An Interprofessional Simulation-Based Transition-to-Residency (TTR) Program

Research Highlights
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Purpose: Many In the evolution from medical school to internship, graduating students are expected to step seamlessly into their new roles with a markedly increased measure of autonomy and accountability. Current medical school boot camps feature a conventional mix of lectures, workshops, and simulation to prepare students for internship. The Transition-to-Residency course (TTR) at Weill Cornell features student-centered experiential learning activities integrated longitudinally around interprofessional teamwork, communication, patient care, resuscitation, cognitive and procedural skills to empower students as active agents in their own learning.

Methods: We designed and implemented a novel interprofessional, competency-based, simulation-driven course where students join nurses on interprofessional specialty-based teams according to future internships. Goals and learning objectives were developed by an interprofessional and interdisciplinary planning committee and features five core clinical topics by specialty: altered mental status, respiratory distress/failure, shock, abdominal pain, and chest pain. All objectives are linked to the 13 EPAs and 6 ACGME core competencies and milestones. One month prior to TTR, students complete pre-course educational modules created to help students review knowledge and reinforce core content fundamentals. Over the two week course of TTR, each specialty team manages multiple scenario-based, simulated patient encounters that create experiential learning opportunities to apply clinical reasoning and medical decision-making skills, reinforce teamwork behaviors, and practice basic procedural skills with immediate relevance to future internships. Each encounter focuses on the immediate first ten minutes of care before advanced help arrives, and may include patient care hand-offs, diagnosing and treating acute clinical conditions, managing unexpected on-call events, and specialty consultations. Interactive large and small group case and problem-based learning activities are interspersed between simulations to reinforce fundamental interdisciplinary specialty-specific clinical skills. Competency-based assessments of skills and teamwork, as well as self-assessments, were performed before and after TTR and analyzed using appropriate statistical methods.

Results: 58 medical students, 30 PA students, and 13 nurses participated in TTR 2018. In self-assessments of confidence focused on medical knowledge and clinical decision-making skills, medical students reported feeling significantly better prepared and more comfortable after TTR in the initial management of patients for all five core clinical topics (p<.0001). In competency-based assessments of medical knowledge and clinical decision-making skills using pre and post-test specialty-specific case-based exams linked to the EPAs and ACGME competencies, medical students demonstrated significantly improved performance after TTR in all five core clinical topics (p<.0001). In competency-based assessments of interprofessional teamwork skills before and after TTR evaluated by interprofessional TeamSTEPPS-trained raters, all student teams demonstrated significantly improved teamwork after training (p=.0002) and sustained improvement one week after the final simulation (p=.8588, suggesting skills preservation).

Discussion: These self and competency-based assessments correspond to Kirkpatricks reaction, learning, and behavior levels of evaluation. They demonstrate TTRs significant impact on the cultivation of medical knowledge, clinical decision making skills, and interprofessional teamwork skills among graduating students, consistent with the achievement of competencies in levels 1-3 of Millers Pyramid. The sustained improvements in teamwork further demonstrate how TTRs experiential learning model produced an actual behavior change in students, corresponding to
Millers level 4.

**Significance:** By focusing on competency-based education, TTR prepares students for a successful transition to residency. Working together in interprofessional specialty-specific teams, TTR's multi-modal learning strategies facilitate consolidation of knowledge and patient care skills in the context of management of multiple simulated patients. Each simulated patient encounter creates experiential opportunities to reinforce teamwork behaviors, rehearse medical decision-making skills, and practice basic procedural techniques. By applying knowledge and skills to complex problems with immediate relevance to their future internships, this experiential learning progression cultivates deeper learning and emphasizes higher-order thinking. Our study demonstrates that simulating patient-care demands and team-based challenges can dramatically improve clinical reasoning, medical decision-making, and interprofessional team performance.
Exploring Third-Year Medical Students' Professional Identity Formation Through Clinical Simulation

Research Highlights
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Purpose: Many Simulation is a valuable tool in clinical medical education. However, simulation may also be a valuable tool in promoting students professional identity formation (PIF) and feelings of patient ownership. There is currently no known research on PIF and patient ownership within a simulated clinical environment. The purpose of this study was to explore how simulation affects students’ PIF and experience of patient ownership.

The purpose of this study was to answer the following research questions:
RQ1: Does simulation affect the professional identity formation (PIF) and patient ownership of medical students?
RQ2: Does clerkship block affect the PIF and ownership experienced in by students in simulation?
RQ3: Does prior clinical experience affect the PIF and ownership experienced by students in simulation?

Methods: A mixed-methods study was conducted with third-year medical students who participated in an acute case simulation. A post-simulation survey instrument asked about the simulation experience, clerkship rotation, and prior clinical experience, and included open-ended prompts on PIF and patient ownership. Textual data were coded during latent content analysis and included individual element codes (IES) such as thinking like a doctor and contextual element codes (CES) such as material environment. A two-way MANOVA was performed to explore relationships between the independent variables of clerkship block and prior clinical experience, and the IES and CES dependent variables. Post-hoc analysis was conducted using two independent samples t-tests.

Results: Students who completed the in-patient clerkship block had significantly higher IES (2.65 + 0.897) compared to students who completed the out-patient clerkship block (2.18 + 0.727), p = 0.017. Students who did not have prior clinical experience before their clerkships had significantly higher IES (2.63 + 0.761) compared to students who did have prior clinical experience (2.14 + 0.932), p = 0.017.

Discussion: This study showed that simulation can promote students PIF and patient ownership, particularly in students who completed the in-patient clerkship block or lacked prior clinical experience.

Significance: Simulation can be intentionally designed to promote PIF and patient ownership and should be used more often and earlier in medical education.
Unprofessional Behavior during Standardized Patient Encounters A Teachable Moment about Boundary Violations

Research Highlights
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Purpose: Clinical encounters represent personal interactions between care provider and patient - ones which represent a substantial power differential. Such encounters include conversations and examinations that are deeply personal and depend on trust (1).

Inadvertent, insensitive words or actions can create anxiety, discomfort, alienation or anger in patients. When such words or actions represent boundary violations, a therapeutic relationship can be threatened. Crossing sexual boundaries are among the most egregious violations, but even this category can arise from seemingly minor, inadvertent or misinterpreted behaviors. Preparing learners to avoid boundary issues is an underemphasized component of medical education (2).

We report seven years of data on standardized patient (SP) reports of medical student words, actions and behaviors that provide teachable moments about events that may be interpreted as boundary violations.

Methods: At our institution, medical students participate in SP encounters throughout the curriculum. Collection of SP checklist-based data on medical interview, physical examination and interpersonal/communication skills is routine. Yet, like others, we discovered unprofessional behaviors often went uncaptured (3). Notes of Concern (NOC) were developed for SPs to complete when they had a professional concern about (a) something the student said (or did not say), (b) something the student did (or did not do), or (c) a personal characteristic, such as appearance or demeanor.

We reviewed each NOC and identified those in which the students behavior raised concerns of a boundary violation.

Results: During the study period (2010-2016) SPs submitted 171 NOCs with at least one behavior of a potential boundary violation. In all instances, the behavior described was brief, isolated, and believed by the SP to be inadvertent.

Something the student said (or did not say): 8 (4.7%) of NOCs
Ex: Referring to me as sweetie

Something the student did (or did not do): 100 (58.5%) of NOCs
Ex: Draping issues (37); inappropriate PE (29); unwelcome proximity/touching (23)

Personal characteristic: 63 (36.8%) of NOCs
Ex: Student clothing, such as plunging neckline or short skirt (57)

Response to NOCs has included review of the encounter (for context), formative student feedback, and course director discussion (for frequent/class-wide transgressions).

Discussion: While not always qualified to judge knowledge/skills, patients are ultimate judges of care-provider professional behavior. Since direct observation of learner-patient interactions occurs inconsistently, NOCs add value by providing a patients perspective on student professional
behavior during simulated clinical encounters - observations well within the scope of SP training. NOCs may be of particular value when students unintentionally violate social norms and remain unaware of how they are perceived until/unless they receive feedback.

While a universal definition of professional behavior remains elusive, it is important to anticipate how patients may interpret (or misinterpret) care-provider behaviors and develop a better understanding of why they occur (4). In our students, anxiety, naiveté about boundaries of a professional encounter, and a laser-focus on the mechanics of tasks contributed to lack of attention to simple but important behaviors.

All behaviors reported in this study were amenable to feedback to students on why the event might be considered unprofessional, and strategies to avoid future lapses. Due to their inadvertent nature, video review was essential in helping students recognize these behaviors.

Better use of these performance data can lead to more timely feedback to individual students about patient vulnerability, identification of teachable moments for class-wide issues, and fostering a learning environment that encourages students to self-reflect on their behavior.

Significance: Beyond basic interviewing/exam skills, standardized patient encounters with feedback can provide insights to learners on inadvertent behaviors which might be judged unprofessional, including those interpretable as crossing personal boundaries. These interventions can help students recognize the ways their words, actions, and appearances may be interpreted.
Can registered nurses teach medical students how to be better interns? A multi-method analysis

Research Highlights
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Purpose: There is increasing awareness of the disconnect between the curriculum of medical school and the expectations of residency.(1) In particular, senior medical students are often unprepared to answer common intern-level pages, and a simulated paging curriculum has been shown to improve surgical students clinical decision-making and physician-nurse interpersonal communication.(2) The goal of our multi-method study is to examine the impact of a simulated paging curriculum on interpersonal communication and to qualitatively examine the feedback that registered nurses (RNs) provide to senior medical students on their paging performance.

Methods: Two trained RNs administered specialty-specific pages to 76 fourth-year medical students enrolled in residency preparation courses. RNs evaluated students performances on seven communication domains using validated 5-point Likert-type scales (1=worst, 5=best) in precision, instruction, assertiveness, direction, organization, engagement, and ability to solicit information.(3) Immediate verbal feedback was provided to the students and was audio recorded, transcribed, and analyzed using an appreciative inquiry approach to arrive at the final themes.

Results: During A total of 351 pages were administered over 4 weeks. Students from all specialties improved communication scores throughout the four weeks. Mean communication scores increased from 4.02 to 4.26 from week 1 to week 2 (<0.0001). Improvement was most pronounced for students in the internal medicine (3.82 to 4.25) and pediatrics courses (3.95 to 4.38) and less pronounced for students in the procedural specialties of surgery (4.26 to 4.22) and OB/GYN (4.07 to 4.18). Approximately half of the pages were recorded and analyzed.

Two main themes emerged from the analysis of the transcribed feedback data:

Positive reinforcement: The nurses provided positive reinforcement during the feedback sessions, including both general praise and specific commentary regarding aspects of the case in which the students were most successful. For example, one nurse commented, Great job. You asked if I had any other concerns, which was really, really great. I thought it was good that you verbalized that you would let your chief know, just for reinforcement, knowing that you’re new and it probably wouldn’t hurt to ask.

Post-feedback reflection: Some students reflected on aspects of the case that they had missed during the feedback session. For example, I should have definitely asked for the physical exam. I didn’t think about that. The dedicated time for verbal feedback also allowed students to ask clarifying questions, to which nurses had the opportunity to share their own clinical experiences. For example, in response to a question about medication dosing, the RN responded, Its better to always err on the side of caution and look things up, even if we have to wait because, real life, a new intern guessed and told me as a new nurse to push 80 IV of K. It just didn’t seem right to me, so I obviously didn’t do it. As you can imagine, that would have been a big problem.

Discussion: While Answering pages from nurses is an important aspect of a new interns clinical responsibilities. Our interprofessional simulated paging curriculum led to improvements in senior
medical students communication scores. Additionally, verbal feedback sessions allowed RNs to provide positive reinforcement and clinical expertise, while allowing students to reflect on feedback in real time, with the ability for feedback clarification.

**Significance:** This project demonstrates the value of an interprofessional model for improving senior medical students preparation for answering pages from nurses, a process requiring appropriate communication and medical decision making skills. Teaching and assessing communication skills is complex, and we expect the information learned from our simulated paging curriculum will guide medical school and residency curriculum development in the future.