Investigation of an Additional Critical Thinking Outcomes Measure: The Efficacy of Critical Thinking Assessments in Predicting Clinical Success

Julia Appel, OD
Rochelle Mozlin, OD

Abstract

Background: Critical thinking assessment has been noted to be fraught with difficulty especially in the area of clinical care. Guidelines from the Association of Schools and Colleges of Optometry and SUNY College of Optometry’s Strategic Plan both stress the need to insure that students are successful critical thinkers. This study aimed to determine the predictive value of written case-based analyses for clinical success.

Methods: Seventy-five optometry students were subjects whose grades on case-based written analyses were compared with their grades in clinic (both overall and in areas specific to assessment and management).

Results: Although positive trends were noted, no predictive value was found between the students’ grades on their written analyses and their clinical grades.

Conclusion: Case-based written assignments are one of several tools that can be used to assess a student’s critical thinking, but they should not be used at the exclusion of other assessments.

Key Words: critical thinking, clinic

Introduction

The 2011 report of the Association of Schools and Colleges of Optometry (ASCO), Attributes of Students Graduating from Schools and Colleges of Optometry, recommends that faculty at optometric institutions “develop, monitor and maintain a set of educational outcomes that: include effective and comprehensive assessment methods that provide accurate and reliable data on the achievement of specific and related outcomes.” The importance of critical thinking as a requirement of a successful practitioner is emphasized in the following excerpts, which define the characteristics of the new Doctor of Optometry:

· The ability to acquire, analyze and apply new information while making reasonable and informed decisions that are consistent with the interests and needs of the patient and broader community

· Problem-solving and critical-thinking skills that integrate current knowledge, scientific advances and the human/social dimensions of patient care to assure the highest quality of care for each patient

· The critical-thinking skills needed to assess the patient’s visual and physical status and to interpret and process the data to formulate and execute effective management plans

These recommendations are embedded in the Strategic Plan of the State University of New York, College of Optometry (SUNY Optometry), which calls for the college “to deliver a customizable professional degree program that ensures active integrated learning while preparing students for problem-oriented patient care.” Critical thinking is a high priority as emphasized by the following objective: “Ensure the curriculum effectively integrates basic and clinical sciences and teaches critical thinking and the principles of evidence-based practice.” (page 6)

What is “critical thinking”? The process has been described by the American Philosophical Association as follows: “We understand critical thinking to be purposeful, self-regulatory judgment...”
which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological and contextual considerations upon which the judgment is based. The end result is the ability to make decisions to guide actions during patient care.

Two questions become paramount when acknowledging the importance of critical thinking: 1) how can students be taught to be better critical thinkers? and 2) how can a student’s ability to think critically be assessed? Responses in literature are vast in these areas. In regard to the first question, some older schools of thought state that there is only the need for more experience to advance from competent to expert, but more recent thinking about critical thinking argues that this is not the case. As Groves et al. show, appropriate data collection and content knowledge do increase with experience, but the potential for misdiagnosis is still present despite growth in these other areas. Despite greater teaching emphasis on clinical practice guidelines, Facione and Facione note the need for critical thinking in order to use protocols appropriately and achieve expected outcomes. Therefore, students must be taught how to think critically in addition to promoting their acquisition of the skills, procedures and content knowledge needed to be successful clinicians.

Teaching strategies that contribute to critical thinking development are summarized well in the Perspectives paper published by the American Dental Education Association (ADEA). According to the ADEA, instructors should encourage independent thinking via: a) questioning the group members while modeling their own thought processes regarding the most important aspects of each case; b) encouraging students to compare their self-directed learning results to their instructors’ analyses; and c) instituting written assignments that not only require independent research to analyze problems, but encourage formulation of defense for management choices. In an effort to teach critical thinking skills, many of these structural and pedagogical strategies have been incorporated into the curriculum at SUNY Optometry.

It is the second question concern-
In the Primary Care clinic, the third-year students are broken into small groups called “pods” consisting of six to seven interns with two faculty instructors. Each pod is scheduled for six hours of patient care and one hour of IS each week. The fall and spring semesters are each composed of eight-week blocks. Over each block, each student will work with each instructor approximately four times. Pod assignments are then shuffled at the end of an eight-week block. This scheduling paradigm gives every third-year student the opportunity to work with and be evaluated by as many as eight faculty instructors over the two semesters. Primary Care clinical evaluations are provided on a weekly basis by the instructor to whom the student is assigned. Instructor teams also provide a summary team evaluation for their interns at the end of each eight-week block. Each semester, 16 to 18 evaluations are generated and averaged to derive each student’s clinic grade.

Evaluations of clinical performance include these five areas:

- Subjective Information/Data (appropriately obtains and documents pertinent information; understands the significance of the patient’s systemic and ocular presentation and history)
- Objective Information/Data (demonstrates the ability to choose and accurately perform appropriate testing based on the patient’s presentation/needs)
- Case Analysis/Assessment (demonstrates understanding of basic and clinical science knowledge as applicable to patient’s presentation and identifies processes leading to dysfunction and disease)
- Management/Plan (demonstrates understanding and applies current standards of care in all aspects of practice, able to develop an appropriate action plan)
- Professional Responsibility/Elements of Professional Conduct (demonstrates appropriate patient rapport, empathy, ethical practice, time efficiency, conduct, dress and hygiene; accurate, clear and concise chart/notes)

For each of the above key areas of clinical performance assessment, faculty instructors rank each student’s performance according to three descriptors: exceeds expectations, meets expectations and does not meet expectations. Over the course of their third year, as the students gain experience and knowledge, the threshold to meet the expectation level for each descriptor rises accordingly. Each semester, the final clinic grade for these third-year students was determined by calculating the percentage of exceeds expectations, meets expectations and does not meet expectations. This was then translated to both a numerical score (from 0-4) and a letter grade with the following guidelines: >30% exceeds = A (range 3.5-4.0), 20% not met = C (range 2.0-2.75), 30% not met = F (<2.0) and grades for each semester were subsequently averaged.

**Determination of Grades for IS**

Each student is given a grade for performance in IS collaboratively by their pod’s two faculty instructors at the end of each semester; therefore, over the two semesters they receive four grades from eight instructors. For these third-year students, the case-based assignments were included in their IS grades. Therefore, in the fall, the IS grade was derived from participation, one case-based assignment and a final PowerPoint presentation. In the spring, the IS grade was based upon participation and two case-based assignments (Appendix A). The average of the fall and spring IS grades was used as the overall grade in IS for our study investigation.

**Case-Based Assignments**

With the guidance of a consultant, a
rubric was developed to guide the grading of the three case-based assignments. In addition, information regarding the purpose of the exercise: to enhance and evaluate the intern’s ability to think critically regarding patient care was also created (Appendix B). Both the rubric and information were distributed to the students in advance of their first case-based assignment to enhance their appreciation of the learning outcomes, realize expectations for the assignments, and enable them to maximize their scores. Each case was presented as a patient’s chart containing all necessary information including: chief complaint, case history and examination data. Assignment scoring was based on a maximum of 20 points with the following point distribution:

- Ability to use history and examination findings to guide understanding (4 points)
- Ability to develop differential diagnosis/select appropriate diagnosis and demonstrates sound supportive reasoning for each problem identified (4 points)
- Ability to suggest further appropriate testing (4 points)
- Ability to develop management options based on case (4 points)
- Ability to explain evidence for management options based on patient presentation and the literature (4 points)

The cases increased in complexity over the two semesters and incorporated appropriate content based on didactic course work. All three case-based assignments were submitted via Moodle (Modular Object-Oriented Dynamic Learning Environment open-source community-based electronic course management system, www.moodle.com) and were graded by a single individual (the instructor of record for third-year IS and this study’s principal investigator). The final grade for the case-based assignments was determined by summation of the scores from each of the three cases with a maximum yield of 60 points.

**Statistical Analysis**

Data from 75 subjects were utilized for analysis. All scores were presented as a percentage of the maximum score (from 0-1.00, with 1.00 representing a grade of 100%). The following four variables were provided (the terms in parentheses show the shortened variable names used in the plots):

- Critical thinking case-based assignment grade (ctcases)
- Overall IS grade (isgrade)
- Critical thinking clinic grade for assessment and management (ctclinic)
- Overall clinic grade (clingrade)

Distributions of the four scores were presented graphically using a box-and-whiskers plot. The box in each case extends from the 25th to the 75th percentile, i.e., includes the middle 50% of the data. The solid line within a box shows the median score. The whiskers are drawn to the furthest point that is no more than 1.5 times the length of the box from each edge of the box. Outliers are shown in red and are labeled with the subject identifier.

Analyses of the relationships between scores were done using ordinary linear regression. The correlation between each pair of scores was summarized using the Pearson correlation. P-values for testing whether the Pearson correlation was different from 0 are also presented. Both confidence intervals and hypothesis tests for the Pearson correlation were performed based on the Fisher transformation.

Scatter-plots were used as graphical comparisons for each pair of variables. These plots included a superimposed fitted regression line as well as 95% confidence bands and 95% prediction bands. The confidence bands reflect how well the model has been fitted to the overall dataset. However, as the primary goal of this study was to determine whether the critical thinking case-based assignment grade (ctcases) could predict the critical thinking clinic grade (ctclinic) for individual students, the plots also show 95% prediction bands, which show the ranges of individual ctclinic scores that would be predicted for an individual with a given ctcases score. More specifically, they show the ranges within which 95% of future predictions are expected to fall. All statistical analyses were performed in R, Version 3.0.2.

**Results**

The distributions of scores for the four variables are shown in **Figure 1** using a box-and-whiskers plot.

Note: Subject #18 had three out of four scores that were outliers with two of the four being well-removed from the...
scores of the rest of the class. Hence, this subject was excluded from calculations of correlations and regression lines because of the undue influence that the single subject might have on the results.

The primary analysis evaluated how well ctcases score predicts ctclinic score. Figure 2 shows a scatter-plot of these two variables with a superimposed linear regression line. The plot also shows 95% confidence bands and a 95% prediction interval. The confidence bands reflect how well the model has been fitted; the 95% prediction interval shows the ranges of ctclinic predictions for individual subjects for each given ctcases score. More specifically, they show the ranges within which 95% of future predictions are expected to fall. The reason they are so much wider than the confidence intervals is because the scatter of the individual points around the fitted line is large, thus when one is trying to predict the ctclinic score for a single subject, the variability must be incorporated.

Table 1 shows the summary statistics for the fit of the line and for the Pearson correlation coefficient.

There is a tendency for higher ctcases scores to be associated with higher clingrade scores as reflected by both the slope and correlations being statistically different from 0 (0 not included in 95% confidence interval). Note also that the intercept is different from 0 indicating that clingrade scores tend to be higher than the ctcases scores, something that is also apparent from the box plot in Figure 1.

Secondary Analyses

Two additional relationships were explored:

- The relationship between the ctcases score and the overall clingrade score
- The relationship between the overall isgrade score and the overall clingrade score

Figure 3 shows the results for ctcases score vs. the overall clingrade score and Table 2 provides the summary statistics.

There is essentially no difference between this relationship and that seen
earlier between the ctcases and ctclinic scores.

Figure 4 shows a comparison of the overall isgrade score vs. the overall clingrade score, and Table 3 provides the summary statistics.

In the case of the overall scores, the ability of the isgrade score to predict the overall clinical score is superior to those seen for the other variables.

Table 4 summarizes all correlations between the variables. For example, the correlation just observed between the clingrade and isgrade of 0.71 is shown when row = clingrade and column = isgrade or vice-versa. The strong correlations seen between ctclinic and clingrade scores and between ctcases and isgrade are partially a result of the fact that ctclinic and ctcases are subcomponents of the overall clingrade and isgrade scores, respectively.

Discussion

Many factors affect the ability to assess critical thinking success and it is important to remember that “qualitative data can inform researchers about intervention effects that are not easily captured by quantitative instruments.”

Moderate positive trends are shown among our data sets indicating that case-based assignment success or difficulty can be used as one piece of information to assess overall clinical reasoning ability but it cannot be used as a predictor of clinical success and clinical thinking success. The ability to glean useful information from the case-based analyses is apparent when looking at individual data, as some interns who performed only adequately in clinic performed well on these slower paced, more analytical assignments and others that performed very well clinically achieved only adequate grades on these assignments. In this regard, other strengths and difficulties such as communication skills or willingness to invest time in completion of the assignments are elicited. For example, a subject who performed well in clinic scored poorly on the written task due to writing skills and the inability to clearly express thinking in written form due to English not being the subject’s first language.

Limitations of this study include the fact that the assessment of clinic per-

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.55</td>
<td>(0.34-0.72)</td>
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<tr>
<td>Slope</td>
<td>0.42</td>
<td>(0.18-0.67)</td>
</tr>
<tr>
<td>Pearson’s Correlation</td>
<td>0.37</td>
<td>(0.16-0.55)</td>
</tr>
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</table>

Table 3

Fit Statistics for Modeling clingrade Score as a Function of isgrade Score

<table>
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<th>Estimate</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.16</td>
<td>(-0.01 - 0.34)</td>
</tr>
<tr>
<td>Slope</td>
<td>0.85</td>
<td>(0.66 - 1.05)</td>
</tr>
<tr>
<td>Pearson’s Correlation</td>
<td>0.71</td>
<td>(0.58 - 0.81)</td>
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Table 4

All Correlations

<table>
<thead>
<tr>
<th>ctcases (p=)</th>
<th>isgrade (p=)</th>
<th>ctclinic (p=)</th>
<th>clingrade (p=)</th>
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</thead>
<tbody>
<tr>
<td>1.00</td>
<td>0.64</td>
<td>0.35</td>
<td>0.37</td>
</tr>
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<td>()&lt;0.0001</td>
<td>()&lt;0.0001</td>
<td>()&lt;0.0001</td>
<td>()&lt;0.0001</td>
</tr>
<tr>
<td>0.64</td>
<td>1.00</td>
<td>0.65</td>
<td>0.71</td>
</tr>
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<td>()&lt;0.0001</td>
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<td>()&lt;0.0001</td>
<td>()&lt;0.0001</td>
</tr>
<tr>
<td>0.35</td>
<td>0.65</td>
<td>1.00</td>
<td>0.87</td>
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<td>()&lt;0.0001</td>
<td>()&lt;0.0001</td>
</tr>
<tr>
<td>0.37</td>
<td>0.71</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>()&lt;0.0001</td>
<td>()&lt;0.0001</td>
<td>()&lt;0.0001</td>
<td>(1.00)</td>
</tr>
</tbody>
</table>
many advantages, which have been noted by the same faculty members. The plotting of the overall IS grade against the clinical assessment and management grade (.64) and overall clinic grade (.71) are shown to have stronger positive correlations than seen with the case-based analyses. These last data sets may be at least partially skewed by the fact that the same faculty members are providing 60%-80% of overall IS grade and 100% of the clinic-based grades without masking. While attempts are made to minimize personal bias that sometimes accompanies the grading consensus via specific rubrics and multiple graders, there is always the potential for it and such are the well-known pitfalls of clinical evaluation. Also, the lack of masking of the students’ written case analyses when graded by the instructor of record has the potential to introduce bias. Future investigations could be designed such that any written analyses are graded without student identification or by an unaffiliated examiner.

Despite the inability to utilize a case-based assessment as a primary predictor of clinical success, third-year IS will continue to employ case-based assignments to teach critical thinking skills. Boshuizen and Schmidt\(^1\) reason that students must be given adequate opportunities to test their knowledge and establish connections between concepts in order to detect gaps in their knowledge and critical thinking skills. With the appropriate stimuli and feedback, they will self-direct their learning to fill these gaps. These learning opportunities need not be live patients. Indeed it might be more effective to use structured “paper cases” in which the degree of complexity can be controlled and students can first learn to diagnose and manage more common clinical entities. It should be noted, that the one subject whose data was removed from the study analysis has struggled both clinically and didactically. The results of these case-based assignments demonstrated gaps in both knowledge and critical thinking skills and provided feedback as a first step in remediation.

The use of case reports in teaching has many advantages, which have been summarized as follows by Rivett and Jones:\(^2\)

- The level of complexity and focus of the case can be tailored to the learning needs of the student.
- All students are exposed to the same predetermined learning experience.
- Self-paced and self-directed learning is facilitated by accessibility and portability.
- Accompanying resources can be provided to enhance the learning potential of the case.
- There is no risk to the patient or the student; mistakes can be made with minimal consequences.
- Feedback is available.
- Case reports help instill confidence in the student for real-time clinical work.

There are, however, limitations to the use of case reports to teach critical thinking. Sefton, Gordon and Field\(^3\) note that case reports fail “to exploit the power of active inquiry learning.” When case reports are viewed as additional didactic assignments, students may not spend the time required for independent learning and consolidation. In fact, this perception may have contributed to the lower correlations seen between scores on the case-based assignments and clinic grades.

Faucer, Tardif and Chamberland\(^4\) have analyzed the clinical reasoning of competent vs. expert-level optometrists and their results are not surprising: Expert-level optometrists are more patient-centered, more problem-oriented during the exam, are able to multi-task, and develop a management plan during the entire examination process. They conclude that optometry students must be exposed to multiple, varied and representative clinical cases and must be provided with consistent feedback. Every school and college of optometry, including SUNY Optometry, has a mission, goals and objectives that are consistent with this conclusion as well as with ASCO’s recommendations. Determining and measuring clinical opportunities for students to obtain this goal are far easier than assessing whether students have attained competent critical thinking skills. Facione and Facione\(^5\) point to the need for a diversity of assessment tools including multiple choice exams and the use of rubrics in both didactic and clinical settings. Perhaps Schuwirth\(^6\) asks the most relevant question: “Is assessment of clinical reasoning still the Holy Grail?” Can critical reasoning be measured as a separate entity using one specific assessment tool? Or should development focus on a programmatic approach that allows a profile of a student’s strengths and weaknesses to emerge from multiple sources? Clinical education at SUNY Optometry will be considering these questions as the implementation of the new strategic plan continues to move forward.

**Conclusion**

Although trends were noted, case-based assignments did not provide a statistically significant predictive value for critical thinking in a clinical environment. Therefore, these assignments cannot be used as a stand-alone outcome measurement to assess the attainment of relevant goals and objectives in SUNY Optometry’s strategic plan. Nonetheless, these case-based assignments will remain as a requirement in third-year IS as an important method of teaching essential thinking skills. The Department of Clinical Education is beginning to direct time and energy toward the development of student portfolios, which will enable individualized educational programs. It is likely that various methods of assessment will be required as students choose different pathways to obtain their professional degrees. Perhaps case-based assignments will re-emerge as one of many instruments in an array of assessment tools.

**Acknowledgements**

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**References**


Appendix A: Integrative Seminar Grading Rubrics

Daily Participation (includes intern’s own presentations and involvement in general discussion):

Prepared to present cases: 0-6 pts
Presents cases succinctly and in an organized fashion: 0-6 pts
Performs purposeful evaluation of the literature, utilizing evidence-based medicine where possible: 0-6 pts
Participates actively in discussions: 0-6 pts
Shows evidence of experience-appropriate critical thinking: 0-6 pts

(Always 6 pts; Usually 4 pts; Rarely 2 pts; Never 0 pts)

Total 30 pts

Final Presentation: A 10-minute PowerPoint presentation on a topic of interest on a case the intern has seen that includes information on the clinical assessment/management/basic science foundation/use of evidence-based medicine. Each intern will present during the last few weeks of the semester on a schedule set by the faculty. After the presentation is made during the intern’s integrative seminar (IS) session, the final presentations will be submitted on Moodle (Modular Object-Oriented Dynamic Learning Environment).

Preparation of presentation: appropriate graphics and fonts, easy to follow (5 pts); basic presentation with no glaring errors (3 pts); misspelling, incomplete data (1 pt)
Presentation: speaks well and engages (5 pts); rarely reads from slides, often looks at audience (3 pts); difficulty connecting with audience (1 pt)
Demonstrates knowledge of topic: excellent (5 pts); adequate (3 pts); poor (1 pt)
Research: high quality, appropriate (5 pts); adequate but does not cite seminal sources (3 pts); poorly researched (1 pt)

Total 20 pts

Case Analysis: Data will be provided. The intern will then independently submit a written analysis of the case on Moodle. See grading rubric below.

Total 20 pts

Integrative Seminar VII
Case Analysis Grading Rubric

<table>
<thead>
<tr>
<th>Able to use history and exam findings to guide understanding:</th>
<th>Identifies most pertinent historical factors/exam findings (4 pts)</th>
<th>Identifies some pertinent factors/ findings (2 pts)</th>
<th>Unable to identify pertinent history or findings (0 pts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Able to develop DDx/select appropriate diagnosis and demonstrates sound supportive reasoning for each problem identified:</td>
<td>Differential is pertinent to patient’s presentation and most appropriate diagnoses based on sound reasoning (4 pts)</td>
<td>Correct diagnoses but based on poor reasoning (2 pts)</td>
<td>No differentials are pertinent to the case/ Incorrect diagnoses and poor reasoning (0 pts)</td>
</tr>
<tr>
<td>Able to suggest further appropriate testing:</td>
<td>Most/all tests that are relevant (4 pts)</td>
<td>Few tests recommended (2 pts)</td>
<td>None or irrelevant testing recommended (0 pts)</td>
</tr>
<tr>
<td>Able to develop management options based on case:</td>
<td>Includes most/all appropriate options (4 pts)</td>
<td>Few management options suggested (2 pts)</td>
<td>Inappropriate management based on case (0 pts)</td>
</tr>
<tr>
<td>Able to explain evidence for management options based on patient presentation and the literature:</td>
<td>Utilizes patient presentation and evidence-based care (4 pts)</td>
<td>Gives some evidence but not thorough or inclusive (2 pts)</td>
<td>Unable to provide appropriate evidence for care (0 pts)</td>
</tr>
</tbody>
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Intern:  
Result:
Critical Thinking:
This assignment is geared toward getting you to think critically about how you manage your patients. Success in critical thinking is essential to becoming an accomplished clinician. The process has been described by the American Philosophical Association in 1990 in its statement:

“We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based...”

In short, it means we have to examine our thinking process so that we are making our judgments based on applying what we know in light of all possibilities in an open-minded and reflective way but which is based firmly on evidence. We are internally talking through our thinking process in real time.

For this assignment, you will use the constructs of critical thinking (also known as clinical reasoning or clinical judgment) to build a written analysis of a case, thereby achieving the following learning outcomes:

Learning Outcomes:
1. Students will identify pertinent Hx and findings that should be addressed in this patient’s care.
2. Students will interpret and assess the results to determine an inclusive differential diagnosis (min 2 and max 4 differentials) for all issues (max 4 issues) pertinent to the patient’s presentation (if no differential exists, then say so). They will choose the most likely diagnosis and explain their thought process regarding this decision.
3. Students will identify additional testing to help support/define the likely diagnosis (max 4 tests.)
4. Students will be able to provide inclusive management options for each problem/Dx identified based on the case.
5. Students will explain and justify their management plan supported by didactic knowledge and independent evidence-based research.

Example:
A 54 y.o. Type II diabetic patient presents for care with reduced acuity in the left eye of recent onset.
1. Student will need to identify any issues in the Hx that could contribute to this (ex: efficacy of medical control of the patient’s DM, prior retinal complications of diabetes, prior trauma, loss of most recent eyeglasses, etc.) as well as findings in the exam (findings such as uncorrected refractive error, the presence of a cataract OS, large anisometropia or strabismus, parafoveal retinal hemorrhages and thickening) to help develop an inclusive differential Dx.
2. Students will need to look at refractive error, visual acuity and ocular health results to determine the most likely contributing factor and must explain their reasoning (Ex: refractive error shows minimal change and does not increase BVA, the large anisometropia is longstanding and amblyopia is unlikely cause of the recent onset of the VA reduction, cataract is mild and is not consistent with the reduced VA. Therefore, it is most likely the CSME/DR that is the cause of the reduced BVA).
3. Students will suggest additional testing (such as an OCT and/or FA in the presence of CSME, etc.)
4. Students will discuss appropriate management options regarding the acuity and disease processes that were identified as issues requiring intervention.
5. Students will explain how the patient should be managed (Ex: monitor yearly, refer to retinal specialist, etc.) and use class notes and landmark studies to justify their recommendations for management (Ex: according to our notes in Ocular Disease II, the best way to manage this patient is…and this is supported by the ETDRS result which states that...).

The above process will be applied to each diagnosis you believe requires management or intervention. Answer all questions. Do your best to explain your thinking.
See Appendix A for grading rubric.