

# Cast-Radiograph Evaluation



*The highest commitment to excellence.*

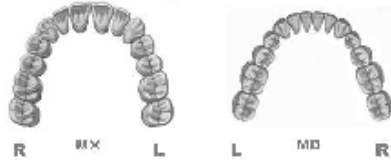
4-12-2010 for print use only.  
 For electronic submission requirement –  
 use ABO Case Report Work File (pdf).

**ABO Cast-Radiograph Evaluation**

Case #  Patient

Total C-R Eval Score:

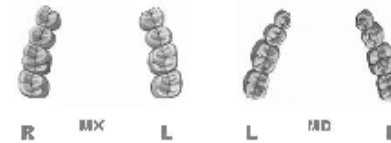
**Alignment/Rotations**



**Marginal Ridges**



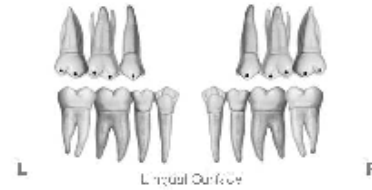
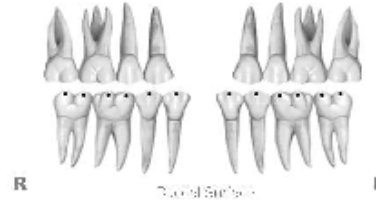
**Buccolingual Inclination**



**Overjet**



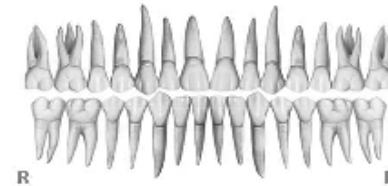
**Occlusal Contacts**



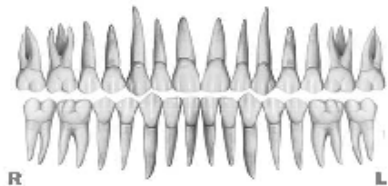
**Occlusal Relationships**



**Interproximal Contacts**



**Root Angulation**



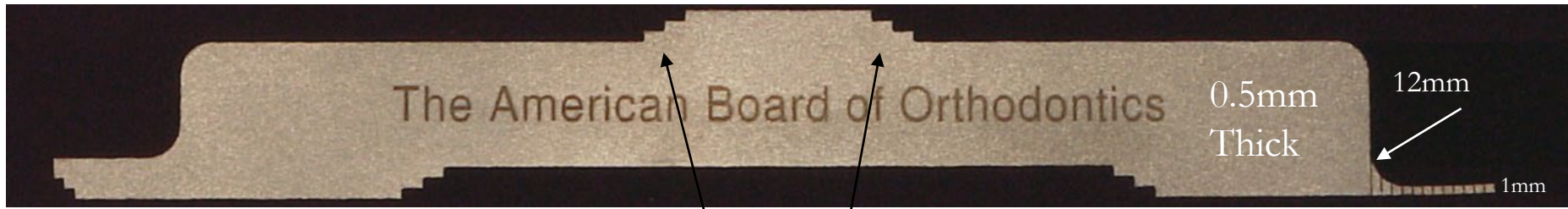
**INSTRUCTIONS:** Place score beside each deficient tooth and enter total score for each parameter in the white box. Mark extracted teeth with "X". Second molars should be in occlusion.

# Resources:

- AmericanBoardOrtho.com – CR-Eval video by Dr. Allen Moffitt
- Purchase ABO gauge on website (1<sup>st</sup> year residents get one free)
- Purchase the CR-Eval calibration kit including test cases on the ABO website
- ABO Advocates
- Questions can be directed to the ABO office or your ABO Director.

# CR-Eval CRITERIA

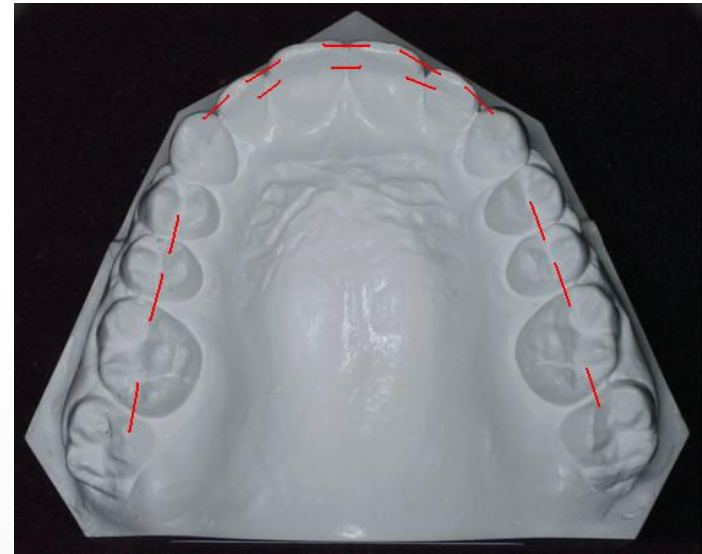
- Alignment
- Marginal ridges
- Buccolingual inclination
- Overjet
- Occlusal contacts
- Occlusal Relationships
- Interproximal contacts
- Root angulation



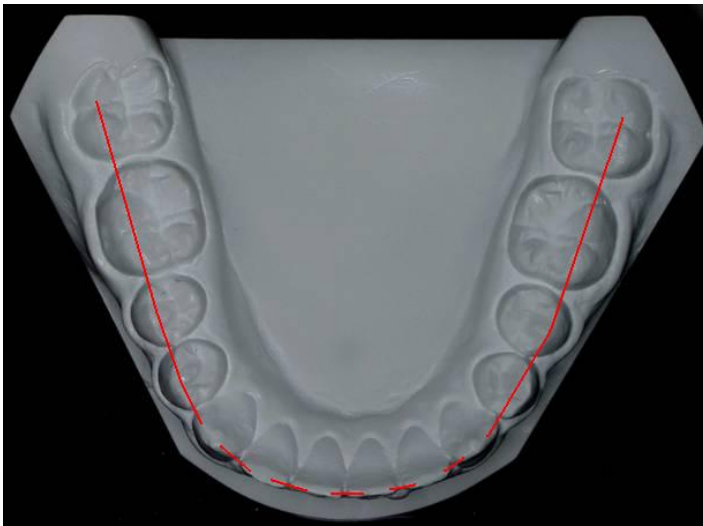
**1 mm increments**

# Alignment – Maxillary Arch

- Anterior teeth -  
Incisal edges and  
lingual surfaces
- Premolars and  
molars - Mesiodistal  
central groove



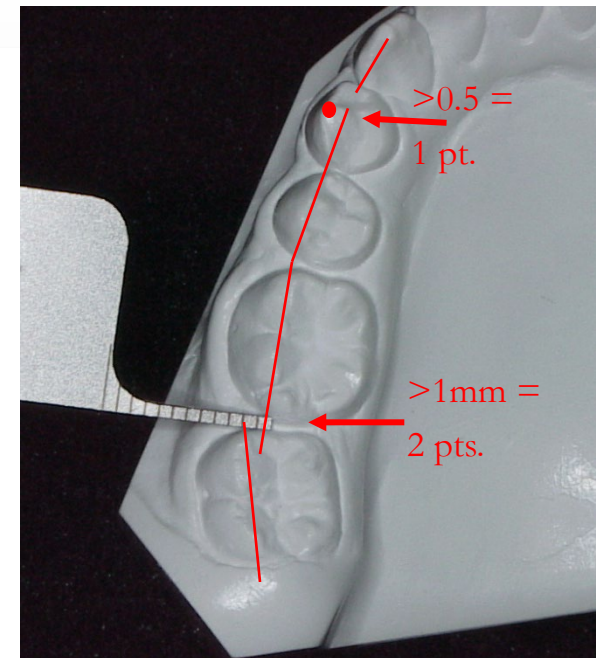
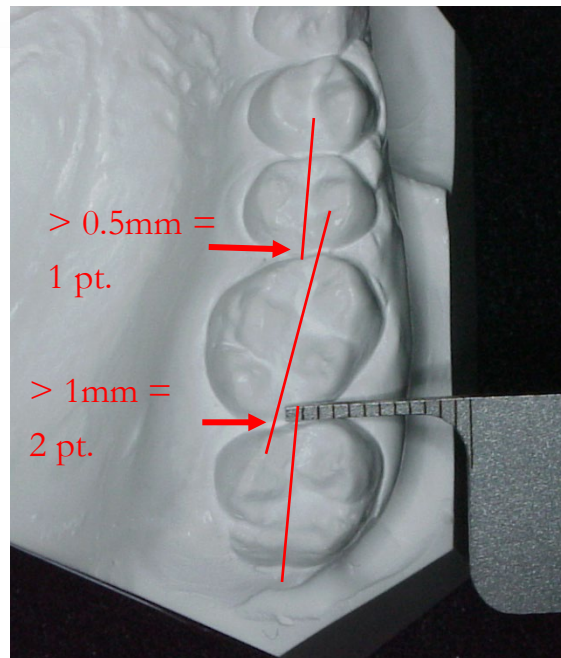
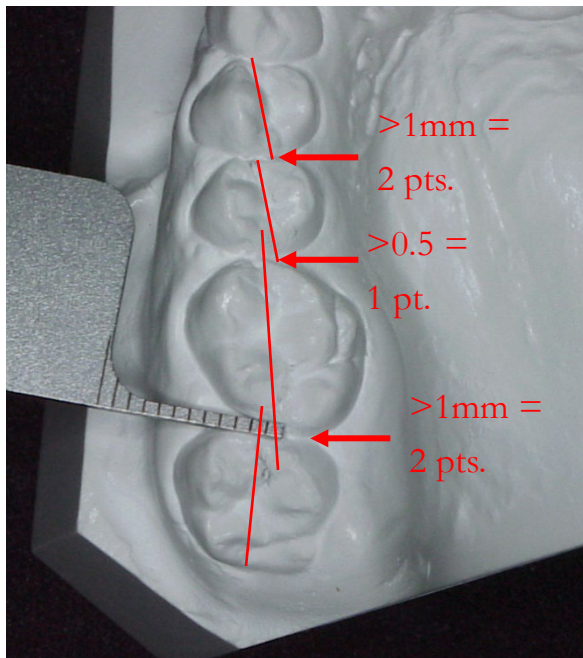
# Alignment – Mandibular Arch



- Anterior teeth -  
Incisal edges and  
labial-incisal surfaces
- Posterior teeth -  
Buccal cusps

# Alignment Deductions

- 0.5mm to 1mm = 1 point
- >1mm = 2 points (Never more than 2 points)
- 80% of alignment errors occur in the maxillary and mandibular lateral incisors and second molars.





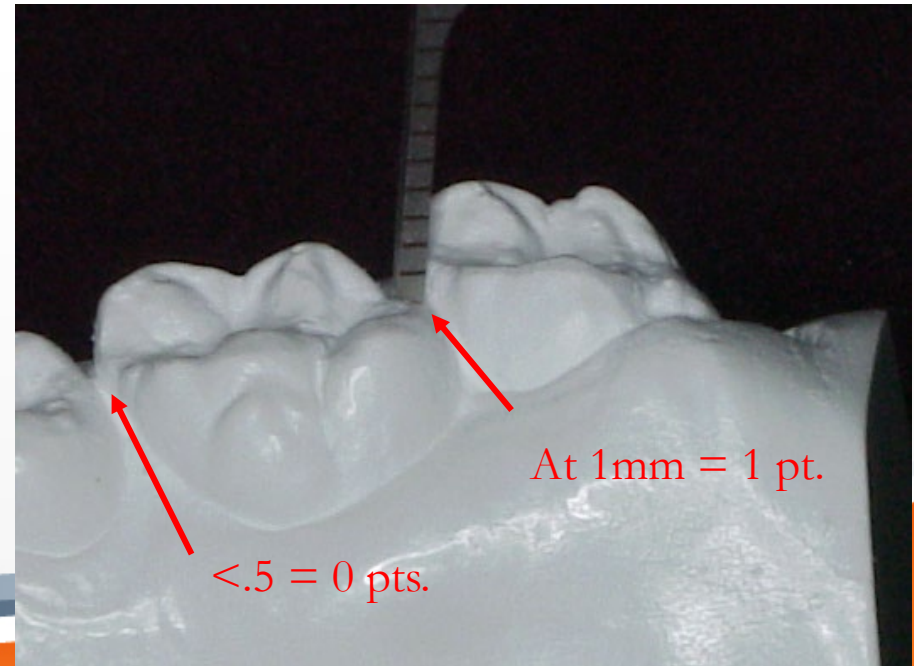
# Marginal Ridges

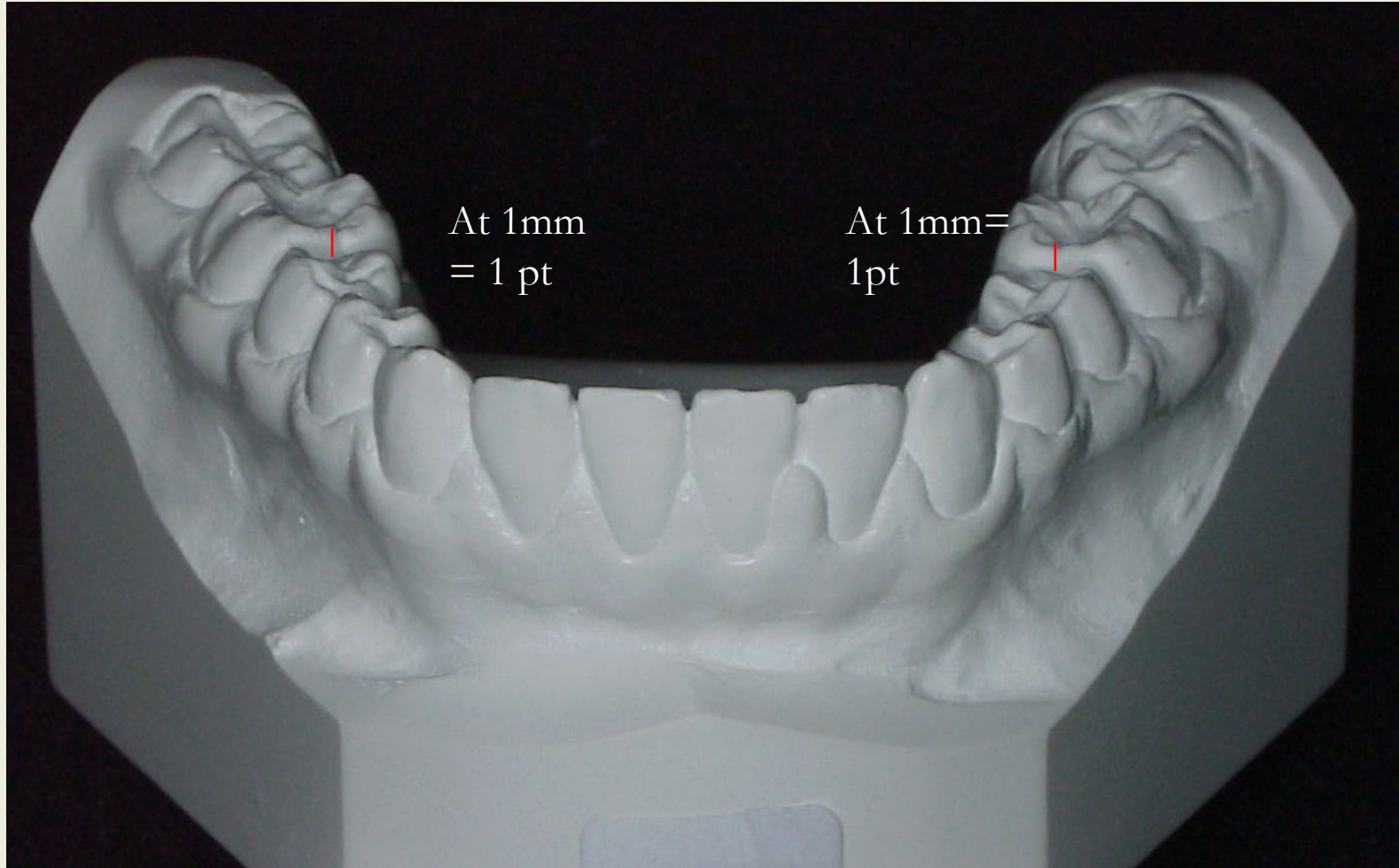
## Goals:

- The marginal ridges of adjacent posterior teeth should be at the same level or within 0.5 mm.
- Level marginal ridges provide for flat interproximal bone and a more ideal occlusion.
- DON'T score distal of lower 1<sup>st</sup> Premolars

## Deductions:

- 0.5mm to 1mm = 1 point
- >1mm = 2 points
- Most common errors - first and second molars –U&L





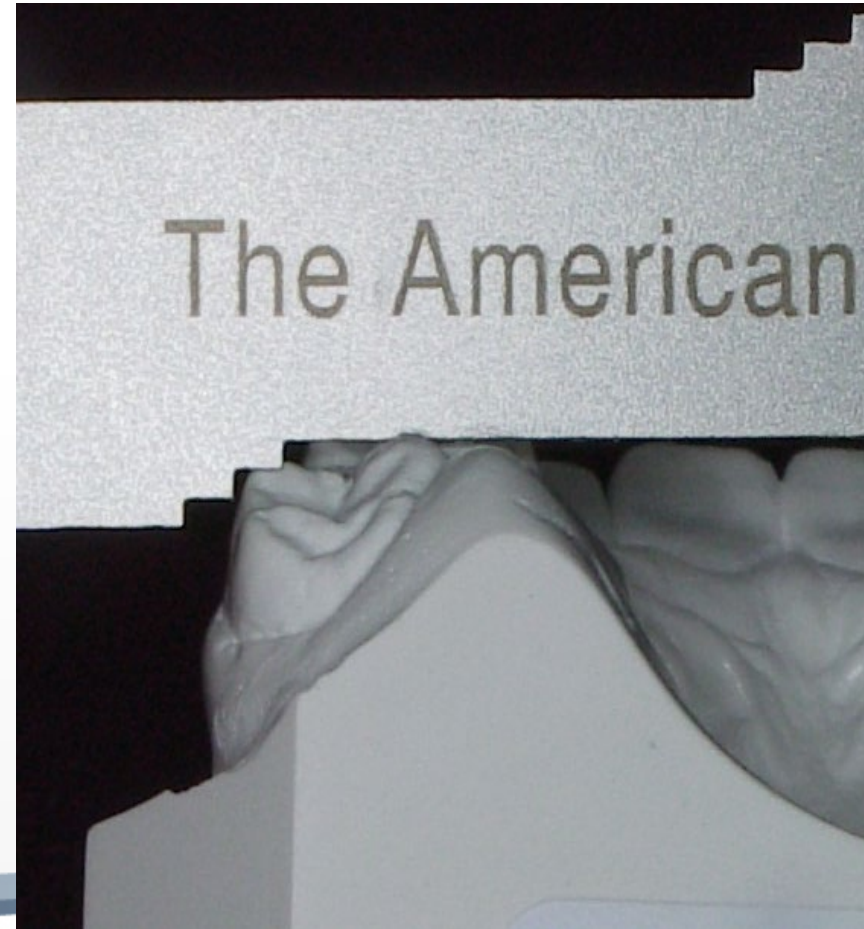
At 1mm  
= 1 pt

At 1mm=  
1pt

# Buccolingual Inclination

Goals – Posterior teeth only

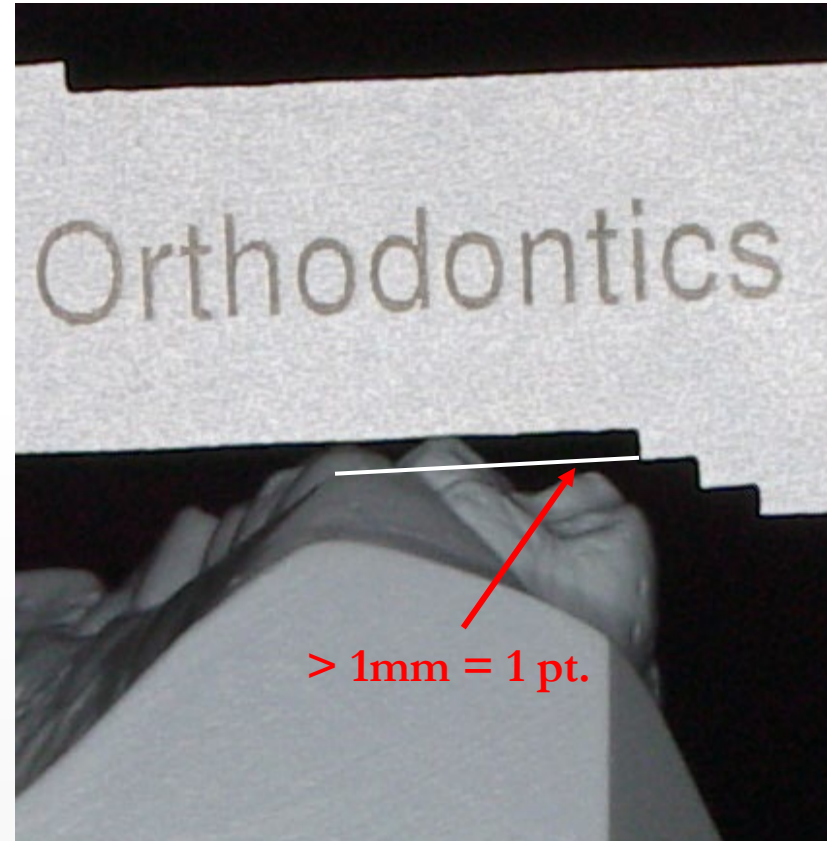
- Maxillary arch - the straight edge should contact the lingual cusps with the buccal cusps positioned *within* 1 mm of the edge.
- Mandibular arch - the straight edge should contact the buccal cusps with the lingual cusps positioned *within* 1mm of the edge.



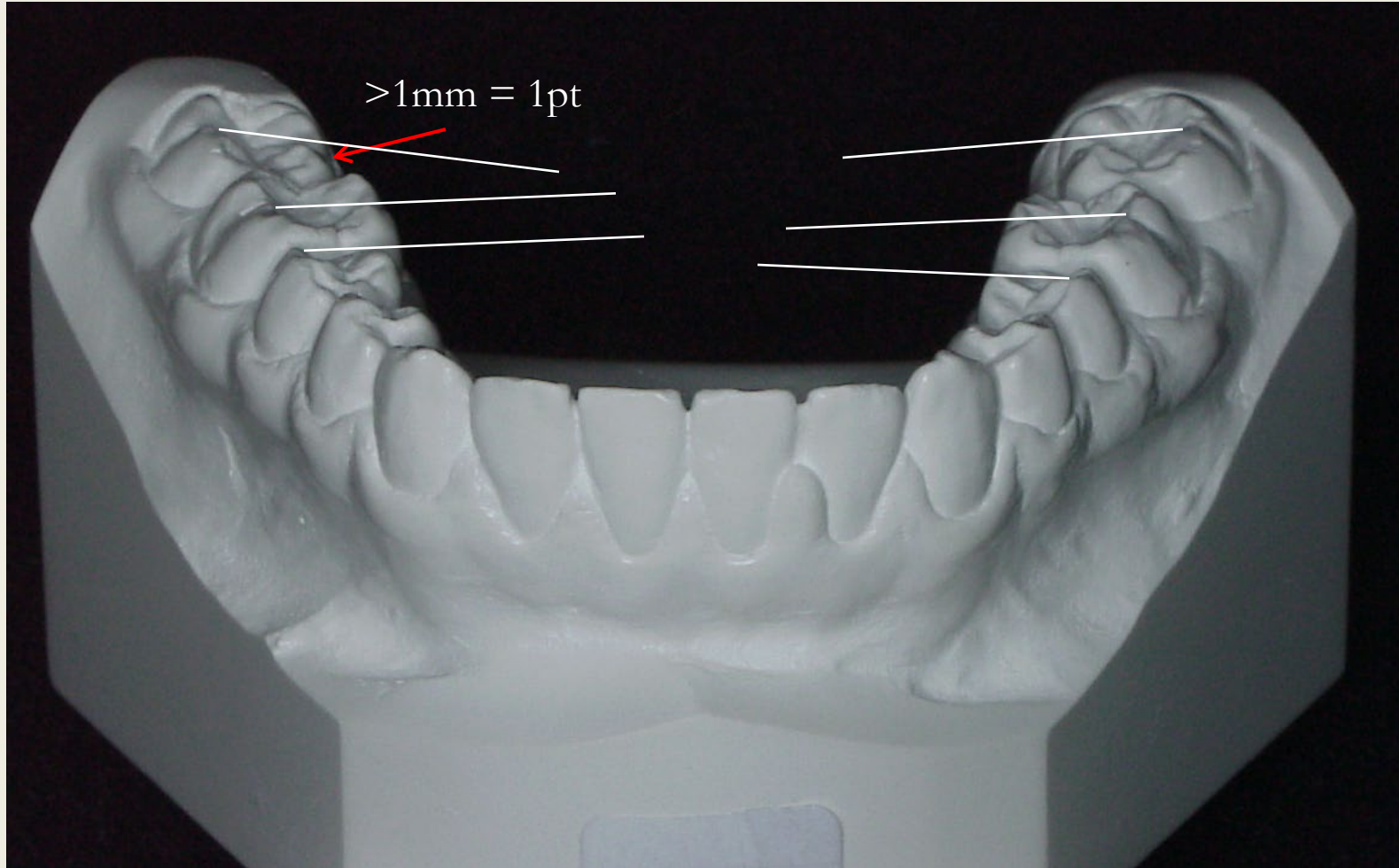
# Buccolingual Inclination

## Deductions:

- $>1\text{mm}$  but  $<2\text{mm}$  = 1 point
- 2mm or more = 2 pts
- The most common problems occur with the Mx and Mx 2nd molars.
- DON'T score L 1<sup>st</sup> Premolars
- **DON'T score distal cusps of U&L second molars**







>1mm = 1pt

# Overjet

- Is measured with the models laying flat on their back or mounted on an articulator.

## Goals:

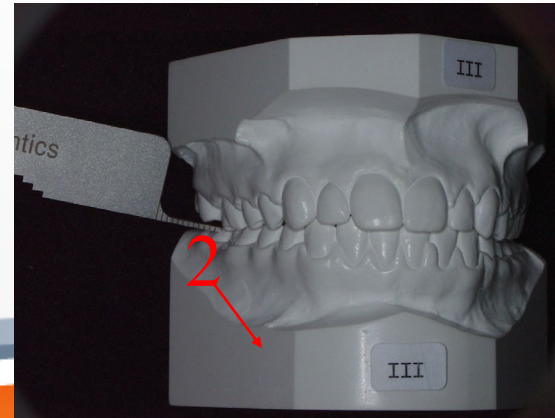
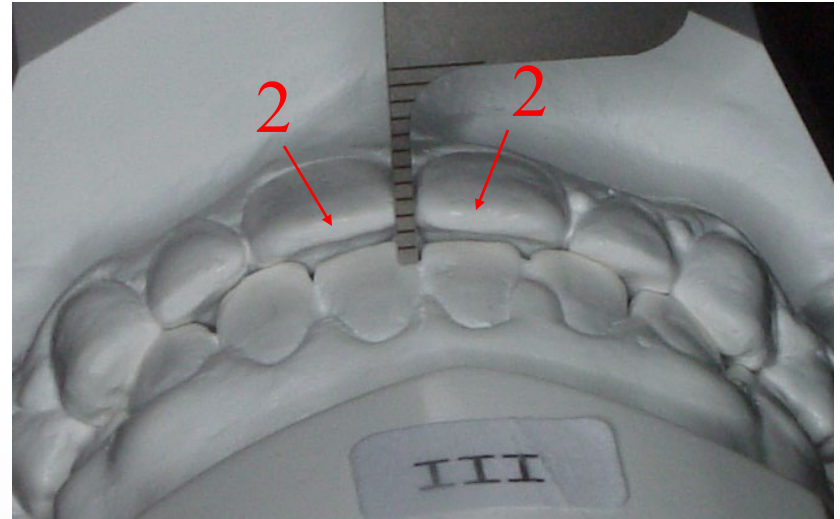
- Lingual cusps of maxillary posterior teeth and buccal cusps of mandibular posterior should contact opposing occlusal surface, centered buccolingually.
- In the anterior region, the mandibular canines and incisors will contact the lingual surfaces of the maxillary canines and incisors.



# Overjet

## Deductions:

- Out of contact to 1mm = 1 pt
- >1mm = 2 pts
- Majority of errors are 2<sup>nd</sup> molars and incisors

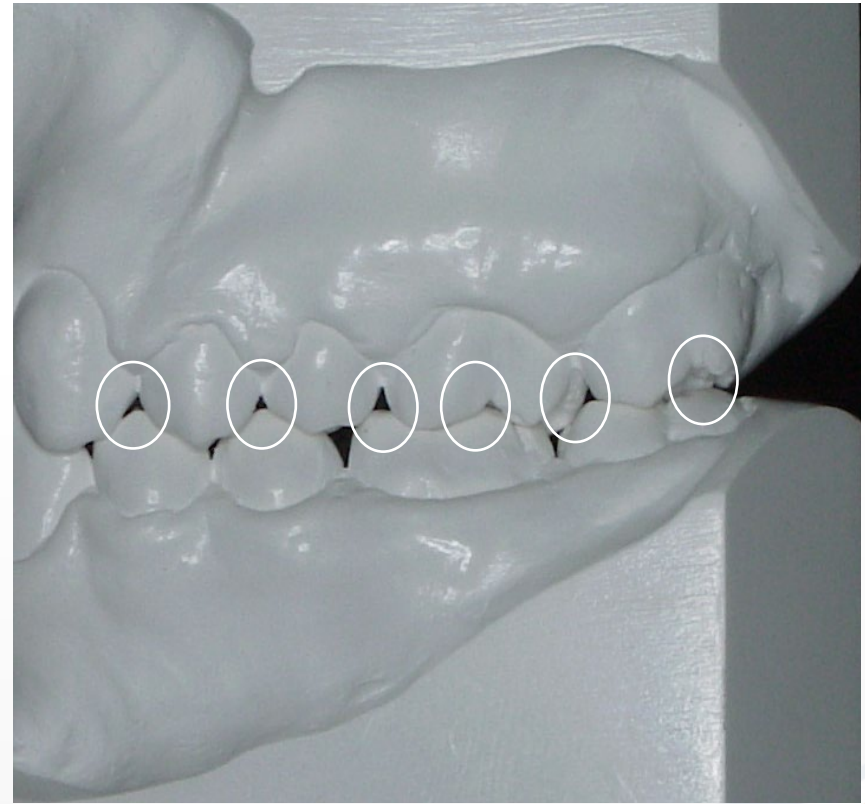




# Occlusal Contacts

## Goals

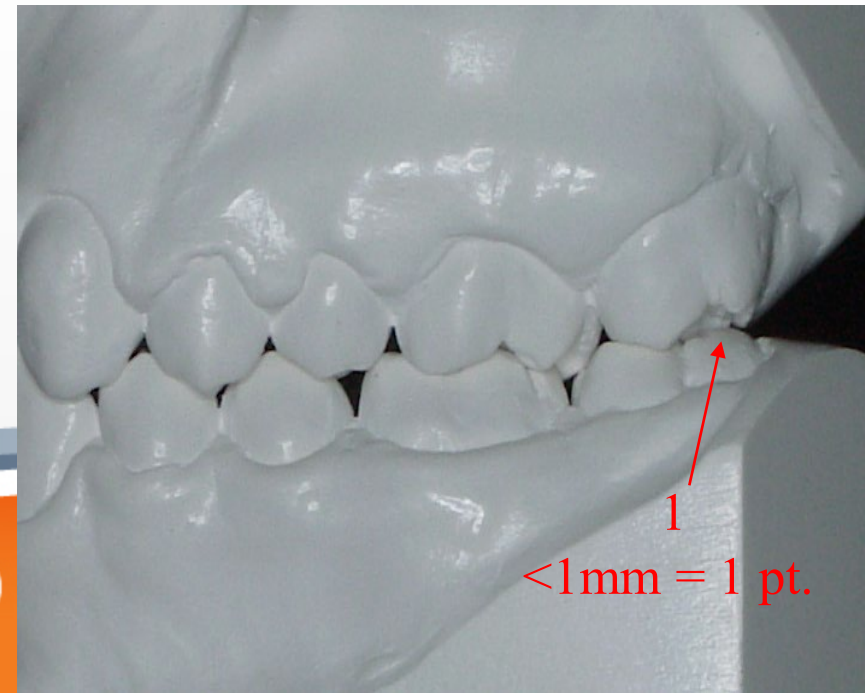
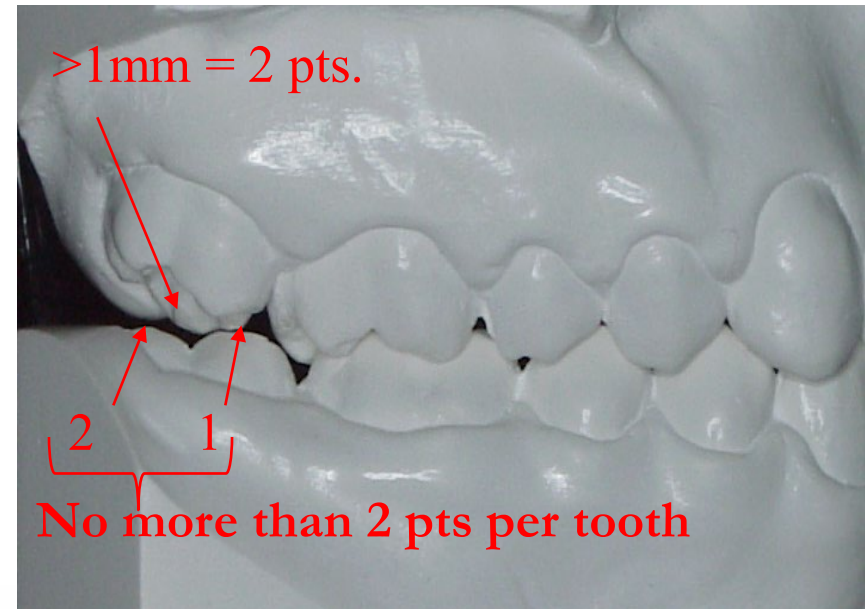
- Buccal cusps of the mand. premolars and molars and the lingual cuspid of the max. premolars and molars should be contacting the occlusal surfaces of the opposing teeth.
- Each mand. molar has two cusps. Max. molars may have one or two functioning lingual cusps.



# Occlusal Contact

## Deductions:

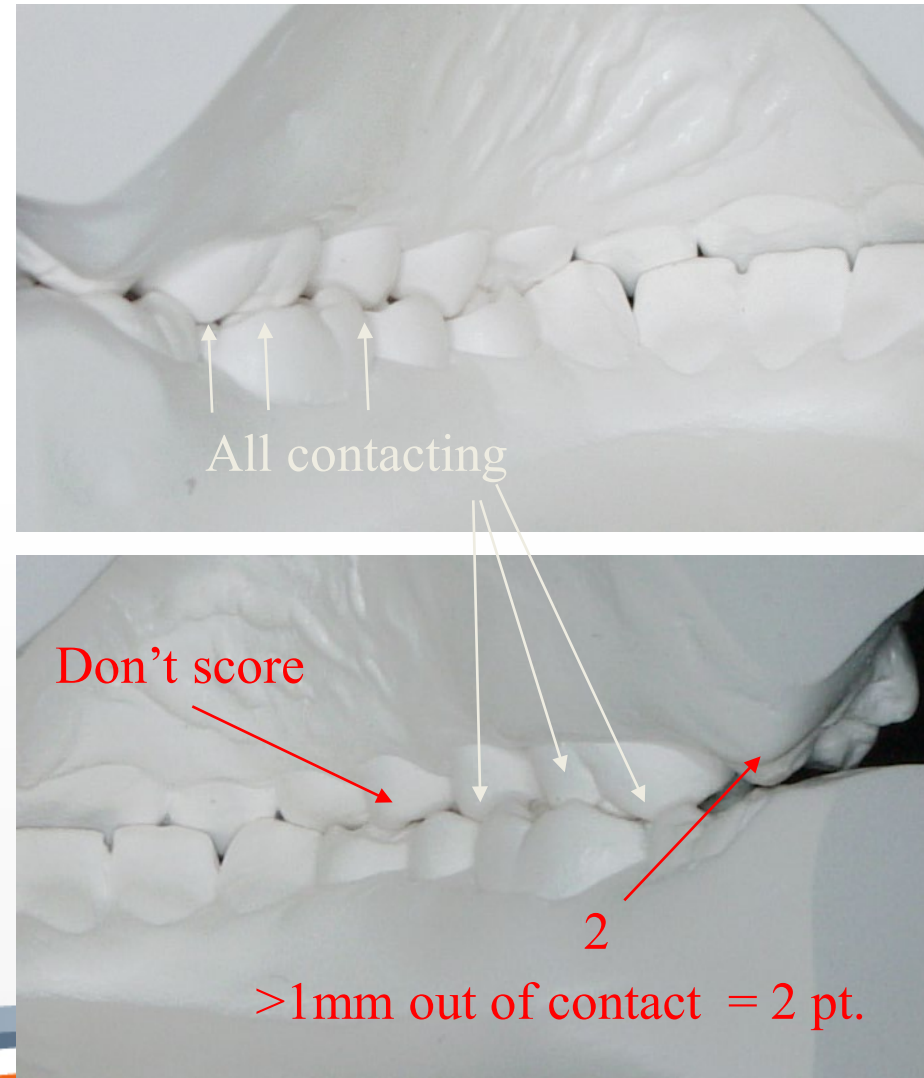
- 1 pt. deducted for each tooth out of contact a distance of 1 mm or less.
- Out of contact  $> 1 \text{ mm} = 2 \text{ pts.}$



# Occlusal Contact

## Scoring:

- Don't score lingual cusps U4s
- Score DL cusps U6s unless small
- The most common errors are with the second molars.



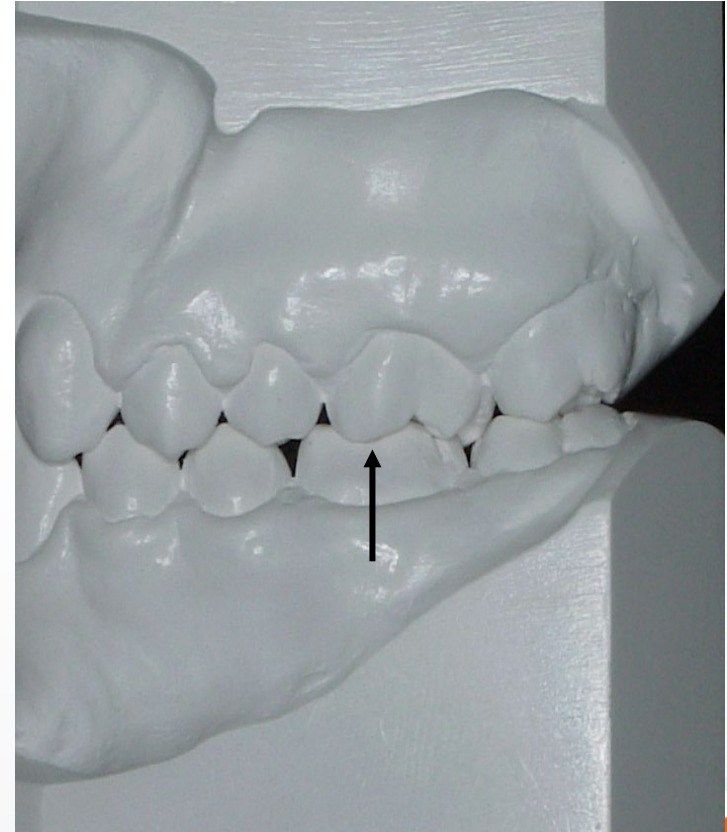
# Occlusal Relationship

## Goals:

- Depends on whether finishing Class I, II or III
- The buccal cusps of the maxillary posterior teeth, including the cuspids, should align within 1 mm of the interproximal embrasures of the mandibular posterior teeth.

## Class I Goal:

- The mesiobuccal cusp of the maxillary first molar must align within 1 mm of the buccal groove of the mandibular first molar.



# Occlusal Relationship Goals

## Class II Finish:

- “The buccal cusp of the maxillary first molar should align with the embrasure or interproximal contact between the mandibular second premolar and first molar.”
- “The buccal cusp of the maxillary second molar should align with the embrasure or interproximal contact between the mandibular first and second molars.”

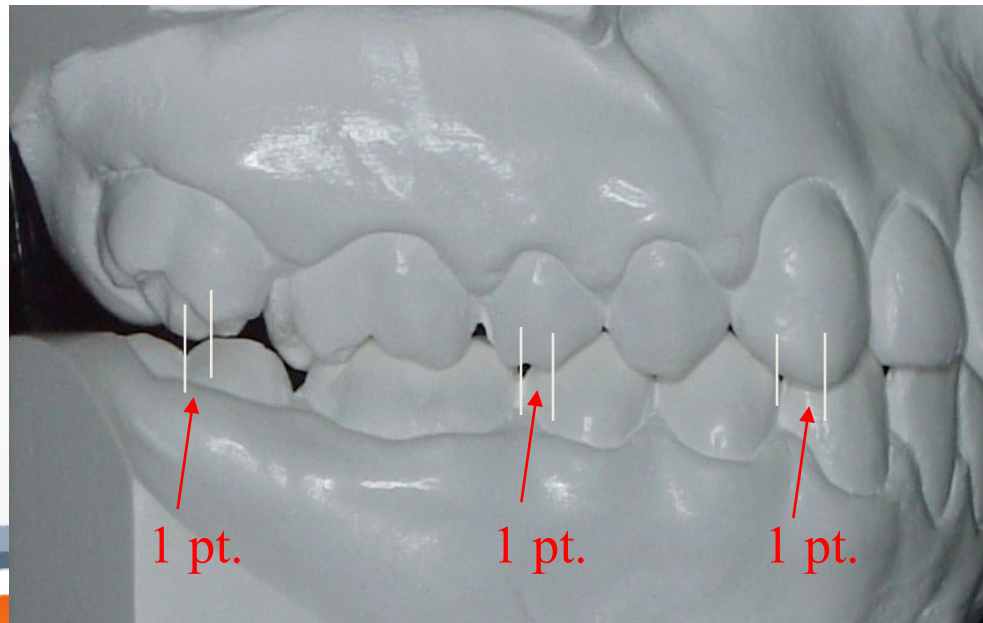
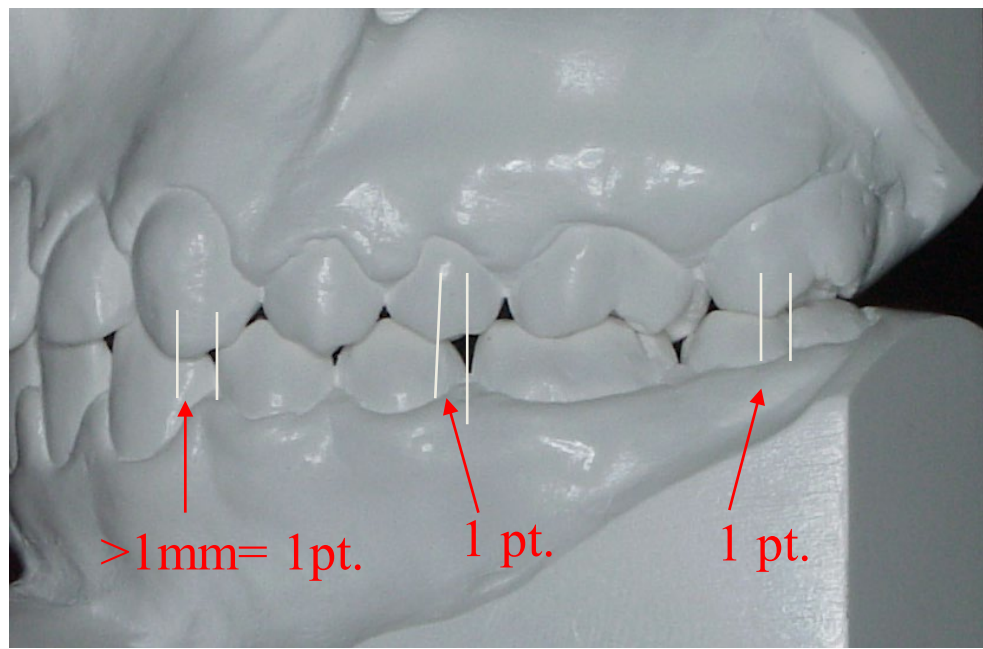
## Class III Finish:

- “The buccal cusp of the maxillary second premolar should align with the buccal groove of the mandibular first molar.”
- “The remaining occlusion distal to the maxillary second premolar and mandibular first molar are adjusted accordingly.”

# Occlusal Relationship

## Deductions:

- $>1\text{mm}$  but  $< 2 = 1$  pt
- $2\text{mm}$  or more = 2 pts
  
- Deductions in this category can be significant because they often involve the entire segment!



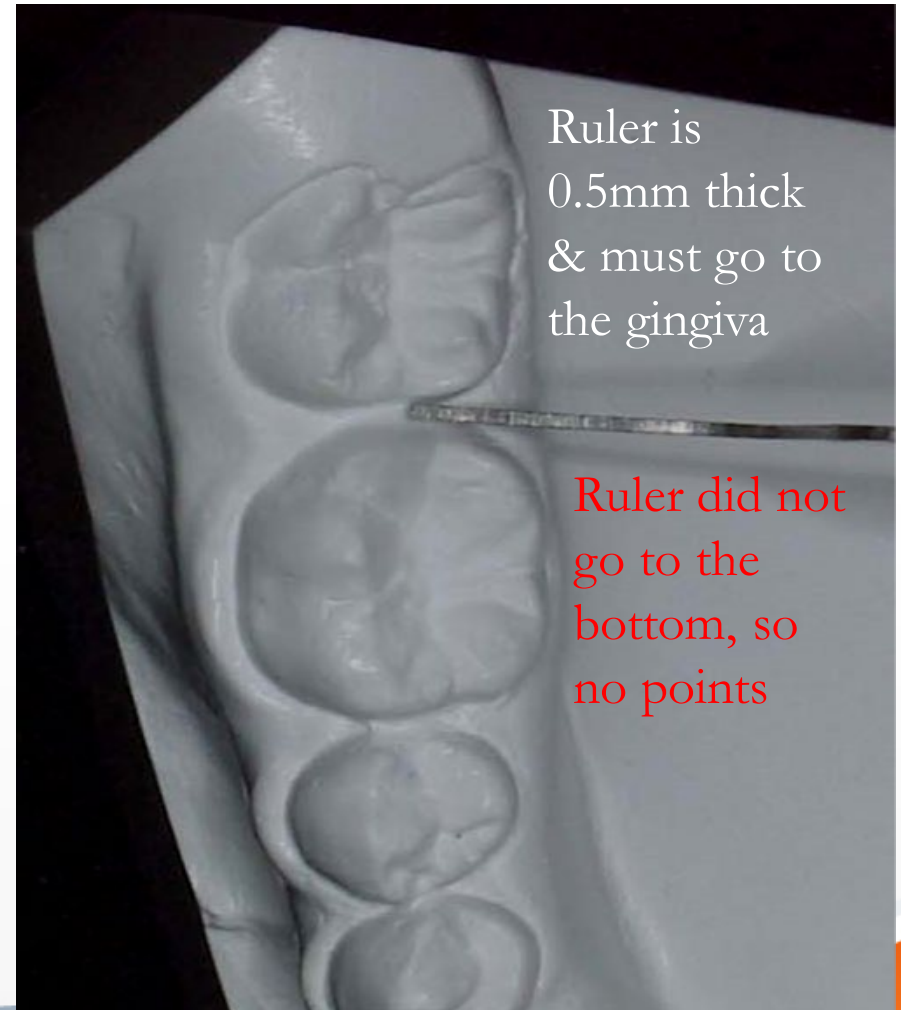
# Interproximal Contacts

## Goal:

- Mesial and distal surfaces should contact each other.

## Deductions:

- The ABO measuring instrument is 0.5mm thick
- $>0.5\text{mm}$  to 1 = 1 point
- $>1\text{mm}$  = 2 pts.



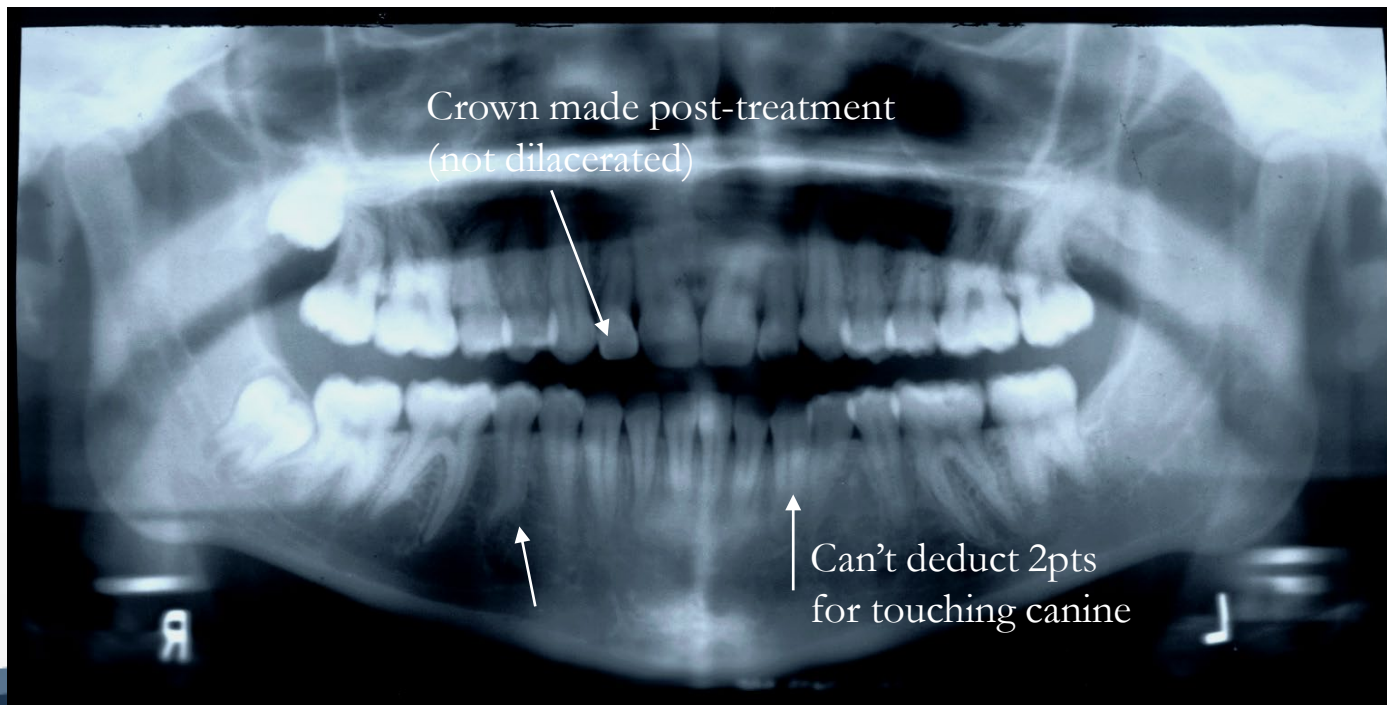
# Root Angulation

Goal:

- Roots should be parallel on the panoramic radiograph

Exceptions:

- Dilacerated roots are NOT scored
- Do not score canine position with adjacent teeth

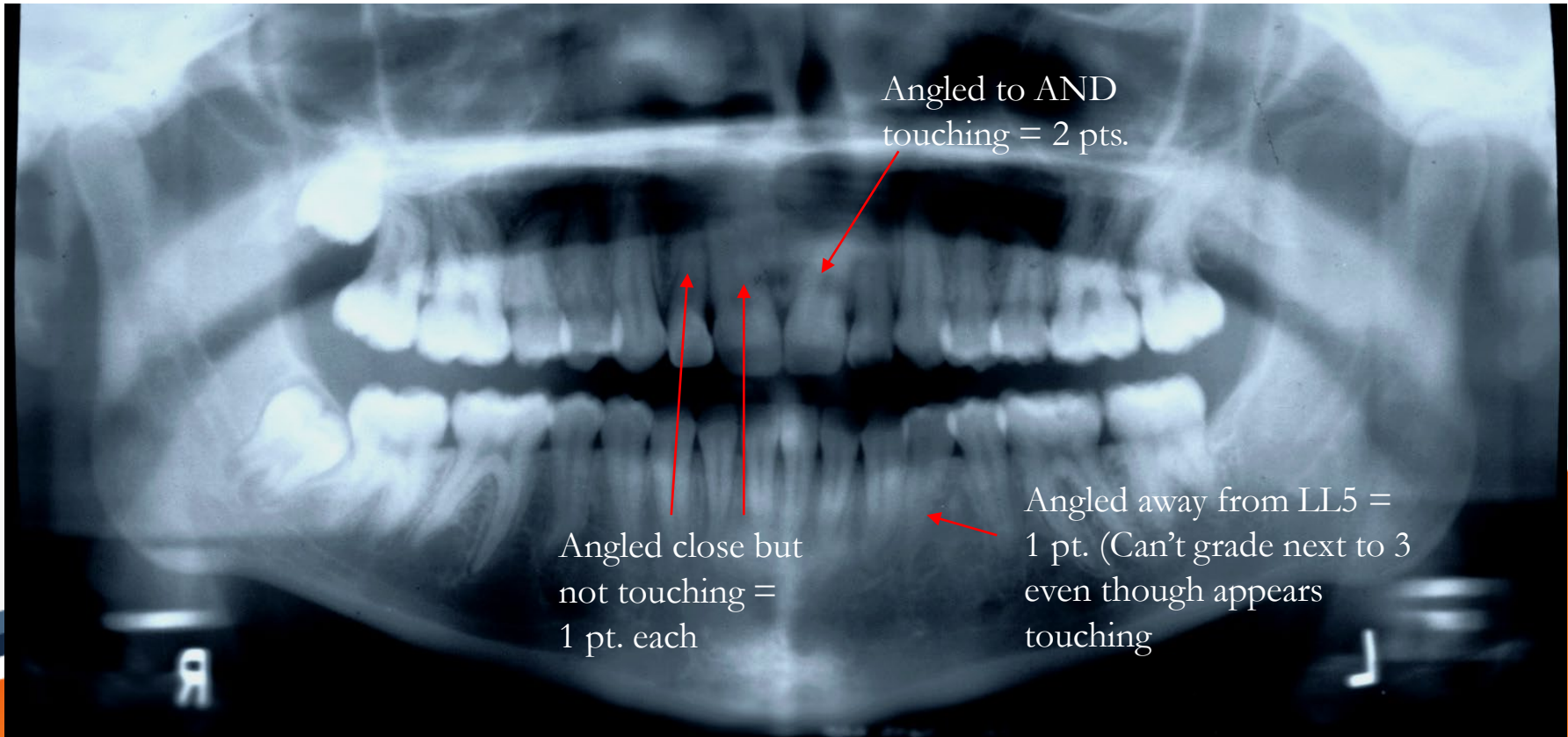




# Root Angulation

## Deductions:

- Not parallel, angled close to adjacent tooth but not touching = 1 pt
- Roots touching = 2 pts



# Overall Cast-Radiograph Eval

## Summary:

- Deductions of 27 points or more would have likely cause a case to be incomplete in past ABO Clinical Exams.

**Calibration Kit Scoring Key**

**ABO Cast-Radiograph Evaluation**

**Case #** III

**Total C-R Eval Score:** 40

**Alignment/Rotations**  
12

**Marginal Ridges**  
3

**Buccolingual Inclination**  
3

**Overjet**  
6

**Occlusal Contacts**  
5

**Occlusal Relationships**  
6

**Interproximal Contacts**  
0

**Root Angulation**  
5

**INSTRUCTIONS:** Place score beside each deficient tooth and enter total score for each parameter in the white box. Place an "X" on extracted teeth. Second molars should be in occlusion.

# RECOMMENDATIONS:

- Band / Bond 2<sup>nd</sup> Molars!!
- Take a progress panx after 9 –12 months to evaluate root position AND reposition brackets or bands!
- Take progress models for evaluation and grading
- Make a habit of checking 2<sup>nd</sup> molars: Torque and overjet
- If 2<sup>nd</sup> molars are not in occlusion, then take another set of final records after they have settled, BUT within 12 months

# RECOMMENDATIONS:

- Give yourself plenty of time to FINISH
- Slide around to the other side of the chair to check A-P correction
- Equilibrate at or close to debanding
- BE CRITICAL when grading yourself!