2010 ADEA Annual Conference

Grading Rubrics
Critical thinking is foundational to teaching and deep learning.
In professional practice, critical thinking enables the dentist to:

- Recognize pertinent information,
- Make appropriate decisions based on a review of the available options,
- Evaluate outcomes of diagnostic and therapeutic decisions,
- Assess his or her own performance.
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Assessing Critical thinking in Fixed Prosthodontics
Scenario based short essay exam

- Requires **application** of foundation knowledge.
- Requires **integration** of information across specialty boundaries.
- Reveals **Student’s thought process**.
Scenario based short essay exam

- Requires application of foundation knowledge.
- Requires integration of information across specialty boundaries.
- Reveals the student’s thought process.

Clinical situations ...
... without “textbook” answers

- Grading complex and time intensive.
- Grading consistency and objectivity tough
Open book, open notes, open computer.

- Well received as a collaborative effort, but still individually graded.
- Most effective as an individual effort.
PROS 7018 Mid Term Scores

Score Ranges

- 40-44
- 45-49
- 50-54
- 55-59
- 60-64
- 65-69
- 70-74
- 75-79
- 80-84
- 85-89
- 90-94
- 95-99
- 100-104
- 105-110

Collaborative

Frequency

PROS 7018 Final Exam Scores

Score Ranges

- 40-44
- 45-49
- 50-54
- 55-59
- 60-64
- 65-69
- 70-74
- 75-79
- 80-84
- 85-89
- 90-94
- 95-99
- 100-104
- 105-110

Individual

Frequency
Open book, open notes, open computer.

- Effective as a community experience, but individually graded.
- Most effective as an individual effort.

Questions provided weeks before the exam ... but not the scenarios.

- For group effort, scenarios are released days before the exam.
- For individual effort, images are released at exam time.

No messaging!
How do rubrics help?

- Objectify grading
- Grading transparency
- Reduce grading time

Creating the rubric

- Starts with the question:
  - Unambiguous
  - Enough information provided
  - Make it real
How do rubrics help?

- Objectify grading
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- Reduce grading time

Creating the rubric

- Starts with the question:
  = Unambiguous
  = Enough information provided
  = Make it real
Example Question:

Review the two images of Patient #1.

CC: Mild pain area #18 with chewing

52 year old male. Pulp #18 responds vital to cold without lingering pain. Pain reproduced with isolated load on MF & ML cusps #18. No pocketing greater than 3 mm #18. No apparent caries. Moderate occlusal load potential.

- How would you restore #18?
- Justify your restoration choice.
What you are given:
- Mild pain with chewing.
- Vital pulp.
- No periodontal pocketing.

What you can see:
- Relatively wide occlusal isthmus.
- Vertical cracks on the facial.
- Crack in the pulpal floor.
- Adjacent cast gold restoration

What you should infer:
- Incomplete tooth fracture in dentin.
- Compromised cuspal strength to resist splitting.
- Metal coverage esthetically acceptable to patient.
Anticipated answers:

- Full cuspal coverage restoration.
  - MODFL gold onlay
  - Partial veneer crown
  - Interim crown with reeval of symptoms before definitive restoration
  - Bonded amalgam build-up with full metal crown
  - Complex amalgam w/ cuspal coverage
  (in that order for conservation of tooth)

- Justified on basis of:
  - Prevention of crack propagation by cuspal cover.
  - Ferrule effect created by casting.
  - Metal crown to minimize tooth reduction.
Less acceptable options:
- PFM or all ceramic crowns due to extent of tooth reduction required.

Unacceptable Options:
- Any option that does not include full cuspal coverage, including:
  = Simple amalgam or composite restoration
  = Cast or milled inlay.
- Composite cuspal coverage due to wear.

Comments:
RCT is not appropriate.
“Reversible pulpitis 2° to incomplete tooth fracture”
It is restored to prevent crack propagation.
Treat the cause, not the symptom.
Creating the rubric

- Assign a maximum point value for each possible answer when it has been adequately justified.
- Keep the maximum point value clinically grounded.

You can’t rationalize a poor choice to clinical acceptability.
Restoration Choice:

- Onlay, partial veneer crown (+5)
- Interim crown with reEval (+5)
- Build-up with gold crown (+4)
- Cuspal coverage complex amalgam (+3)
- Build-up with metal Occlusal PFM (+3)
- Build-up with porcelain Occlusal PFM (+2)
- All ceramic crown (+1)
- Cuspal coverage composite (+0)
- All non-cuspal coverage options (+0)
Creating the rubric

- Assign a maximum point value for each possible answer when adequately justified.
- Keep the maximum point value clinically grounded.
- Assign points for justification elements in proportion to importance and to fulfill the maximum point value.
Diagnosis related rationale: 10 poss. pts

- Cracked tooth diagnosis / propagation risk (+5)
- Ferrule effect of cuspal coverage (+5)

Restoration specific rationale:

Onlay, partial veneer crown: 6 possible points

- Tooth conservation (+3)
- Esthetics non-issue due to metal crown 19 (+2)
- Cost / Longevity (+1)
Interim crown with ReEval  6 possible points
- Predictability (+5)
- Expediency (+1)

Build-up with gold crown  6 possible points
- Tooth conservation (+2)
- Strength / longevity (+1)
- Esthetics non-issue (+2)
- Expediency (+1)

Complex amalgam  5 possible points
- Tooth conservation (+1)
- Esthetics non-issue (+2)
- Expediency (+1)  - Cost / longevity (+1)
Build-up / metal occlusal PFM  
- Strength / longevity (+2)
- Esthetics (+1)

Build-up / porcelain occ PFM  
- Esthetics (+1)
- Strength / longevity (+1)

All ceramic crown  
- Esthetics (+1)

Cuspal coverage composite  
Non-cuspal coverage options
<table>
<thead>
<tr>
<th>Restoration Diagnosis Rationale</th>
<th>Onlay, Partial Veneer</th>
<th>Interim with ReEval</th>
<th>Build-up, metal crown</th>
<th>Complex Am</th>
<th>Build-up, Metal Occ PFM</th>
<th>Build-up, Porc Occ PFM</th>
<th>All Ceramic Crown</th>
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</thead>
<tbody>
<tr>
<td><strong>Restoration Choice</strong></td>
<td>+ 5</td>
<td>+ 5</td>
<td>+ 4</td>
<td>+ 3</td>
<td>+ 3</td>
<td>+ 2</td>
<td>+ 1</td>
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<tr>
<td><strong>Incomplete tooth fracture</strong></td>
<td>+ 5</td>
<td>+ 5</td>
<td>+ 5</td>
<td>+ 5</td>
<td>+ 5</td>
<td>+ 5</td>
<td>+ 5</td>
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<tr>
<td><strong>Ferrule effect</strong></td>
<td>+ 5</td>
<td>+ 5</td>
<td>+ 5</td>
<td>+ 5</td>
<td>+ 5</td>
<td>+ 5</td>
<td>+ 5</td>
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<tr>
<td><strong>Tooth conservation</strong></td>
<td>+ 3</td>
<td>+ 2</td>
<td>+ 1</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Esthetics non-issue</strong></td>
<td>+ 2</td>
<td>+ 2</td>
<td>+ 2</td>
<td></td>
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<tr>
<td><strong>Cost vs. Longevity</strong></td>
<td>+ 1</td>
<td></td>
<td>+ 1</td>
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<td></td>
<td>+ 1</td>
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<tr>
<td><strong>Predictability</strong></td>
<td></td>
<td>+ 5</td>
<td></td>
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<tr>
<td><strong>Expediency</strong></td>
<td>+ 1</td>
<td>+ 1</td>
<td>+ 1</td>
<td>+ 1</td>
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<tr>
<td><strong>Strength vs. Longevity</strong></td>
<td></td>
<td></td>
<td>+ 1</td>
<td></td>
<td>+ 2</td>
<td>+ 1</td>
<td></td>
</tr>
<tr>
<td><strong>Esthetics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+ 1</td>
</tr>
</tbody>
</table>
Helpful hints

- Maintain student anonymity … make a big deal about it.
- Mark 10% of the papers before finalizing the point values of responses … students have good ideas … sometimes ideas you won’t think of.
- Provide your grading rubric to the students with the answer key.
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<table>
<thead>
<tr>
<th></th>
<th>Was a crown indicated?</th>
<th>Did the patient receive “value for the dollar?”</th>
<th>Would you refer to the treating dentist?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
</tr>
<tr>
<td>No</td>
<td>Fail</td>
<td>Fail</td>
<td>Fail</td>
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</tbody>
</table>
Dr. Steve Haney
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