Title: A Core Entrustable Professional Activity: Maintain professional resiliency & practice of stress management skills

Submission Type: Innovation Highlights in Medical Education

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Submitting Author Institution: University of Illinois- Urbana-Champaign

Purpose: The Entrustable Practice Activities (EPAs) published by the Association of American Medical Colleges (AAMC) are forming the foundation of competency based assessment in undergraduate medical Education (UME). Currently, the core EPAs leave out the competencies that capture student wellness. Without these competencies, student wellness will be left out of curriculum development and ignored as a fundamental skill in the development of a competent, honest, reliable and healthy physician workforce. These skills are especially important during the clinical years, when undergraduate medical students report the highest rates of stress and a decrease in empathy. We developed a core EPA to include these wellness competencies and also propose new competencies for the Physician Competency Reference Set that aim to prevent physician burnout.

Approach/Methods: Focus groups including undergraduate medical students, residents, clinical faculty, wellness promotion specialists, stress management coordinators, social workers, clinical counselors, and mental health specialists met to discuss the development of a 14th core EPA that would encompass student wellness.

Results/Outcomes: The focus groups composed a 14th core EPA: Maintain professional resiliency and practice of stress management skills. This EPA includes 3 existing competencies and 5 newly proposed competencies, which were argued to better prevent burnout and establish wellness, rather than identifying only the late signs of burnout. The competencies include: Articulate the definition of health (Knowledge for Practice (KP) 7*), Demonstrate healthy coping mechanisms to respond to stress (Personal and Professional Development (PPD) 2), Identify signs of burnout, fatigue, substance abuse, sleep deprivation, and depression in self and colleagues (Professionalism (P) 7*), Ask for personal assistance when needed (PPD1), Encourage an environment of collaboration and learning (PPD9*), Identify appropriate local resources available to foster all dimensions of their patients' health (KP8*), Manage conflict between personal and professional responsibilities (PPD3), Articulate what gives life and the profession meaning (P8*). New competencies are marked by an asterisk.

Discussion: The burnout rate of physicians is reported as high as 50%2 and leads to decreased quality of care, increased medical errors, decreased patient satisfaction, decreased productivity and professionalism, high physician turnover, broken personal relationships, substance abuse, depression, and suicide.2-4 The current EPAs do not address physician wellness and leave out key competencies that measure late signs of burnout and fatigue. Furthermore, the current medical competencies do not address the ability to prevent burnout. This proposed EPA aims to ensure students are able to maintain their own personal wellness and encourages this behavior in their patients through direct referrals to local resources. Institutional support from AAMC, the Liaison Committee on Medical Education and individual medical schools is critical to make desperately needed changes in UME; otherwise these skills
will continue to be the lowest priority in the majority of UME settings. With the addition of this 14th EPA, the EPAs will not only prepare the learner to be successful on day one of residency, but throughout their medical careers.

**Significance:** This student led initiative is the first attempt to create systematic and institutional change in the curriculum of the EPAs to support student wellbeing.
Title: A Prognostic Index for Developing Depression in Medical Students Derived from A National, 4 Year Longitudinal Study

Submission Type: Research Highlights in Medical Education

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Purpose: The prevalence of depression among medical students is 27%.(1) Beyond the associated individual suffering, depression can lead to declines in academic performance, thoughts of dropping out of medical school, and suicide.(2-4) Although medical schools must have a student wellness program available for all students,(5) a targeted approach that provides additional support to students at highest risk for developing depression may be useful. Our aim was to develop a prognostic index that stratified the risk of developing depression (Depression-PI) based on factors that are readily available or obtainable by medical schools and non-threatening to students.

Approach/Methods: Data from 3743/4732 (79%) students attending 49 US medical schools and who completed baseline (2010) and year four (2014) surveys were analyzed. Surveys included validated scales to measure depression, stress, coping, and social support. Demographic information and school characteristics were also collected. We conducted multivariate analysis to identify year 1 factors independently associated with depression in year 4, and verified using bootstrapping techniques. These factors were used to create a prognostic index for developing depression. The dataset was randomly divided into discovery (n=2455) and replication (n=1288) datasets to evaluate the Depression-PI, and the C-statistic was used to assess validity and reproducibility. The study was IRB approved.

Results/Outcomes: Factors independently associated with year 4 depression included non-white race (OR 1.42, 95%CI 1.14-1.75), not Hispanic/Latino (OR 1.72, 95%CI 1.12-2.64), non-US born (OR 1.39, 95% CI 1.06-1.82), and middle tertile tuition (OR 1.26, 95%CI 1.03-1.54). High stress (OR 2.33, 95 CI 1.91-2.85), high negative coping (OR 1.98, 95%CI 1.63-2.41), and low social support (OR 1.76, 95%CI 1.43-2.17) at baseline were also independent predictors of depression at year 4. The Depression-PI separated four risk groups. In comparison to the low risk group, those in the intermediate, high, and very high risk group had an odds ratio of 1.83, 3.47, and 6.7 of developing depression (c = 0.65). The risk groups were confirmed in the replication dataset.

Discussion: Demographics, social support, coping behaviors and tuition cost are independently associated with the risk of developing depression among US medical students. By segregating students into four risk groups the Depression-PI may allow for a targeted primary prevention approach for those students with highest risk for developing depression.

Significance: No previous study has explored the relationship of individual medical student characteristics at the time of matriculation or medical school factors with the risk of developing depression by the end of medical school. The Depression-PI has the potential to support medical school efforts to promote student wellness. Groups of students at low risk for year 4 depression may not need assistance beyond that offered by generic wellness program. Groups of students in the intermediate
risk group may benefit from added support, whereas groups of students in the high risk groups may warrant allocation of further resources including individualized support, active screening, and early intervention. How best to engage students in a tailored primary prevention strategy and whether doing so leads to less suffering and depression and fewer adverse consequences warrants study.
Title: Comparison of faculty and resident physician burnout across one academic medical center

Submission Type: Research Highlights in Medical Education

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Submitting Author Institution: University of Alabama at Birmingham School of Medicine

Purpose: Burnout is prevalent in physicians-in-training as well as those in practice, which may be related to long work hours, work volume, and sleep deprivation, among others. Burnout rates remain alarming because of their links to decreased productivity, lower quality of care, early retirement, and depression. Prior studies have focused on rates of burnout among physicians in one specialty or at one phase of the continuum of practice. This study aims to compare the prevalence of burnout among residents and faculty physicians from all specialties at one institution.

Approach/Methods: The emotional exhaustion question as part of the single-item Maslach Burnout Inventory was embedded in the University of Alabama at Birmingham (UAB) Graduate Medical Education Work Environment Survey and the UAB Faculty Engagement Survey. All residents and faculty at the institution were invited to participate in their respective electronic survey between January and April 2017. All data were reported by training program or work unit for confidentiality, and were included only if 5 or more individuals responded. Due to survey administration constraints, the faculty item was collected using a 5-point scale and subsequently adjusted to a 7-point Likert Scale for comparative analysis using paired t-tests. High burnout was defined as a score of 5 or greater.

Results/Outcomes: Survey responses were recorded from 778 residents and 1761 faculty members from all clinical programs and departments (79% and 56% response, respectively). Of the 25 specialties represented, two faculty (Anesthesiology-Pain Management [5.6] and Neuroradiology [5.32]) and two resident (Pediatric Hematology/Oncology [5.5] and Otolaryngology [5.0]) groups had mean scores qualifying as high burnout. Sixteen specialties had significantly higher burnout scores among faculty as compared to residents (p<0.05 for all), but Pediatric Hematology/Oncology and Pediatric Surgery had significantly lower burnout scores among faculty compared to residents (5.5 vs 4.2 and 4.5 vs 2.8, respectively, p<0.01 for both). In groups of medical, surgical, and hospital-based specialties, faculty had significantly higher burnout scores than residents in the corresponding group (3.97 vs 3.57 medical, 4.28 vs 3.43 surgical, 4.27 vs 3.78 hospital, respectively, p<0.001 for all). Surgical and hospital-based specialty faculty had significantly higher burnout scores than medical specialty faculty, but these differences were not observed among the same resident groups.

Discussion: In this study, reported burnout scores for faculty physicians were equivalent to or higher than the corresponding resident physicians in each group except for two pediatric sub-specialties. No significant differences were identified by medical, surgical, and hospital-based specialties although faculty continued to have higher burnout scores than residents. Further study is needed to determine the drivers of higher burnout scores among faculty physicians, particularly those in surgical and hospital-based specialties, so that focused interventions to optimize these physicians’ work environments can be undertaken.
**Significance:** Our results provide insight into the cross-sectional pattern of burnout scores among all residents and faculty at one academic institution rather than focusing only on specialty or level of training. These data suggest that an institution-wide approach is necessary to combat burnout, and a particular focus on faculty well-being is needed.
**Title:** Flexible Testing for Preclinical Medical Students and Well-Being  

**Submission Type:** Research Highlights in Medical Education  

**Submitting Author:** Laura Taylor, MD  

**Submitting Author Institution:** Michigan Medicine, University of Michigan  

**Purpose:** Medical student burnout is common and develops over the course of medical education.(1) Female students tend to have higher levels of personal distress in medical school.(2) Higher levels of medical student distress are associated with increased risks of suicidal ideation and medical school dropout.(3) There has been increasing interest in determining modifiable learning environment factors that may affect medical student well-being. Medical students who attend schools using pass/fail grading have lower rates of burnout and stress than students with more traditional grading systems.(4) At our institution, students have flexible testing where they can take quizzes and examinations from Friday afternoon until Sunday night. The purpose of this study was to determine if medical student well-being and stress are associated with day of testing in a flexible testing model. We hypothesize that later testing is associated with increased distress in this cohort.  

**Approach/Methods:** Our study included a single cohort of M1 students in the 2016-2017 academic year. Students were surveyed at matriculation and the end of their M1 year (133/171 students, 78% response rate). Medical student well-being was measured using the Medical Student Well-Being Index (MSWBI), consisting of seven questions.(3) Stress was measured by the Perceived Stress Scale (PSS).(5) ANOVA testing was used to examine correlations between primary day of testing (Friday, Saturday, Sunday, or varied days), MCAT percentile, M1 cumulative test score average, well-being, and perceived stress.  

**Results/Outcomes:** Over 57% of M1 students were majority Sunday testers and 75% of these Sunday testers were women. MCAT percentile was significantly lower in Sunday testers vs. other days (P=0.01), and M1 cumulative test score average was lower in Sunday testers (P<0.00). End of year MSWBI scores were higher (more distress) in students who tested on Sunday (P<0.00), as were M1 end of year Perceived Stress Scale scores (P=0.02). Change in MSWBI and PSS scores from matriculation to end of M1 year were significantly increased (more distress) in Sunday testers as compared to all other testers combined (P<0.05 and P=0.01, respectively).  

**Discussion:** Flexible testing for preclinical medical students is one modifiable learning environment factor that may be adopted with the goal of improving medical student well-being, yet this approach has not been studied previously. Students who waited until Sunday to take their exams had lower test score averages, lower well-being, and higher perceived stress than their colleagues who took their tests on Friday, Saturday, or on variable days. It is unclear how lower test scores are related, as they may be a cause or effect of this increased distress. Further study is necessary to explore this relationship and to determine whether late testing leads to increased distress or whether it may be a behavior of students who already have risk factors for burnout.
**Significance:** Exploration of the relationship between testing day and distress is important, as modifications of this learning environment factor may be one way to support medical student well-being or limit maladaptive behaviors in students at risk for burnout.