen HC, Walsh EK.
J Prosthet Dent 1986; 56:226-229

CONCLUSION:
• Bite strength of bruxers can be 6x that of non-bruxers
• Natural teeth range 55-280 lbs

Key Points
• Tooth wear is an almost universal condition
• Erosion seems to be an important factor in tooth wear.
• Most attrition does not require treatment but on occasion restoration is needed to preserve longevity of the teeth.
Functional Diagnosis

Acceptable Function

Constricted Chewing Envelope

Dysfunction

Parafunction / Neurologic Disorders

Acceptable Function

- Efficient use of muscles
- Envelope of function that does not prematurely load teeth
- Maximum intercuspation the brain can find
- Maximum intercuspation that is precise, bilaterally simultaneous and equal in intensity
- All movements and terminal closure must be compatible with harmonious function of the TMJs

Constricted Chewing Pattern

- Anterior tooth position is constricting chewing envelope

Dysfunction

- Posterior tooth/teeth creating avoidance patterns

Parafunction

- Oral activities other than chewing, speaking, swallowing, breathing – i.e. no functional purpose

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Designing Clearance for Functional Pathways

REFERENCE:
The Myth of Anterior Guidance
Bakeman EM, Kois JC
J Cosmetic Dent 2012:28:56-62

Key Points
• Evaluating functional pathways require an approach that more closely mimics outside/in mandibular movements
• Outside/in movements require muscle activation and increased load

Conclusions
• Proper lingual contours can be predictably designed by simulating functional postures and movements.
• Limiting our thinking to confirmation of anterior guidance does not guarantee functional success.
• Inside/out movements are not representative of movements patients engage in on a daily basis when chewing, speaking, swallowing, and breathing.
• Designing proper clearance for functional pathways can be achieved with proper knowledge and training and will help to ensure predictable, long-term restorative outcomes.

“The static way teeth fit together is important. The functional relationship is more important. However, what an individual does with their teeth is the most important.”
~John C. Kois, DMD, MSD

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