# UC Irvine

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Effectiveness of Case-Based Learning Versus Traditional Models on Knowledge Retention

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**Curricular Design:** Two, 2 hour SASs were held in August. Advisees completed a pre-session form and met for 8 minutes with up to 7 EM education faculty in proximal private offices to facilitate rotation. Students and faculty were surveyed regarding the format. Institutional Review Board exemption was granted.

**Impact/Effectiveness:** Of 26 students pursuing EM, 23 (89%) participated in the SAS. The post-session survey was completed by 74% of students (17 of 23) and 100% of faculty (7 of 7).

Students met with an average of 6.25 faculty and over half were new to the students. All students found the SAS to be informative, an efficient use of time, and helpful to meet multiple faculty. Almost all found it to be fair and objective (94%) and were comfortable asking personal questions (88%). Students desired longer time intervals with each faculty (71%), but 77% felt their questions were answered adequately. Common discussion topics included: to which programs and how many to apply, likelihood of matching in EM, standardized letters, grades, United States Medical Licensing Examination scores, and career goals. Faculty reported no prior interaction with 60% of advisees. Fewer faculty than students preferred longer time intervals (43% vs. 71%) and 86% preferred speed-advising to traditional meetings. Though optimal structure and time allotment should continue to be explored, speed-advising allows students efficient interaction with multiple EM educators while addressing individual concerns about matching in EM.

## 17 Does the Extent of Medical Student Reflection Correlate with their Grade in an Emergency Medicine Clerkship?

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**Introduction:** Many medical schools have begun to incorporate self-reflection exercises into their curricula. It is thought that these exercises help build a deeper understanding of material, and better academic performance. Students in clerkships are often reflect upon their performance but it is unclear if the exercise leads to better academic performance.

**Objectives:** The goal of this study was to evaluate the reflection of students in a one month emergency medicine (EM) clerkship to determine if there was a correlation between the degree of reflection and their final grade.

**Methods:** We conducted a retrospective case series, analyzing the performance and reflective statements of 116 students who participated in an EM clerkship at two clinical sites from 2013-2014. After each shift, an attending EM physician evaluated the student and the student could complete an optional reflection section, which was free text. We analyzed the correlation between the final grade, expressed in quartiles, and the degree to which the student completed the reflection using the Freeman-Halton extension of Fisher's exact test. A linguistic analysis was also performed to analyze the choice of words in the students reflection.

**Results:** Of the 145 possible records, 116 were included for analysis. The other 29 were excluded as they were visiting students. Two EM physicians graded the rate of completion of the self-reflection, demonstrating moderate agreement in their assessment (Cohen's kappa=0.55). The assessments of both raters were significantly correlated with final grade (p=0.006 and p=0.008). A linguistic analysis showed that the students with the lowest grades in the course wrote the least amount of reflection.

**Conclusions:** There is a correlation between the degree and quality of reflection with final grade in an EM clerkship. In future, as faculty preform the evaluations, they can encourage more insightful reflection from the students to improve their performance in the clerkship.

## 18 Effectiveness of Case-Based Learning Versus Traditional Models on Knowledge Retention

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**Introduction/Background:** Recent course evaluations from medical students and residents have demonstrated the need for medical education evolution; specifically decreasing lecture time while increasing the opportunities for the interactive case-based learning module. The objective of this project was to assess the quantitative impact on knowledge retention conferred by two different styles of medical education presentation; traditional vs. case-based learning.

**Educational Objectives:** We sought to quantify the effect of two instructional modalities, power point lectures (PPT) vs. case-based learning (CBL) modules on:
1) Initial knowledge gained (as measured by same-day pre- and post-curriculum knowledge assessments)
2) Knowledge retention (as measured by a post-curriculum exam given at 2 weeks)

**Curricular Design:** At the start of every Emergency Medicine (EM) block, an EM topic is presented to third year medical students during their orientation. For this project, we selected "An Introduction to Electrocardiography (ECGs)" (e.g., atrial fibrillation, ST segment elevation, tricyclic antidepressant toxicity overdose, Brugada). Every student took a fifteen question pre- and post-curriculum exam to assess their knowledge of ECGs. After two weeks, the students were asked to re-take this exam which sought to assess their ECG knowledge retention stratified by learning module. To date, we have collected data on 60 students.

**Impact/Effectiveness:** The mean positive change in pre- and post-curriculum test scores were comparable between students who received their instruction via traditional lecture vs. CBL (21%, 18%, respectively). As expected both groups experienced a loss on knowledge retention (e.g., a

negative mean change in test scores). However, this loss of knowledge retention was less among case-based learners vs. the traditional learners (1%, 7%, respectively, p=0.18).

Future directions include effect of the learners' curriculum satisfaction on knowledge retention.

## 19 Efficacy of iPad iTunes U Electronic Curriculum in Emergency Medicine Education

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**Background:** Recent theories suggest that adult learners respond better to self-directed learning over formalized learning processes. Additionally, Accreditation Council for Graduate Medical Education and the Residency Review Committee now allow 20% of required educational time to be done as "distance learning." The UC Irvine emergency medicine (EM) Residency Program implemented a distance-learning curriculum; it is iPad based and includes four modules per month.

**Objectives:** The primary outcome was improvement of In-Training exam scores. Our statistical goal was to compare the In-Training Exam Scores of those who consistently complete the iPad curriculum (defined by completion of >75% of modules) to those who did not. We hypothesized that those residents that more consistently completed the monthly modules would have increased In-Training Exam scores compared to those residents that do not.

**Methods:** The study was a prospective cohort study aimed to measure efficacy of the iPad curriculum. We analyzed the module, test and survey data from the 18 UCI EM Residents during 2013-2014.

**Results:** The statistical analysis involved a 2-sample t-test comparing those that completed 75% or more of the modules to those that completed less than 75% of the modules. The residents that completed 75% or more scored 2.2 points higher on the EM In-Training exam, however the difference was not significant (p=0.48).

**Conclusion:** Although we did see a slight improvement in residents who completed greater than 75% of the iPad modules the results were not statistically significant. Unfortunately, due to residency size we had a small sample size. The study was also limited by multiple confounding variables, including home studying methods, other changes to the UCI EM Curriculum, and resident lecture attendance. Overall the UCI EM Residents had positive comments about the iPad curriculum, and we will use the results of this study to help further shape the 2014-2015 iPad curriculum to be educationally beneficial and to expand this study with additional data points.

## 20 EM-Bound Medical Student Exam Performance on the EM-Advanced Clinical Examination (EM-ACE) and Versions 1 and 2 of the National EM M4 Exams

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**Background:** In April 2013, the National Board of Medical Examiners (NBME) offered an Advanced Clinical Examination (ACE) in emergency medicine (EM). In addition to this, the Clerkship Directors in Emergency Medicine (CDEM), have provided two (Versions 1 and 2), online high-quality, internally validated exams. While national usage statistics, including performance averages, are available for all 3 exams, it is unknown how career-bound EM students (i.e. those who match into EM) perform on the exams as compared to the entire national cohort. Interpretation of exam scores of EM-bound students may need to be adjusted if performance on national exams differs between EM- and non-EM-bound students. This study compares performance of students who matched into an EM residency in 2014 to students who did not on the EM-ACE and Version 1 (V1) and Version 2 (V2) of the National M4 EM exams.

**Methods:** In this retrospective multi-institutional cohort study, the EM-ACE and either V1 or V2 of the EM M4 exam was given to students taking a 4th year EM rotation at 3 institutions from April 2013 to February 2014. Exam performance, including the scaled EM-ACE score, percent correct on the EM M4 exams, and whether the student matched in EM in the 2014 National Resident Matching Program Match were collected. Students' t-tests were performed on the exam averages of students who matched in EM as compared with those who did not.

**Results:** 132 students from 3 institutions took the EM-ACE and one of the EM M4 exams. 35 students matched in EM in the 2014 Match. The mean score for EM-bound students on the EM-ACE, V1 and V2 of the EM M4 exams were 70.5, 84.9, and 83.3, respectively. Mean scores for non-EM-bound students were 68.0, 83.5, and 74.5. There was a difference in mean scores for V2 of the EM M4 exam only.

**Discussion:** In conclusion, there was no significant difference between performances comparing those who matched into an EM residency to those that did not on the EM-ACE or V1 of the EM M4, but there was in V2 scores for EM-bound and non-EM-bound students.