Teaching Health Policy and Economics in a Medical School Using a Simulation Game

Gwendolyn C. Morrison[1,2], Ph.D.;
Gene Beyt[3], M.D.;
Thomas Inui[2,4], M.D.;
Debra Litzelman[4], M.D.

[1]Indiana University-Purdue University Indianapolis; [2]Regenstrief Institute; [3]Tulane University, [4]Indiana University School of Medicine

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Jan. 5, 2:30 pm; AEA; Poster Session on Teaching Ideas and Projects

Location: Hilton Riverside

INTRODUCTION / BACKGROUND

The U.S. Medical Licensing Exam (USMLE) is comprised of two parts, each of which presently includes some behavioral and social science questions. The USMLE will be increasing the proportion of questions in this domain following a report of the Institute of Medicine which suggested that there is inadequate behavioral and social science content in medical school curricula generally [*IOM, Improving Medical Education: Enhancing the Behavioral and Social Science Content of Medical School Curricula, 2004*].

Averaging across the 9 campuses of the Indiana University Medical School (IUSM), from 1999-2003 inclusive, IUSM consistently scored higher than the national average on USMLE Step 1 (taken at the end of second year of medical school) overall, but consistently scored below the national average on the behavioral sciences questions

GOALS

To improve medical education in the behavioral and social sciences at IUSM, and to share teaching materials and findings with other medical schools through their inclusion in a national database, CurrMIT < http://www.aamc.org/meded/curric/ >, thereby contributing to the improvement of behavioral and social sciences teaching in medical schools generally.

CONTEXT

Health policy and economics was just one component of a larger curriculum development effort, “Indiana University Behavioral and Social Sciences Integrated Curriculum,” which addresses the following: Mind-Body Interactions in Health & Disease; Patient Behavior; Physician Role & Behavior; Physician-Patient Interactions; Social & Cultural Issues; and, Health Policy & Economics.

For Health Policy and Economics, this curriculum covered four topics that the IOM report had identified as important for inclusion in medical school curricula:

- The U.S. health care system
- The problem of uninsurance
- Cost & cost-effectiveness
- Geographic variation in health care utilization in the U.S.A.

TEACHING STRATEGIES

Research has not yet identified the best pedagogic method for teaching social sciences to medical students, however, research has shown that having a guest speaker lecture about health policy and economics for a couple of hours does not work. This project proposed using Team-Based Learning for the health policy and economics components [See Michaelsen et al, *Team-Based Learning: A transformative use of small groups in College Teaching* (Sterling VA: Stylus Publishing, 2004)].

Team-Based Learning used a mixture of teaching methods including a group based application exercise so students can "learn by doing" while still in a classroom setting. Students were assigned readings to do before class; the first 45 minutes of class was devoted to an application exercise which typically involves students splitting up information materials and then working together (pooling the information they had gathered) to complete the exercise. A discussion of key results from the application exercise and their implications for health and health care was followed by a mini-lecture (15-20 minutes). The topic of the class is taught mainly through these first three elements of the class.

In remaining class time, students answered a short multiple choice test (4-5 questions) which assessed their individual understanding of the material and, after turning in their answers, the students worked in their groups on the same set of questions. The individual test makes students accountable for doing the assigned readings, being involved in the application exercise, and paying attention in the mini-lecture. The group test further holds them accountable to their peers in terms of their ability to contribute to their group's discussions of the questions and answers. Furthermore, the grades of the individual and group test were used to demonstrate that everyone (or almost everyone) performs better when work as a team—an important lesson for first-year medical students who will need to work in teams throughout their careers. The class ended with a summary and discussion of key points for students to take away.

For topic number 4, "geographic variation in health care utilization," a scenario-based simulation board game was utilized. Clinical simulations have a long history in medical education (Bradley, *2006, Medical Education 40: 254-262),* and "managerial flight simulators" have been used effectively in management education. In addition, the use of scenario-based simulation in a clinical setting has been demonstrated (Kneebone *et al, 2005, Medical Education 39: 580-587)*; and recently, a novel approach to teaching teamwork using a business game simulation has been reported (Drake *et al, 2006, Teaching in Higher Education 11: 33-46)*.

SETTING & PARTICIPANTS

Students in their first and second years at Indiana University Medical School are based at one of nine campuses. In the pilot year (2006-2007), some of the new or revised components of the behavioral and social science integrated curriculum were introduced only at the Indianapolis campus, including the four sessions on Health Policy and Economics.

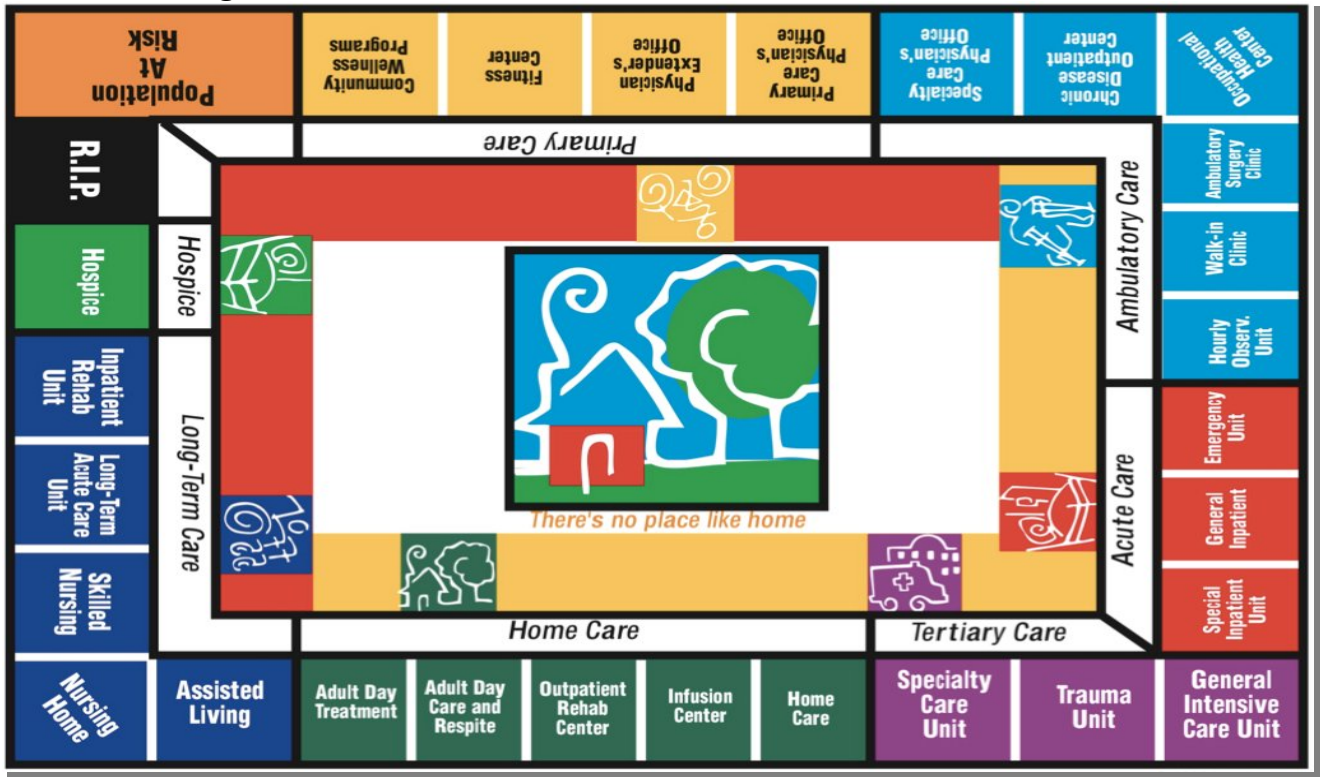
EXAMPLE APPLICATION EXERCISE:

Understanding Variations in Health Care

Context of Example

The intensity of health care utilization varies widely among geographic regions, even controlling for the severity of disease, without corresponding variations in health [Fisher *et al, 2003, Ann Intern Med 138:273-287*]. These variations can be reinforced by colleagues, by patients, and by fear of litigation (i.e., what is considered usual and prevailing practice locally).

The Care Management Game



We use a simulated environment based on this game board as the system of care, simulating three clinical events for one patient (a game figure) - a poorly controlled chronic disease, an acute potentially life-threatening event, and progressive end-stage debilitation - to illustrate the sources of, and magnitude of, health care cost variation. Each group of students is given one of four possible patient scenarios, and asked to decide which type of care to order for their patient

in each of the three events. The game figure is placed by the team's collective decision on the appropriate place on the game board as care is delivered. The four patient scenarios vary in terms of the patient's severity of illness (high or low) and local prevailing practice in terms of the intensity of health care utilization (high or low); see the table below. Students add up the health care costs that are initiated by their decision as their patient progresses through the health care system. The size of difference in the costs obtained by the groups assigned to each of the four scenarios were consistent with differences observed across regions of the U.S.A.: groups with the low severity and low utilization (low/low) scenario averaged $18,453; low/high = $41,240; high/low=$72,518; and, high/high=$137,162. By showing the health care costs resulting from the student teams' decisions, the game illustrates how much, and how little, control an individual physician may have on a patient's cost of care.

Event and Risk	Clinical Information	Diagnosis	Utilization Level
Event 1 High Risk	Gains 20 pounds, diabetes under poor control, begins to experience shortness of breath on exertion	Angina-equivalent, early congestive heart failure	*High Utilization*: Angioplasty *Low Utilization*: Ambulatory care
Event 1 Low Risk	Gains 20 pounds, diabetes under poor control, begins to experience shortness of breath on exertion	Physical de-conditioning	*High Utilization*: Specialty care *Low Utilization*: Primary care
Event 2 High Risk	Crushing chest pain lasting 60 minutes	Acute myocardial infarction (ST Elevation MI)	*High Utilization*: Angioplasty *Low Utilization*: Completed infarction
Event 2 Low Risk	Crushing chest pain lasting 60 minutes	Acute cholecystitis	*High Utilization*: In-patient surgery *Low Utilization*: Ambulatory care
Event 3 High Risk	Progressive signs and symptoms of congestive heart failure, incapacitation	End-stage cardiomyopathy (NYHA Class IV)	*High Utilization*: Biventricular pacemaker and inotropic infusion *Low Utilization*: Treatment for pulmonary edema episodes
Event 3 Low Risk	Progressive signs and symptoms of congestive heart failure, incapacitation	Chronic congestive heart failure (NYHA Class II)	*High Utilization*: Specialty heart failure program *Low Utilization*: Treatment for pulmonary edema episodes

LEARNING OUTCOMES

Students completed 15 questions from a test on health policy and economics that had been administered to a U.S. national sample of 1st year medical students (Agrawal *et al, 2005, Academic Medicine 80: 484-488*). Our students completed the test in their team based learning groups (10 groups of 7 or 8 students), while the national sample of students had completed the questions individually. Every question was answered correctly by a larger percentage of the IUSM student groups than by the national sample of 1st year medical students, with a mean point spread of 22.2% (std dev=21.3; Max=67%; Min=2%).

FUTURE ANALYSIS OF LEARNING OUTCOMES

We will use the 9-campus system as intervention and control groups, to compare the performance of students from the Indianapolis campus in the behavioral and social science questions of the USMLE-Step 1 (taken at the end of second year of medical studies) with that of students from the other 8 campuses.

Acknowledgements: *This work is funded by the NIH (award #5 K07 AR 053812- 03). Our thanks to Richard Boss, MD (Cardiac Assoc of New Hampshire, Dartmouth-Hitchcock Medical Center) for his help in determining the clinical care processes within the Care Management Game.*

References

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