Comparison of Two Veterinary Emergency and Critical Care Clerkship Grading Protocols

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Comparison of Two Veterinary Emergency and Critical Care Clerkship Grading Protocols

Bobbi J. Conner ■ Linda S. Behar-Horenstein ■ Yu Su

ABSTRACT

Universal guidelines for evaluating veterinary students' clinical clerkship performance are unavailable. At our institution, each service determines its own grading protocol. In this study, researchers compared clinician, staff, and student perceptions of a traditional and newly devised grading practice on the Emergency and Critical Care (ECC) clerkship. ECC clinicians and technicians were asked to assess the existing grading protocol for the clerkship. The system was then revised to better align with clerkship objectives. The revised protocol evaluated students on 12 items encompassing knowledge, clinical, and communication skills. Following the assignment of values for each category, letter grades were calculated automatically. Clinicians and staff were invited to rate the revised grading system. Throughout the study period, a corresponding survey was sent to students shortly after they had received their clerkship grades. Students' open-ended comments were analyzed qualitatively to identify common themes. Clinicians and technicians reported that the revised protocol was more inclusive and better able to provide fair and accurate assessments of students' performances. Students were generally satisfied with both grading protocols, however, in the open-ended comments students' frequently expressed desire for more directed and timely feedback on their performance. The results of this study indicate that the graders' believed that the revised evaluation protocol provides opportunities to provide fair and accurate assessments of student performance. Overall, students were satisfied with the new protocol and have a desire for tailored feedback provided in a timely fashion.

Key words: clerkship grading, veterinary student assessment, emergency and critical care training, veterinary education, grading protocol

INTRODUCTION

The evaluation of veterinary students' clerkship performance is both vital to ensuring students are prepared for entrance into the veterinary profession and receive accurate feedback and guidance regarding their performance. Assessing students on a clinical clerkship is not often an easy task. Frequently it is subjective and perceived to be inconsistent. There is little evidence available to evaluate current methods for evaluating veterinary students[1,2]; much of what is available is regarding specific skills assessment.[1,3,4] There is also little research on the perspective of the evaluators perceptions of the assessment process in veterinary medical education.

There are no formal or universally accepted guidelines for providing assessments of veterinary students on clerkships. As a result, at our institution, a broad framework is provided for clerkship coordinators, and the details for student evaluation is determined by the clerkship coordinators and instructors for each clinical service. Each service may then determine which skills will be evaluated, who will be charged with performing the evaluations, and on what scale grades will be determined. In the case of our institution's Emergency and

Critical Care (ECC) clerkship the graders were not fully aware of how the system was determined or by whom, and there was a general sense that grades were not consistent and that students were often compared to one another, rather than a standard scale. For example, the student who was assessed to perform the best on a rotation would generally be given a higher grade, but if that student happened to be scheduled with a particularly talented group of students, they might have received a lower grade. Letter grades were assigned based on the general consensus of the graders, rather than a numeric scale, leading to the perception of inconsistency in the grade assignment. This unease with the fairness of the grading process and lack of understanding of its creation prompted the service to make changes. We elected to perform an update of our grading protocol and evaluate whether it led to improved perceptions of the grading process on our service. The existing grading protocol included the evaluation of students' performance in nine different categories with an assignment of ratings to one of four possible scores for each category: "Needs remediation," "Competent," "Good," or "Exemplary." A

Table 1: Existing and adjusted categories for student evaluation on the ECC clerkship.

Existing grading categories	Adjusted grading categories
History; Physical Examination; Differential Diagnoses and Problem List	Emergency History-Taking Skills
	Emergency Physical Examination Skills & Triage Skills
	Emergency Differential Diagnoses and Problem List
Case Analysis, Diagnostic/Therapeutic Plan, and Understanding of Emergency & Critical Care Approach	Emergency Case Analysis, Diagnostic/Therapeutic Plan, and Understanding of Emergency & Critical Care Approach
Knowledge Base, Application of Knowledge, and Clinical Thinking Skills	Knowledge Base
	Application of Knowledge and Clinical Thinking Skills and Independent Research
Technical Skills	Technical Skills
Record Keeping, Discharge Instructions, SOAPs, and Non-standard Procedures	Record Keeping (Discharge Instructions)
Patient Care and Follow-Up	Patient Care and Follow-Up
Client and/or Professional Communication and Teamwork	Client and/or Professional Communication
Participation in Clinical Rounds	Participation in and Preparation for Clinical and Teaching Rounds
Attitude, Effort, Independent Research, and Professionalism	Attitude, Effort, Professionalism, and Teamwork

brief description of the score was included for each score within each category (Appendix 1).

The ECC clerkship is a 2-week clinical rotation in which six students each are assigned a different shift that encompasses one week of "day shifts" and one week of "night shifts" with two days off for each week of the rotation. Day shifts include management of hospitalized inpatients on the service as well as receipt of new emergency cases on a walk-in basis. Students are involved with all aspects of both the inpatients and new cases. Day shift students work approximately between the hours of 7:00 a.m. and 7:00 p.m. Night shift students primarily focus on receiving new cases and do not manage inpatients; their shifts run from 3 pm until around midnight. Students on both shifts work primarily with ECC residents and rotating interns with ECC faculty supervision.

In this study, we compared two protocols for evaluating students on an ECC clerkship. We hypothesized that evaluators would prefer the revised grading protocol over the existing protocol. We surveyed both the evaluators and the students on issues of fairness, inclusiveness, suitability, and ability to provide adequate feedback. The study was approved by our Institutional Review Board (protocol # 2015-U-1112).

METHODS

Prior to implementing planned changes to the student evaluation process, student evaluators for the ECC clerkship were invited to participate in our survey-based study. An email was sent to all potential evaluators on the ECC service inviting them to participate. Several reminder emails were sent to evaluators. During the same study period, students on the ECC clerkship were sent an email invitation to complete a similar survey after completion of the ECC clerkship and receipt of their grade. Emails to the students were timed to be sent one week following the completion of the clerkship, as grades are routinely completed and distributed three to four days following clerkship completion. The grading protocol was then adjusted by the authors (BJC and LBH) in consultation with and with the approval of the remaining faculty on the ECC service as well as the Dean of Students. The intent of the changes were to address concerns posed by the ECC faculty with regard to fairness and consistency. An additional goal of the changes was to improve clarity for the students regarding performance expectations.

Grading Protocol Changes

The number and description of evaluation categories was changed (see Table 1). An effort was made to create categories that were succinct and could be evaluated separately from the other categories. For example, in the existing protocol, "History; Physical Examination; Differential Diagnoses and Problem List" was one category. It was separated into three categories: "Emergency History-Taking Skills," "Emergency Physical Examination Skills & Triage Skills," and "Emergency Differential Diagnoses and Problem List." This was done in recognition that these are separate skill sets and are important enough to warrant individual consideration. For each category listed, the rubric that included a description of the expectations for assigning student performance into each grade result was updated. With the revised protocol, an attempt was made to improve clarity of expectations for

the students. As an example, in the existing category "History; Physical Examination; Differential Diagnosis and Problem List" the description for an assessment of "Competent" in this category read, "Performs histories and examinations satisfactorily. Occasional omissions or inaccuracies; but generates acceptable list of differential diagnoses and is generally well organized. Generally prioritizes problems correctly." For the revised protocol, the description of a "Competent" student for "Emergency Physical Examination Skills & Triage Skills" is: "Physical examination is generally complete, though occasional findings are missed. May focus on less important findings that are not critical to the urgent problem at hand (e.g., focuses on dental disease in a patient with respiratory distress); Able to identify patients in shock or severe distress." Appendix 1 and Appendix 2 include the original and a portion of the updated grading schemes.

The assessment of students for the existing protocol was performed at the service's weekly meeting following completion of the rotation. This meeting included ECC faculty and residents that were able to attend the meeting that week, but did not include rotating interns or service technicians. Residents' attendance at this meeting was the most consistent, as it precedes their didactic rounds. Faculty attendance is less reliable, but usually at least four (out of seven) faculty was present. Evaluators that did not attend the meeting were not able to directly participate in grading, unless they had relayed their feedback to another member of the team that did attend. A confidential and informal discussion of the students' performances was held and a score was selected for each of the nine categories. After all categories were assigned and input into the University's online evaluation system, a letter grade was determined based on subjective assessment of their overall performance and input into the system and submitted.

For the revised protocol, a confidential survey link was sent to all possible evaluators (including ECC faculty, residents, rotating interns, and service technicians) every other week toward the end of each clerkship rotation. A total of 47 possible evaluators were included (16 clinicians and 31 technicians); however, for any given student not all possible evaluators worked with that student (i.e., due to scheduling differences). Each evaluator determined for themselves if they had worked with the student sufficiently to provide an evaluation. Evaluators were asked to follow the survey link to provide their individual assessments of each student before the service meeting. Responses were then collated before the service meeting at which time they were further discussed as a group, allowing for discrepancies to be discussed where necessary as well as participation of any evaluators that did not complete the survey in advance. Responses for those unable to attend the meeting were included in the overall assessment.

Calculation of the final grade for the revised protocol was also changed. Several possible grading scales were proposed to the ECC faculty and residents and a consensus was reached as to which scale was used (see Box 1). This scale was then programmed into the online system

Box 1: Grading scale

Each "Needs remediation" is worth 4 points
Each "Competent" is worth 6 points
Each "Good" is worth 7 points
Each "Exemplary" is worth 8 points

Total points yield a grade based on a standard A-F scale, where:

A = 93 or above
A− = 90–92.9
B+ = 87–89.9
B = 83–86.9
B− = 80–82.9
C+ = 77–79.9
C = 73–76.9
C− = 70–72.9
D+ = 67–69.9
D = 63–66.9
D− = 60–62.9
F = <60

With the following limitations:

- If you receive one or two "Competent" ratings, the highest possible grade you can receive is a B
- If you receive three or four "Competent" ratings, the highest possible grade you can receive is a B−
- If you receive five or more "Competent" ratings, the highest possible grade you can receive is a C+
- If you receive a "Needs remediation" rating for any category, the highest possible grade you can receive is a C−
- If you receive two "Needs remediation" ratings, the highest possible grade you can receive is a D+
- Three or more "Needs remediation" ratings will result in a failing grade

to be automatically calculated after the input of each category's assessment.

Upon implementation of the revised grading protocol, the new grading description and scale was provided in its entirety to the students as part of their syllabus, which was emailed to them the week before the start of the rotation. After completion of the clerkship, students were sent the same survey as those students who took the rotation before the changes. Three months after implementing the revised protocol, evaluators were re-sent the survey they had taken previously.

The ECC Grading Protocol, a five-point scale, researcher-constructed survey (where 1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree, and 5 = not applicable) was designed to give participants' perceptions of the ability of a particular emergency rotation (see Table 2) to fairly and consistently evaluate students. In our study, 16 clinicians and 31 technicians received an invitation link to

Table 2: Emergency and critical care grading protocol survey

1. All the appropriate personnel are given an opportunity to provide feedback on students' performances.

1 2 3 4 5

| Strongly agree | Agree | Disagree | Strongly Disagree | Not applicable |

2. I have been asked to give feedback on a student when I didn't have enough information to provide accurate feedback.

1 2 3 4 5

| Strongly agree | Agree | Disagree | Strongly Disagree | Not applicable |

3. I find it difficult to be objective when grading students.

1 2 3 4 5

| Strongly agree | Agree | Disagree | Strongly Disagree | Not applicable |

4. The grading system is representative of student performance levels.

1 2 3 4 5

| Strongly agree | Agree | Disagree | Strongly Disagree | Not applicable |

5. The system provides a method for giving fair/equitable feedback to students

1 2 3 4 5

| Strongly agree | Agree | Disagree | Strongly Disagree | Not applicable |

6. The feedback provided gives students enough information to know what they did well.

1 2 3 4 5

| Strongly agree | Agree | Disagree | Strongly Disagree | Not applicable |

7. The feedback provided gives students enough information to know what they need to improve.

1 2 3 4 5

| Strongly agree | Agree | Disagree | Strongly Disagree | Not applicable |

8. I feel that my opinion/voice is sometimes not represented in the overall grading of students.

1 2 3 4 5

| Strongly agree | Agree | Disagree | Strongly Disagree | Not applicable |

complete the post-test online survey via the professional and encrypted versions of SurveyMonkey. Twenty-three participants took the pre-test survey; 25 completed the post-test survey. As a result, 23 (48.9%) participants are included for the final data analysis. The Wilcoxon signed-rank test was employed to test the significant difference between pre- and post-test. All of the statistical analyses were completed using SPSS 23.

Students were sent a survey that included two open-ended questions asking students to describe what they liked and disliked about the grading protocol for the clerkship. Their responses were analyzed thematically.

RESULTS

Tables 3 and 4 showed the descriptive and test statistics for both pre- and post-test period for the evaluators. The participating evaluators showed significantly higher agreement with the following statements regarding the revised protocol: "All the appropriate personnel were given an opportunity to provide feedback on students' performances."

(mean−pre- = 2.74, mean−post- = 1.87, $p = .002$); "I was asked to give feedback on a student when I didn't have enough information to provide accurate feedback." (mean−pre- = 3.65, mean−post- = 2.48, $p = .002$); "The grading system is representative of student performance levels." (mean−pre- = 3.35, mean−post- = 2.61, $p = .034$); "The system provides a method for giving fair/equitable feedback to students." (mean−pre- = 3.48, mean−post- = 2.00, $p = .001$); "The feedback provided gives students enough information to know what they did well." (mean−pre- = 3.65, mean−post- = 2.78, $p = .015$) and "The feedback provided gives students enough information to know what they need to improve." (mean−pre- = 3.65, mean−post- = 2.61, $p = .007$). As seen across these items there was a significant decrease in the mean scores, signifying higher levels of agreement.

At total of 30 students who were evaluated under the existing protocol completed the survey, and 43 students completed the survey after the changes were implemented. We asked students to describe what they liked and did

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Table 3: Descriptive statistics for evaluators ($n = 23$) for pre- and post-test ECC grading survey

	Group	N	Mean	SD
All the appropriate personnel were given an opportunity to provide feedback on students' performances	Pre-test	23	2.74	.81
	Post-test	23	1.87	.97
I was asked to give feedback on a student when I didn't have enough information to provide accurate feedback.	Pre-test	23	3.65	1.37
	Post-test	23	2.48	.79
The grading system is representative of student performance levels.	Pre-test	23	3.35	1.30
	Post-test	23	2.61	1.27
The system provides a method for giving fair/equitable feedback to students	Pre-test	23	3.48	1.27
	Post-test	23	2.00	.80
The feedback provided gives students enough information to know what they did well	Pre-test	23	3.65	1.27
	Post-test	23	2.78	1.08
The feedback provided gives students enough information to know what they need to improve.	Pre-test	23	3.65	1.27
	Post-test	23	2.61	1.08

Table 4: Test statistics

Item	p
All the appropriate personnel were given an opportunity to provide feedback on students' performances	.002
I was asked to give feedback on a student when I didn't have enough information to provide accurate feedback.	.002
The grading system is representative of student performance levels.	.034
The system provides a method for giving fair/equitable feedback to students	.001
The feedback provided gives students enough information to know what they did well	.015
The feedback provided gives students enough information to know what they need to improve.	.007

not like about the existing and the revised grading protocol. In response to what students liked on the existing and revised protocol survey, 15 and 20 comments, respectively, were received. In response to what students did not like on the existing and revised protocol survey, 15 and 23 comments, respectively, were received.

Summary of Student Comments Regarding "liked about current grading system"

Existing grading protocol—One participant shared that clinicians graded accordingly. Another reported that the current grading systems shows them what they do well not what they need to do. One individual remarked that they liked how grades were returned promptly and three others opined that the grade was representative of their effort on the rotation. Two participants liked the grading system and one in particular the feedback received during the cage-side rounds. Another participant appreciated not being penalized in the final rotation grade for the steep learning curve, another complained that the system was vague, while one other asserted that the grading system did not make sense. One other participant reported that no constructive criticism was provided. Two participants reported that they had not yet received their final

grades and thus they chose not to respond further to this question.

Revised grading protocol—In contrast to students' perceptions about the existing grading protocol, 10 students shared that they "liked the new grading scale," that it was "fair" and helped them "understand what we need to focus on." One of the participants felt that the grade reflected their performance and two others wanted to receive more personalized and specific feedback regarding their performance. Two participants liked that the quiz score calculated into their final grade. One participant reported that they had "not yet received" their "final grade" and thus they chose not to respond further to this question. Two others reported that grading was subjective, and another two participants had nothing specific to offer.

Summary of Students' Comments Regarding "did not like about current grading system"

Existing grading protocol—Five participants complained that the grading system was "subjective" and another stated that it was "unhelpful." Eight participants reported that the feedback they received failed to offer "constructive comments."

Revised grading protocol—Two participants shared that they had "no problem" with the grading system or that it was "fine." Another two exclaimed that there was a "lack of clarity" regarding what they were actually being graded on. Two participants reported that grading was arbitrary, another offered that it was "subjective." Eight individuals wanted "constructive feedback," and two others remarked that there was a lack of specific feedback. Another pair of participants suggested that midway through the rotation there should be a personalized discussion about individual student performance and guidance on how to improve performance. One participant reported that they had "not yet received" their "final grade" and thus they chose not to respond further to this question. Comments about dislikes were fairly similar across both groups of participants, suggesting that those issues present in the existing protocol survey were unchanged even when the revised protocol was implemented.

DISCUSSION

The evaluation of veterinary students on a clinical clerkship can be challenging for the evaluators. In the present study, we reported that evaluators believed that the revised grading protocol was fairer, more representative, and provided more appropriate feedback for students after making relatively simple changes to the existing protocol. Students' feedback was similar for both protocols in terms of what they disliked; in general, students asked for more feedback, and feedback that was specific and timely, in addition to their concerns about the grading protocol used. Although changes made to the grading protocol were driven by concerns of the evaluators, students' feedback was similar between grading protocols.

There are several important objectives for evaluating veterinary students on clinical clerkships: the first is to ensure that students have met predefined knowledge and skills criteria required for competency; the second objective is to discriminate between individual students for purposes of students' applications for internships, residencies, and other jobs; a third objective is to provide students with constructive feedback so that they can make improvements.

Grade inflation is a significant concern in human medical student training[5,6] and limited evidence suggests this may be true in veterinary medicine as well.[7] Some evidence in human medical training suggests that the type of grading scale used may contribute to inflation, although there are conflicting reports on *how* they might contribute to inflation.[5,8] Although there is desire for consistent clerkship grading scales used within and across medical institutions[8], there is still significant variability. Although similar studies surveying clerkship grading in veterinary medicine do not exist, it is reasonable to expect that there is similar variability. Our study did not specifically address grade inflation, however improved consistency with grades may be one way to try to avoid grade inflation.

While assessment tools for veterinary student evaluation should be valid and reliable, these tools must also be feasible and practical in order for evaluators to adopt them.[9] Instructors in the present study found value in the changes made to the grading protocol, improving the face validity of the protocol. Students found both protocols to be acceptable. Additional studies are required to further test the protocol's validity as well as its reliability. One of the improvements made in the adjusted protocol was the use of an online system that invited all evaluators to submit their feedback. In the existing process, if evaluators did not attend the meeting, then they missed the opportunity to offer feedback. From the standpoint of being inclusive the adjusted protocol was helpful in acquiring a more comprehensive set of evaluations from faculty and staff. This process had at least three important benefits. First, it ensured that all evaluators had a voice in assessing student clerkship performance. Second, it has the potential of providing clerkship students with a more representative view of their performance across evaluators. Finally, this process helped to ensure that each evaluator's voice was equally weighted in the final grade calculation.

There are several important limitations of the present study. Evaluators were aware of the intention for the protocol changes to "improve" the grading system by the authors. Although surveys were anonymous, there may have been bias in favor of the adjusted protocol by the evaluators. The majority of respondents to the evaluator survey were clinicians, with a relatively small portion of technical staff responding. Historically, technicians have been less involved in the grading process of the ECC clerkship at our institution, which may have led to the reduced participation from this group.

There were different students responding to the survey for the existing protocol evaluation as well as for the adjusted protocol, making direct comparison difficult. Despite this, student responses for the open-ended questions were similar. The addition of new staff (one faculty member and several technicians) occurred during the study period and could have had an effect on results. No other major changes to the clerkship occurred during the study period. There is also the potential for differences in responses from student depending on which clinicians they were working with. Students will generally work closely with two or three (of nine) residents and interns and one or two (of seven) faculty members during a two week rotation, meaning any one student did not work at all with a large portion of clinicians on the service.

Students' desire for more and more timely feedback is consistent with previous reports.[4,10] Although the category descriptions were written in an effort to be more specific and thorough, students in both groups requested more feedback. A few students did report that feedback received during the clerkship was helpful, however this was neither formal nor part of the grading protocol. Additional studies are needed to evaluate methods for improving student feedback and the effect on students' perceptions of their evaluation. The changes made to the grading protocol were prompted by informal concerns from the faculty; before this study students had not been specifically asked about the grading system, and their feedback was not used in the revision. Further studies

need to be conducted to address their concerns regarding feedback.

We do not know how satisfied veterinary medical educators in general are with the current grading protocols used. Dissatisfaction with grading protocols is reported to be fairly common among human medical and surgical clerkship directors.[11,12] While we did not specifically ask respondents if they were satisfied with either grading scale used during this study, we did demonstrate increased agreement with many factors that would be expected to be associated with satisfaction with the new protocol, such as that the scale is fair and representative. Additional evaluation of our revised protocol could include a comparison of students' grades on the ECC clerkship with those same students' grades on other clerkships (or preclinical grades) to see how our scale relates to other measures of students' performances. Further, individual scores could be compared between evaluators on the ECC service to determine if the internal structure of our protocol performs well.

Ideally, veterinary medical schools should work toward creating consistent, transparent, valid, and reliable grading protocols that could be used across all training programs. In the absence of universal grading scales, clerkship directors should consider evaluating current grading protocols and if general dissatisfaction is identified (either formally or informally), they should consider making changes that could lead to improvements in grader and student satisfaction with the grading process.

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APPENDIX 1

Original Grading Scale Used (where 1 = *needs remediation*, 2 = *competent*, 3 = *good*, and 4 = *exemplary*)

History, Physical Examination, Differential Diagnoses and Problem List

1. Unable to perform accurate and complete histories without frequent omissions. Examinations incomplete or findings misinterpreted. Unable to effectively identify and/or prioritize important problems.
2. Performs histories and examinations satisfactorily. Occasional omissions or inaccuracies; but generates acceptable list of differential diagnoses and is generally well organized. Generally prioritizes problems correctly.
3. Almost always identifies and characterizes historical information accurately. Recognizes and addresses physical examination subtleties at a good level. Consistently generates the most common differential diagnoses. Often prioritizes problems into categories of high-yield and low-yield problems.
4. Takes thorough and well-organized histories. Performs accurate and complete examinations in a timely manner. Able to elaborate key physical examination findings and associated subtleties. Provides a comprehensive list of differential diagnoses. Consistently prioritizes problems into clear categories of high-yield and low-yield problems.

Case Analysis, Diagnostic/Therapeutic Plan, and Understanding of Emergency & Critical Care Approach

1. Has problems selecting appropriate diagnostic tests and justifying. Weak ability to analyze diagnostic test results. Has some problem defining prognoses.
2. Usually suggests important diagnostic tests and correctly justifies selection. Usually evaluates test results well. Prognoses generally accurate.
3. Demonstrates above average abilities to select key diagnostic tests and to justify those selections for emergency and critical care patients. Interprets test results with good skill and defines good diagnostic plans for the patients.
4. Consistently identifies key diagnostic tests and correctly justifies selection. Accurately interprets test results. Analyzes data and makes excellent decisions. Can give accurate prognoses for a wide spectrum of critical care related diseases.

Knowledge Base, Application of Knowledge, and Clinical Thinking Skills

1. Limited knowledge in most subject areas. Deficiencies identified that hinder progress through cases. Illogical and/or scattered clinical thought processes.
2. Satisfactory knowledge base in most subject areas but little knowledge in critical care and emergency cases. Logical clinical thought processes displayed, but occasional errors noted.
3. Displays good knowledge and understanding of a variety of common and complex critical care problems. Ability to solve clinical problems for specific patients is above average.
4. Displays superior knowledge (pathophysiology, cardiovascular, pharmacology, medicine, surgery, anatomy) on own cases, as well as cases of others. Clinical thought processes are consistently logical and complete.

Technical Skills

1. Unable to perform some essential components of basic clinical procedures (catheter placement, drug calculations, basic surgical procedures). Poorly organized and lacks knowledge about procedures.
2. Satisfactory skills for basic clinical procedures. Acceptable knowledge of critical care monitoring, catheter placements, and nursing.
3. Shows above average skill in critical care monitoring. Basic wound care and basic surgery skills. Good knowledge of procedures and required materials before beginning task.
4. Performs both critical care monitoring, emergency surgery procedures, wound care, and patient care exceptionally well. Exceptional knowledge of procedures and required materials before beginning task.

Record Keeping, Discharge Instructions, SOAPs, and Non-Standard Procedures

1. Correct format usually not followed. Problems and assessments often inaccurate. Often omissions and/or completed late.
2. Records and/or reports follow correct format, problem identification, and assessment often correct. Usually completed on time.
3. Records and/or reports follow correct format and contain all pertinent entries. Problem identification and assessment considered strong.
4. Problem oriented medical records and/or procedural reports are concise, accurate, and always completed on time. Reports are easy to read and provide clear case documentation.

Patient Care and Follow-Up

1. Optimal patient care often delayed or overlooked. Potential for significant compromise of patient's health.
2. Conscientious regarding patient care and treatment. Occasional errors made, but promptly corrected when directed.
3. Patient care is above average and always completed on time. Shows genuine interest in case outcome.
4. Patients receive exceptionally high quality care and treatments in a timely manner. Concerned for the welfare of patients. Maintains a high interest in patient status/condition following discharges and ensures proper follow-up.

Client and/or Professional Communication and Teamwork

1. Rarely communicates or articulates ideas effectively. Has problems communicating information clearly. Has problems with appropriate use of medical terminology and explaining concepts. Interpersonal skills need improvement.
2. Reasonably good at establishing rapport and communicating with clients, peers, staff, and faculty. Uses appropriate medical terminology and concepts.
3. Demonstrates above average communication skills. Uses appropriate medical terminology and concepts well. Good interpersonal skills with clients, peers, staff, and faculty. Offers to help fellow students with cases.
4. Communicates and articulates exceptionally well. Is fluent and accurate in medical terminology and clearly conveys concepts. Listens effectively. Strong interpersonal skills. Is proactive to help fellow students and goes above and beyond expected duties.

Participation in Clinical Rounds

1. The student demonstrates one or more of the following: insufficient ability to analyze patient database or integrate relevant basic and clinical scientific knowledge. Significant difficulty in discerning the forest from the trees. Difficulty in elaborating a core differential diagnosis, prioritizing patient problems, or developing diagnostic and therapeutic approaches, even with directive questioning. May show minimal participation and/or often arrive late.
2. Usually demonstrates an adequate analysis of patient database and integration of relevant basic and clinical scientific knowledge. Occasionally has difficulty discerning the forest for the trees. Able to define a core differential diagnosis and a reasonable plan of care. Participates in rounds with accurate responses on most occasions.
3. Consistently reasonable analysis of patient database, succinct and accurate integration of relevant basic and clinical scientific knowledge and clinical judgment. Able to elaborate a reasonable differential diagnosis and define logical diagnostic and therapeutic approaches. See the big picture and focuses on what is important.
4. Often demonstrates insightful analysis of information and/or insightful approach to diagnosis and treatment. Able to apply basic science knowledge to clinical situations. Accurately interprets and weighs conflicting information. Actively participates in discussions. Presents cases clearly, concisely and accurately. Always on time.

Attitude, Effort, Independent Research, and Professionalism

1. A small degree of effort maintained. Poor attitude often demonstrated. Honesty, respectfulness, selflessness, willingness to concede mistakes or attitudes toward peers, staff, or faculty is sometimes a cause for concern. At times inappropriate behavior or interactions.
2. Satisfactory level of effort usually given. Generally has positive attitude. Behavior and interactions appropriate but rarely outstanding. Open to feedback but does not overly welcome it.
3. Attitude, effort, behavior and interactions are always appropriate and occasionally outstanding. Consistently mature, honest, and respectful. Knows when to seek advice. Compassionate in interactions with patient, peers, staff, and faculty. Strong work ethic. Researches cases independently. Welcomes feedback.
4. Good attitude and high degree of effort always evident. Behavior and interactions are consistently outstanding. Overtly demonstrates maturity, honesty, and respect in interactions with peers, staff, and faculty. Actively seeks feedback. Exceeds expectations for researching cases independently.

APPENDIX 2

Portion of the Revised Grading Used (where 1 = *needs remediation*, 2 = *competent*, 3 = *good*, and 4 = *exemplary*)

Emergency History-Taking Skills

1. Unable to perform accurate and complete histories without frequent omissions. Takes extended amount of time and unable to obtain necessary information.
2. Performs histories satisfactorily. Pertinent follow-up questions generally not asked.
3. Almost always identifies and characterizes historical information accurately. Asks follow-up questions appropriate for the case (e.g., asks about possible toxins or foreign bodies for a case of vomiting).
4. Takes thorough and well-organized histories in a timely, efficient manner. Is able to elicit subtle information from clients quickly and under stress.

Emergency Physical Examination Skills & Triage Skills

1. Examinations incomplete or findings misinterpreted. Physical examination frequently not performed without prompting. Is unable to recognize signs of shock or distress quickly and prioritize physical examination findings. Has difficulty triaging/prioritizing the sickest patients from the stable patients.
2. Physical examination is generally complete, though occasional findings are missed. May focus on less important findings that are not critical to the urgent problem at hand (e.g., focuses on dental disease in a patient with respiratory distress). Able to identify patients in shock or severe distress.
3. Quickly identifies and localizes critical problems. Is able to prioritize physical examination findings and triage patients appropriately. May occasionally miss subtle physical exam findings (e.g., quiet heart murmur, abdominal mass).

4. Physical examinations are efficient, accurate, and complete. Subtle findings are usually found. Able to quickly identify life-threatening problems and localize them correctly. Able to prioritize critical patients over stable patients.

Emergency Differential Diagnoses and Problem List

1. Unable to effectively identify and/or prioritize important problems. Problem list is usually incomplete or incorrect. Rarely able to create an appropriate differential diagnosis list, or is frequently incorrect.
2. Occasional omissions or inaccuracies; but generates acceptable list of differential diagnoses and is generally well organized. Generally prioritizes problems correctly.
3. Consistently generates the most common differential diagnoses for emergency patients. Often prioritizes problems into categories of high-yield and low-yield problems. Is able to group problems effectively to yield more concise differentials list. Sometimes prodding or guidance is needed for a complete list.
4. Provides a comprehensive list of differential diagnoses with minimal guidance. Consistently prioritizes problems into clear categories of high-yield and low-yield problems.

Emergency Case Analysis, Diagnostic/ Therapeutic Plan, and Understanding of Emergency & Critical Care Approach

1. Has problems selecting appropriate diagnostic tests and justifying; frequently tests are inappropriate or unnecessary. Weak ability to analyze diagnostic test results; makes frequent misinterpretations or misses important abnormalities. Unable to utilize test results to guide a therapeutic plan. Unable to provide a reasonable prognosis.
2. Sometimes suggests important diagnostic tests and correctly justifies selection based on differential diagnoses. Sometimes tests are suggested based on routine and are not appropriate for the case at hand (e.g., suggesting complete blood count [CBC], chemistry panel [Chem], and urinalysis [UA] for all cases regardless of need or time frame). Usually evaluates test results correctly, but sometimes important findings are overlooked or misinterpreted. Test results are not always used to create the therapeutic plan. Prognoses generally appropriate.
3. Often able to select key diagnostic tests and to justify those selections for emergency and critical care patients based on the differential diagnoses. Interprets test results correctly most of the time with infrequent omissions. Therapeutic plan is reflective of the case analysis and test results.
4. Consistently identifies key diagnostic tests and correctly justifies selection based on the differential diagnoses. Accurately interprets test results. Analyzes data and makes appropriate treatment decisions. Can give accurate prognoses for a wide spectrum of critical care related diseases.

Knowledge Base

1. Limited knowledge in most subject areas. Deficiencies identified that hinder progress through cases.
2. Satisfactory knowledge base in most subject areas but little knowledge in critical care and emergency cases.
3. Displays good knowledge and understanding of a variety of common and complex critical care problems.
4. Displays superior knowledge (pathophysiology, cardiovascular, pharmacology, medicine, surgery, anatomy) of critical care cases and diseases.

Application of Knowledge and Clinical Thinking Skills and Independent Research

1. Illogical and/or scattered clinical thought processes. Unable to use the information at hand to think through a case and make assessments. Does not look up problems when assigned. Poor performance on the assigned quiz ($<70\%$)
2. Logical clinical thought processes displayed, but occasional errors noted. Needs significant guidance to think through a case and determine the pertinent problems. When asked, will research a problem, but frequently information is still incomplete or sources inappropriate. Adequate performance on the quiz ($>70\%$ and $<80\%$).
3. Ability to solve clinical problems for specific patients is above average. Occasional guidance is needed to identify important issues. Thoroughly researches questions when asked using appropriate and multiple resources. Strong performance on the quiz ($>80\%$).
4 Clinical thought processes are consistently logical and complete. Minimal guidance is needed to think through a case logically and accurately. Researches important questions without prompting using appropriate resources. Outstanding performance on the quiz ($>90\%$).

Technical Skills

1. Unable to perform some essential components of basic clinical procedures (catheter placement, drug calculations, basic surgical procedures). Poorly organized and lacks knowledge about procedures.
2. Satisfactory skills for basic clinical procedures. Acceptable knowledge of critical care monitoring, catheter placements and nursing.
3. Shows above average skill in critical care monitoring. Basic wound care and basic surgery skills are strong. Good knowledge of procedures and required materials before beginning task.
4. Performs both critical care monitoring, emergency surgery procedures, wound care and patient care exceptionally well. Exceptional knowledge of procedures and required materials before beginning task.

Records Keeping (Discharge Instructions)

1. Correct format usually not followed. Paperwork does not reflect the discussion with the attending clinician. Paperwork is often incomplete or not completed on time.

2. Records and/or reports follow correct format, and reflect the problems and plans discusses. Usually completed on time.
3. Records and/or reports follow correct format and contain all pertinent entries. Always completed on time.
4. Problem oriented medical records and/or procedural reports are concise, accurate, and always completed on time. Reports are easy to read and provide clear case documentation.

Patient Care and Follow-Up
1. Optimal patient care often delayed or overlooked. Potential for significant compromise of patient's health.
2. Conscientious regarding patient care and treatment. Occasional errors made, but promptly corrected when directed.
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This ahead of print version may differ slightly from the final published version.