**EBD Curriculum Manuscript Appendices**

**Appendix 1: Critical Thinking Assignment**

D2/D3 Reflection Format:

1. Describe self, peer, patient and/or faculty event (i.e., experiences and/or interactions). **1-2 paragraphs**
   1. Provide sufficient details for the reader to understand exactly what transpired (outcome), who was involved (players/instruments/lab equipment) and what role each individual/inanimate object played (actions, behaviors, communications).
2. Describe your emotional response to the event, and identify what component(s) of the event made you feel this way. **1 paragraph**
3. Identify the problem (if any) posed or resulting from the event. **1 paragraph**
4. Analyze and critique the event – use either ‘a’ or ‘b’ to guide your critique.
   1. If appropriate,
      1. Outline each individual’s
         1. Assumptions.
         2. Biases.
         3. Point of view.
         4. Data/information/evidence base.
      2. If the event does not include other people, then
         1. Identify circumstantial components within the experience that shaped the event.
         2. Identify whether or not such circumstantial components might have been modifiable.
         3. Identify how modifying the components could have changed the event.
      3. Comment on the similarities and/or differences between individuals’ assumptions, biases, points of view and information bases.
      4. Assume the identity of a different individual – do you see the situation differently? Should you have operated from a different assumption, point of view or information base, would that have led to different action, behavior or communication on your part?
      5. Identify a different action, behavior or communication on your part, and describe the implications of that difference for the event outcome.
5. Describe whether or not modification of the components which could lead to a changed event is desirable or not.
6. General rule: Actual names may be used, or names might be replaced by initials, acronyms, numbers or letters (i.e., Dr. Smith, DK, Faculty #1 or ‘A’). Please do not exchange actual names or assign them to other players.

D2 Reflection Prompts: The following suggestions are designed to guide your reflection activities. Each suggestion can be completed once; any order is acceptable.

*Fall Semester (3)*

1. Describe an event you witnessed during the past week that left you unsettled. The event might have been as simple as a rude customer at the grocery store or as complex as a political exchange at the international level.

2. Describe some interaction between you and one or more parties that occurred away from the dental school during the past week that left you irritated, ticked off and/or wanting to get even.

3. Describe an event that you witnessed during the past week that made you smile.

4. Describe something you did away from the dental school during the past week that made you feel good.

5. Free choice – any event which is bothering you is free game to critique and analyze if such analysis will benefit your thinking skills.

*Spring Semester (4)*

6. Describe something that was said or occurred in a lecture during the past week that left you unsettled or ticked off.

7. Describe some interaction between you and one or more parties in clinic during the past week that made you smile.

8. Describe some interaction that included you and a faculty member (with or without a patient or other students) that left you unsettled, irritated, or depressed during the past week.

9. Describe some interaction between you and a patient (with or without a faculty member or other students) that left you unsettled, irritated or depressed during the past week.

10. Describe a clinic patient and/or procedure from the past week.

11. Free choice – any event which is bothering you is free game to critique and analyze if such analysis will benefit your thinking skills.

D3 Reflection Prompts: Students are expected to complete 1 reflection in each of 5 clerkships evenly spaced throughout the year. The following prompts are designed to guide your reflection activities.

1. Describe some interaction that included you and a faculty member (with or without a patient or other students) that left you unsettled, irritated, or depressed during the past week.

2. Describe some interaction between you and a patient (with or without a faculty member or other students) that left you unsettled, irritated or depressed during the past week.

3. Describe a situation in clinic where your ethical and/or professional values were challenged.

4. Describe a clinical situation which required patient management skills.

5. Describe a clinical case where your self-assessment did not correlate with the faculty member’s assessment.

6. Free choice – any event which is bothering you is free game to critique and analyze if such analysis will benefit your thinking skills.

**Appendix 2: D2/D3 Critical Thinking Evaluation Grid**

**REFLECTION EVALUATION CRITERIA**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Component** | **Score\*** | | | | |
|  | 1 | 2 | 3 | 4 | 5 |
| **Event** |  |  |  |  |  |
| Event description |  |  |  |  |  |
| Emotional response |  |  |  |  |  |
| Problem posed |  |  |  |  |  |
| **Analyses** |  |  |  |  |  |
| Player’s assumptions, biases, point of view, information base or components shaping event, potential modification of components, outcome of modifying components if appropriate. |  |  |  |  |  |
| Differences between player’s assumptions, biases, point of view, information base |  |  |  |  |  |
| Ability to view situation from a different perspective |  |  |  |  |  |
| Alternative actions and implications |  |  |  |  |  |
| **Discussion of desirability of modified components on final outcome** |  |  |  |  |  |
| **Summary Score:** |  |  |  |  |  |

\*Score interpretation:

1: Lacks depth, breadth or insight – requires revision to explore one or more components

2: Limited depth, breadth or insight – monitor for growth, may request revision for exploration of one or more components

3: Adequate depth, breadth or insight – satisfactory completion

4: Beyond expected depth, breadth or insight – satisfactory completion

5: Excellent description, analyses and critique – satisfactory completion

**Appendix 3: D2 EBD Elements**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Resources applying EBD** | | |
| Order | Objective | Source | Link |
| 1 | Review EBD concepts with emphasis on PICO | Introduction to Evidence Based Practice 5th Edition (Duke-UNC) *Ask/Acquire* | http://www.hsl.unc.edu/services/tutorials/ebm/index.htm |
| 2 | Review research designs | Centre for Evidence Based Medicine (Oxford) *Study Designs* | http://www.cebm.net/index.aspx?o=1039 |
| 3 | Review 5 Step Process | Introduction to Evidence Based Practice 5th Edition (Duke-UNC) *What is/Appraise* | http://www.hsl.unc.edu/services/tutorials/ebm/index.htm |
| 4 | Introduce Clinical Recommendations | American Dental Association: Center for EBD *Clinical Recommendations* | http://ebd.ada.org/ClinicalRecommendations.aspx |
| 5 | Review statistical concepts | Schork MA. Statistics by Zooth. N Y State Dent J. 2007; 73:30-37. | http://www.ncbi.nlm.nih.gov/pubmed/17969477 |
| 6 | Introduce Critical Summaries | American Dental Association: Center for EBD *Critical Summaries* | http://ebd.ada.org/SystematicReviews.aspx |
| 7 | Review Cochrane systematic reviews | The Cochrane Library | http://www.thecochranelibrary.com/view/0/index.html |
| 8 | Introduce critical appraisal worksheets | Centre for Evidence Based Medicine (Oxford) *Critical Appraisal* | http://www.cebm.net/index.aspx?o=1157 |
| 9 | Review and appraise meta-analyses | [Lawrentschuk N](http://www.ncbi.nlm.nih.gov/pubmed?term=Lawrentschuk%20N%5BAuthor%5D&cauthor=true&cauthor_uid=19624816), [McCall J](http://www.ncbi.nlm.nih.gov/pubmed?term=McCall%20J%5BAuthor%5D&cauthor=true&cauthor_uid=19624816), [Güller U](http://www.ncbi.nlm.nih.gov/pubmed?term=G%C3%BCller%20U%5BAuthor%5D&cauthor=true&cauthor_uid=19624816). Critical appraisal of meta-analyses: an introductory guide for the practicing surgeon. [Patient Saf Surg.](http://www.ncbi.nlm.nih.gov/pubmed/19624816) 2009 Jul 22;3(1):16. doi: 10.1186/1754-9493-3-16. |  |
| Shea BJ, Grimshaw JM, Wells GA, Boers M, Andersson N, Hamel C, Porter AC, Tugwell P, Moher D, Bouter. Development of AMSTAR: a measurement tool to assess the methodological quality of systematic reviews. BMC Medical Research Methodology 2007, **7**:10 doi:10.1186/1471-2288-7-10.  http://www.pssjournal.com/content/3/1/16 | http://www.biomedcentral.com/1471-2288/7/10 |
| 10 | Introduce PubMed Clinical Queries | PubMed Clinical Queries | http://www.ncbi.nlm.nih.gov/pubmed/clinical |

**Appendix 4: D2/D3 EBD Readings**

|  |  |  |  |
| --- | --- | --- | --- |
| **Resources sharing professional perspective or knowledge** | | | |
| Year | Order | Objective | Source |
| D2 | 1 | To present strategies for addressing lay medical news | Making sense of medical news. Consumer Reports on Health. 2005; 5:8-9. |
|  | 2 | To present a J Am Dent Assoc editorial on EBD | Niederman R, Clarkson J, Richards D. The Affordable Care Act and evidence-based care. J Am Dent Assoc. 2011; 142:364-367. |
|  | 3 | To present the rationale for American Dental Association’s critical summaries | Niederman R. Evidence-based dentistry finds a new forum. Exelauno. J Am Dent Assoc. 2009; 140:272-273. |
|  | 4 | To remind students ‘newsy’ and ‘quality’ science are not synonymous | Begley S. Why almost everything you hear about medicine is wrong. Newsweek. 2011; January 31: 8-9. |
|  | 5 | To review causality in cross sectional designs and biological plausibility | Hujoel PP, Cunha-Cruz J, Kressin NR. Spurious associations in oral epidemiological research: the case of dental flossing and obesity. J Clin Periodontol. 2006; 33:520-523. |
|  | 6 | To provide guidance in writing and reading scientific manuscripts | Gopen GD, Swan JA. The science of scientific writing. American Scientist. 1990; 78:550-558. |
|  | 7 | To review common sense | Smith GCS, Pell JP. Parachute use to prevent death and major trauma related to gravitational challenge: a systematic review of randomized controlled trials. Brit Med J. 2003; 327:1459-1461. |
|  |  |  |  |
| D3 | 1 | To review the rationale for EBD | TED Talks. Ben Goldacre: Battling Bad Science.  http://www.ted.com/talks/ben\_goldacre\_battling\_bad\_science.html |
|  | 2 | To review EBD in patient care | Centre for Evidence Based Medicine (Oxford) *Making a Decision.*  http://www.cebm.net/index.aspx?o=1854 |
|  | 3 | To review critical appraisal process | Hill A, Spittlehouse C. Hayward Medical Communications, Hayward Group Ltd. 2009: What is Critical Appraisal? http://meds.queensu.ca/medicine/obgyn/pdf/what\_is/WhatisCriticalAppraisal.pdf |
|  | 4 | To present misleading claims in clinical research | Montori VM, Jaeschke R, Schünemann, Bhandari M, Brozek JL, Devereaux PJ, Guyatt, GH. Users’ guide to detecting misleading claims in clinical research reports. Brit Med J. 2004; 328:1093-1096. |
|  | 5 | To introduce Practice Based Research Networks | Niederman R, Leitch J. “Know What” and “Know How”: Knowledge creation in clinical practice. J Dent Res. 85:296-297, 2006. |
|  | 6 | To present strategies for using EBD in practice | Abt E, Bader JD, Bonetti D. A practitioner’s guide to developing critical appraisal skills: translating research into clinical practice. JADA 2012; 143(4):386-390. |
|  | 7 | To review statistical analyses | Abt E. Understanding statistics 1. Evid Based Dent. 11: 60-61, 2010.  Abt E. Understanding statistics 2. Evid Based Dent. 11:93-94. 2010.  Abt E. Understanding statistics 3. Evid Based Dent. 11:118. 2010. |
|  | 8 | To review statistical analyses | Abt E. Understanding statistics 4. Evid Based Dent. 12:25-27. 2011.  Abt E. Understanding statistics 5. Evid Based Dent. 12:57-58. 2011.  Abt E. Understanding statistics 6. Evid Based Dent. 13:29-31, 2011. |

**Appendix 5: D2 EBD Element Activity Examples**

**Research Design Review (#2)**

1. Objective: to review designs, including their advantages and disadvantages
2. Centre for Evidence Based Medicine (Oxford CEBM) <http://www.cebm.net/index.aspx?o=1039>
3. Activity: Submit responses on ICON:
   1. Select a research manuscript, either new or previously read.
      1. Identify the manuscript.
   2. Identify the research design for this manuscript.
      1. What is the design?
      2. How did you arrive at your answer?
      3. Outline the advantages and limitations of this design.
   3. Identify 2 other designs that could have been used to address the research question.
      1. List the two designs.
      2. Outline the advantages and limitations of the proposed designs.

**ADA Critical Summaries (#6)**

1. Objective: to introduce ADA’s critical summaries
2. American Dental Association’s Center for EBD http://ebd.ada.org/SystematicReviews.aspx
3. Activity: Select a topic of interest from ADA’s systematic review’s website. Submit responses on ICON.
   1. Identify a systematic review with a critical summary.
   2. Skim the systematic review and read the critical summary.
   3. Appraise the summary using *Iowa EBD Critical Summary Critique*.
4. What is your reaction to the critical summary? I.e., is it consistent with your prior, ‘known’ knowledge – and what we’ve been teaching?

**Appendix 6: D2/D3 EBD Reading Activity**

**EBD Reading Activity Format**

1. Read assigned reading.
2. Summarize content in your own words (1 paragraph minimum).
3. Respond to the article using one of the following formats (1 paragraph minimum). Identify which format you are using.
   1. Describe your reaction to the content and explore/explain why you had your reaction.
   2. Challenge the content.
   3. Make connections between the content and other readings/lectures/common knowledge.
4. Submit summaries and responses on ICON

**Appendix 7: D2/D3 EBD Exercise Activity Examples**

**D2 EBD Exercise #3**

1. Objective: to practice the 5 steps of EBD, using different sources of information.
2. **Assess** the patient: describe a puzzling clinical, course content or personal situation (if you are not in clinic)
3. **Ask** a question: Using the PICO format, construct a question
4. **Acquire** the evidence
   1. 1 original article
   2. 1 ADA Critical Summary **OR** 1 ADA Clinical recommendation
5. **Appraise** the evidence using guidelines from previous exercises
   1. Note – Yes/no responses are not acceptable; provide rationale
   2. Original article: *Research Manuscript Critique*
   3. Critical Summary: *Iowa EBD Critical Summary Critique*
   4. Clinical Recommendation: Richards & Clarkson Rapid Guideline Assessment
6. **Apply** the evidence (conceptually): How would you use this piece of evidence to address your ‘clinical’ situation?

**D3 5 Step EBD Exercise Format**

* + - 1. **Assess** the patient: describe your clerkship patient, including patient goals.
      2. **Ask** a question: Using the PICO format, construct a question.
      3. **Acquire** the *best available* evidence: Identify **1** original research manuscript and **1** other source that address your PICO question. The second source could be a critical summary, a clinical recommendation, or another original research manuscript.
      4. **Appraise** the evidence: Appraise each source using one the following formats:
         1. Original research articles

Marshall’s D3 Research Manuscript Critique

Found on D3 ICON site

A critical appraisal summary:

Sources

Centre for Evidence Based Medicine – Oxford CEBM: <http://www.cebm.net/index.aspx?o=1157>

UNC Health Sciences Library: <http://guides.lib.unc.edu/content.php?pid=137375&sid=1180739>

Dartmouth Biomedical Libraries: <http://www.dartmouth.edu/~library/biomed/guides/research/ebm-resources-materials.html>

Types:

Systematic Review Critical Appraisal Worksheet

Diagnostic Critical Appraisal Worksheet

Prognosis Critical Appraisal Worksheet

RCT/Therapy Critical Appraisal Worksheet *NOTE: Dartmouth has a Therapy worksheet for continuous outcomes at the bottom*

* + - * 1. Critical summaries (i.e., ADA, Evidence Based Dentistry, Journal of EBD)

Iowa EBD Critical Summary Critique

* + - * 1. Clinical recommendation (i.e., ADA EBD site)

1. Richards & Clarkson Rapid Guideline Assessment
   * 1. Appraisal of Guidelines Research and Evaluation - complete pages 17-19. [www.**agree**trust.**org**/?o=1085](http://www.agreetrust.org/?o=1085)

5. **Apply** the evidence (conceptually): How would you use this piece of evidence to address your ‘clinical’ situation given your experience and the patient’s goals?

6. **Reflect**:

* + - * 1. What did you learn from this exercise?
        2. How would you do this exercise differently next time?

**Appendix 8: D2/D3 Iowa Research Manuscript Critique**

**Research Manuscript Critique Format**

1. Manuscript Objective:
   1. What is the research question/hypothesis?
      1. Does the research question/hypothesis address your PICO question?
2. Manuscript Methods:
   1. What is the research design?
      1. What is the study intervention/exposure (independent variable)?
      2. What was the study outcome (dependent variable)?
      3. What is the timeline – that is the order of gathering intervention/exposure and outcome data?
      4. Is the design appropriate for the research question?
   2. Who is the study population?
      1. Is the population generalizable to your population (PICO)?
      2. Was the population selected appropriately (i.e., adequate number, recruitment procedure, inclusion/exclusion criteria)?
   3. What was/were the study protocol and techniques?
      1. Was the overall protocol logical?
      2. Did the techniques adequately assess the intervention/exposure and outcome?
      3. Do the methods appear adequate to address the research question?
   4. What statistical analyses methods were used?
      1. Basics reported:
         1. Sample size
         2. Duration of follow-up
         3. Drop outs or samples lost to follow-up reported
      2. Details
         1. Statistical tests used reported (appropriate?)
3. Manuscript Results:
   1. Did the results address the research question?
   2. Were descriptive data provided?
   3. Were appropriate comparisons with p-values provided?
4. Manuscript Discussion:
   1. Did the authors address the research question?
   2. Are their conclusions consistent with study design and methods?
   3. Are the results placed in context with other reported science?
5. *(D3 only)* Will the results help me in caring for my patient?
   1. Is my patient similar to or very different from those in the study?
   2. Is the treatment feasible for me to provide?
   3. Do the potential benefits outweigh the potential harm for my patient?

**Appendix 9: D2/D3 Iowa Critical Summary Critique**

Critical Summary Critique Format

1. Is the Critical Summary author identified, and is his/her credentials identified?
2. Is the full citation for Systematic Review being critiqued provided?
3. What length of time transpired between the Systematic Review publication and the Critical Summary publication?
   1. If the Systematic Review was more than 1 year old, was an updated search conducted by the Critical Summary author to identify new articles?
   2. If an updated search was conducted by the Critical Summary author, did she/he use a similar search strategy as the Systematic Review authors?
4. Abstract
   1. Is the clinical question (i.e., PICO) clearly stated?
   2. Were the methods (i.e., number of databases searched, inclusion/exclusion criteria, outcomes) identified?
   3. Do the main results include the number of included studies and/or subjects as well as either presentation of individual study results or a combined summary result in numerical or textual format?
   4. Is the conclusion relevant given the context of the topic?
5. Commentary
   1. Is the relevance of the question provided given the context of the current state of practice or understanding of the issue?
   2. Are the strengths and/or weaknesses (i.e, number of databases, clear inclusion/exclusion criteria, risk of bias of included studies, statistical issues) of the methodology identified?
   3. Are potential conflicts of interest acknowledged?
   4. Are the quality, quantity and consistency of the evidence identified and used to justify the conclusion? When provided, are levels of evidence justified?
   5. Are implications of the Systematic Review’s results for clinical practice presented?
      1. Are the implications appropriate?
6. Will the results help me care for my patient?

**Appendix 10: D2/D3 Richards & Clarkson1 Rapid Guideline Critique**

**Clinical Recommendation Critique Format**

1. Is the guideline easy to read and easy to follow?
2. Does it address a clearly defined clinical topic?
3. Did the authors follow a documented evidence-based system for producing the guidelines?
   1. Or, did the authors just add references to their own opinions?
4. Was the evidence found via a systematic and documented search of all relevant literature?
5. Has the evidence been appraised and graded for quality?
6. Is the evidence regularly and systematically updated?
7. Can you link directly to the evidence – all the references – that underpin each major treatment option?
8. Will the results help me care for my patients?

1Moskowitz, EM. Evidence-Based Dentistry for You and Me: the challenge of using a new educational tool. N Y State Dent J. 2009; 75(6):48-51. *Note: questions 1-7 are verbatim from the article*.

**Appendix 11: D2/D3 EBD Exercise Evaluation Grid**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Exercise Evaluation Criteria** | | | | | | | |
| **Component** | **Expectation** | **D2/D3** | **<70** | **80** | **90** | **95** | **100** |
| **Assess** | Short description |  | *Does not impact, unless question is not addressed* | | | | |
| **Ask** | Tight PICO | D2: 1-2 | Provide guidance | | | | |
| D2: 3-4 | Deduct 5 points if incorrect format | | | | |
| D3: All | Deduct 5 points if incorrect format | | | | |
| **Acquire** | Identify source | D2: All | Provide guidance relative to level of evidence | | | | |
| D3: All | Deduction for low quality evidence | | | | |
| **Appraise** | | | | | | | |
| Original Article, Critical Summary, Clinical Recommendations | Criteria components addressed: Question & commentary | D2: 1-2 | Provide guidance; deduct if yes/no responses, especially to commentary  Request repeat of assignment if inadequate (i.e., score <90 per criteria below) or missing pieces | | | | |
| D2: 3-4  D3: All | Inadequate - repeat | Missing components including commentary | All addressed adequate; Limited commentary | Detailed, adequate commentary | Detailed; excellent commentary |
| **Apply** | Conceptual – link evidence to PICO/patient | D2/D3 | If missing or gray, deduct 3-5 points  If superb, add 3-5 points | | | | |
| **Other** | | | | | | | |
| Comment on level of evidence – encourage ‘highest’ level | | | | | | | |

**Appendix 12: D4 Treatment Planning Case Presentations**

**D4 5 Step EBD Exercise Format**

* + - 1. **Assess** the patient: describe your Family Dentistry patient, including patient goals.
      2. **Ask** a question: Using the PICO format, construct a question.
      3. **Acquire** the *best available* evidence: Identify 2-3 research sources that address your PICO question.
      4. **Appraise** the evidence: Appraise each source.
      5. **Apply** the evidence (conceptually): How does this knowledge influence the management of this case?
      6. **Reflect**:
         1. What did you learn from this exercise?
         2. How would you complete this process differently next time?

**Appendix 13: D4 Clinical Application**

**Integration and Application of Evidence-Based Decision Making**

**Description:**

Family Dentistry students receive daily assessment and feedback as they comprehensively manage and treat assigned patients in the clinical environment. Integration of Evidence-Based Dentistry is one of six integral domains assessed.

**Purpose:**

* To reinforce application of skills acquired in the D1- D3 years to accomplish an evidence-based practice
* To reinforce the use of scientific literature to address clinical questions
* To reinforce the use of scientific evidence to support rationale for recommended treatment
* To reinforce critical thinking and independent learning skills

**Rubric for Daily Assessment:**

Met Expectations, Surpassed Expectations, Failed to Meet Expectations