REVIEWS

FUTURE: New Strategies for Hospitalists to Overcome Challenges in Teaching on Today's Wards

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Changes in the clinical learning environment under resident duty hours restrictions have introduced a number of challenges on today's wards. Additionally, the current group of medical trainees is largely represented by the Millennial Generation, a generation characterized by an affinity for technology, interaction, and group-based learning. Special attention must be paid to take into account the learning needs of a generation that has only ever known life with duty hours. A mnemonic for strategies to augment teaching rounds for hospitalists was created using an approach that considers time limitations due to duty hours as well as the preferences of Millennial learners. These strategies to enhance learning during teaching rounds are Flipping the Wards, Using Documentation to Teach, Technology-Enabled Teaching, Using Guerilla Teaching Tactics, Rainy Day Teaching, and Embedding Teaching Moments into Rounds (FUTURE). Hospitalists serving as teaching attendings should consider these possible strategies as ways to enhance teaching in the post-duty hours era. These techniques appeal to the preferences of today's learners in an environment often limited by time constraints. Hospitalists are well positioned to champion innovative approaches to teaching in a dynamic and evolving clinical learning environment. *Journal of Hospital Medicine* 2013;8:409–413. © 2013 Society of Hospital Medicine

The implementation of resident duty hour restrictions has created a clinical learning environment on the wards quite different from any previous era. The Accreditation Council for Graduate Medical Education issued its first set of regulations limiting consecutive hours worked for residents in 2003, and further restricted hours in 2011.[1] These restrictions have had many implications across several aspects of patient care, education, and clinical training, particularly for hospitalists who spend the majority of their time in this setting and are heavily involved in undergraduate and graduate clinical education in academic medical centers.[2,3]

As learning environments have been shifting, so has the composition of learners. The Millennial Generation (or Generation Y), defined as those born approximately between 1980 and 2000, represents those young clinicians currently filling the halls of medical schools and ranks of residency and fellowship programs.[4] Interestingly, the current system of restricted work hours is the only system under which the Millennial Generation has ever trained.

As this new generation represents the bulk of current trainees, hospitalist faculty must consider how their teaching styles can be adapted to accommodate these learners. For teaching hospitalists, an approach that considers the learning environment as affected by duty hours, as well as the preferences of Millennial learners, is necessary to educate the next generation of trainees. This article aimed to introduce potential strategies for hospitalists to better align teaching on the wards with the preferences of Millennial learners under the constraints of residency duty hours.

THE NEWEST GENERATION OF LEARNERS

The Millennial Generation has been well described.[4–10] Broadly speaking, this generation is thought to have been raised by attentive and involved parents, influencing relationships with educators and mentors; they respect authority but do not hesitate to question the relevance of assignments or decisions. Millennials prefer structured learning environments that focus heavily on interaction and experiential learning, and they value design and appearance in how material is presented.[7] Millennials also seek clear expectations and immediate feedback on their performance, and though they have sometimes been criticized for a strong sense of entitlement, they have a strong desire for collaboration and group-based activity.[5,6]

One of the most notable and defining characteristics of the Millennial Generation is an affinity for technology and innovation.[7–9] Web-based learning tools that are interactive and engaging, such as blogs, podcasts, or streaming videos are familiar and favored methods of learning. Millennials are skilled at finding information and providing answers and data, but may need help with synthesis and application.[5] They take pride in their ability to multitask, but can be prone to doing so inappropriately, particularly with technology that is readily available.[11]

Few studies have explored characteristics of the Millennial Generation specific to medical trainees.

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One study examined personality characteristics of Millennial medical students compared to Generation X students (those born from 1965–1980) at a single institution. Millennial students scored higher on warmth, reasoning, emotional stability, rule consciousness, social boldness, sensitivity, apprehension, openness to change, and perfectionism compared to Generation X students. They scored lower on measures for self-reliance.[12] Additionally, when motives for behavior were studied, Millennial medical students scored higher on needs for affiliation and achievement, and lower on needs for power.[13]

DUTY HOURS: A GENERATION APART

As noted previously, the Millennial Generation is the first to train exclusively in the era of duty hours restrictions. The oldest members of this generation, those born in 1981, were entering medical school at the time of the first duty hours restrictions in 2003, and thus have always been educated, trained, and practiced in an environment in which work hours were an essential part of residency training.

Though duty hours have been an omnipresent part of training for the Millennial Generation, the clinical learning environment that they have known continues to evolve and change. Time for teaching, in particular, has been especially strained by work hour limits, and this has been noted by both attending physicians and trainees with each iteration of work hours limits. Attendings in one study estimated that time spent teaching on general medicine wards was reduced by about 20% following the 2003 limits, and over 40% of residents in a national survey reported that the 2011 limits had worsened the quality of education.[14,15]

GENERATIONAL STRATEGIES FOR SUCCESS FOR HOSPITALIST TEACHING ATTENDINGS

The time limitations imposed by duty hours restrictions have compelled teaching rounds to become more patient-care centered and often less learner-centered, as providing patient care becomes the prime obligation for this limited time period. Millennial learners are accustomed to being the center of attention in educational environments, and changing the focus from education to patient care in the wards setting may be an abrupt transition for some learners.[6] However, hospitalists can help restructure teaching opportunities on the clinical wards by using teaching methods of the highest value to Millennial learners to promote learning under the conditions of duty hours limitations.

An approach using these methods was developed by reviewing recent literature as well as educational innovations that have been presented at scholarly meetings (eg, Sal Khan's presentation at the 2012 Association of American Medical Colleges meeting).[16] The authors discussed potential teaching techniques that were thought to be feasible to implement in the context of the current learning environment, with consideration of learning theories that would be most effective for the target group of learners (eg, adult learning theory).[17] A mnemonic was created to consolidate strategies thought to best represent these techniques. FUTURE is a group of teaching strategies that can be used by hospitalists to improve teaching rounds by Flipping the Wards, Using Documentation to Teach, Technology-Enabled Teaching, Using Guerilla Teaching Tactics, Rainy Day Teaching, and Embedding Teaching Moments into Rounds.

Flipping the Wards

Millennial learners prefer novel methods of delivery that are interactive and technology based.[7–9] Lectures and slide-based presentations frequently do not feature the degree of interactive engagement that they seek, and methods such as case-based presentations and simulation may be more suitable. The Khan Academy is a not-for-profit organization that has been proposed as a model for future directions for medical education.[18] The academy's "global classroom" houses over 4000 videos and interactive modules to allow students to progress through topics on their own time.[19] Teaching rounds can be similarly "flipped" such that discussion and group work take place during rounds, whereas lectures, modules, and reading are reserved for individual study.[18]

As time pressures shift the focus of rounds exclusively toward discussion of patient-care tasks, finding time for teaching outside of rounds can be emphasized to inspire self-directed learning. When residents need time to tend to immediate patient-care issues, hospitalist attendings could take the time to search for articles to send to team members. Rather than distributing paper copies that may be lost, cloud-based data management systems such as Dropbox (Dropbox, San Francisco, CA) or Google Drive (Google Inc., Mountain View, CA) can be used to disseminate articles, which can be pulled up in real time on mobile devices during rounds and later deposited in shared folders accessible to all team members.[20,21] The advantage of this approach is that it does not require all learners to be present on rounds, which may not be possible with duty hours.

Using Documentation to Teach

Trainees report that one of the most desirable attributes of clinical teachers is when they delineate their clinical reasoning and thought process.[22] Similarly, Millennial learners specifically desire to understand the rationale behind their teachers' actions.[6] Documentation in the medical chart or electronic health record (EHR) can be used to enhance teaching and role-model clinical reasoning in a transparent and readily available fashion.

Billing requirements necessitate daily attending documentation in the form of an attestation. Hospitalist

TABLE 1. Hospitalist Teaching Rounds for the FUTURE

FUTURE		Definition	Example Strategies
F	Flipping the Wards	Lectures, readings, and modules as materials for self-study and "homework" to encourage use of group time for interactive discussion	Emailing an article after rounds to review and discuss the next day Cloud-sharing landmark articles (eg, Dropbox) Messaging and chat platforms for discussion
U	Using Documentation to Teach	Using the chart as a platform for education and role-modeling in clinical documentation	Documenting your thought process in attending attestations/notes Using attending attestation to provide feedback on documentation and communication
T	Technology-Enabled Teaching	Technological devices and applications to augment bedside teaching and interactive discussions	Using apps on smartphones and tablet devices to highlight teaching points (eg, use of prognostic calculators) HIPAA-compliant SMS text-messaging or group chats to discuss patient updates and rationales for management
U	Using Guerilla Teaching Tactics	Exploiting the natural learning environment to facilitate teaching points	Teaching what is seen on rounds routinely (eg, census audit to remove Foley catheters, hand hygiene, indications for contact isolation, medication reconciliation) Checklists and quality measures incorporated into every presentation
R	Rainy Day Teaching	Saving important teaching points for a "rainy day" when there is more time for teaching	Noting teaching points from postcall or busy admission times to revisit during a less busy day Appointing certain team members as teaching residents to "outsource" clinical questions and bring back to the group
E	Embedding Teaching Moments into Rounds	Routinizing an expected teaching moment into rounds	Bringing focus of rounds back to bedside teaching and physical examination (eg, Stanford 25) Daily expected teaching moments, (eg, ECG or MKSAP question of the day)

NOTE: Abbreviations: ECG, electrocardiogram; HIPAA, Health Insurance Portability and Accountability Act; MKSAP, Medical Knowledge Self Assessment Program; SMS, short-message system.

attendings can use attestations to model thought process and clinical synthesis in the daily assessment of a patient. For example, an attestation "one-liner" can be used to concisely summarize the patient's course or highlight the most pressing issue of the day, rather than simply serve as a placeholder for billing or "agree with above" in reference to housestaff documentation. This practice can demonstrate to residents how to write a short snapshot of a patient's care in addition to improving communication.

Additionally, the EHR can be a useful platform to guide feedback for residents on their clinical performance. Millennial learners prefer specific, immediate feedback, and trainee documentation can serve as a template to show examples of good documentation and clinical reasoning as well as areas needing improvement.[5] These tangible examples of clinical performance are specific and understandable for trainees to guide their self-learning and improvement.

Technology-Enabled Teaching

Using technology wisely on the wards can improve efficiency while also taking advantage of teaching methods familiar to Millennial learners. Technology can be used in a positive manner to keep the focus on the patient and enhance teaching when time is limited on rounds. Smartphones and tablets have become an omnipresent part of the clinical environment.[23] Rather than distracting from rounds, these tools can be used to answer clinical questions in real time, thus directly linking the question to the patient's care.

The EHR is a powerful technological resource that is readily available to enhance teaching during a busy ward schedule. Clinical information is electronically accessible at all hours for both trainees and attendings, rather than only at prespecified times on daily rounds, and the Millennial Generation is accustomed to receiving and sharing information in this fashion.[24] Technology platforms that enable simultaneous sharing of information among multiple members of a team can also be used to assist in sharing clinical information in this manner. Health Insurance Portability and Accountability Act-compliant group text-messaging applications for smartphones and tablets such as GroupMD (GroupMD, San Francisco, CA) allow members of a team to connect through 1 portal.[25] These discussions can foster communication, inspire clinical questions, and model the practice of timely response to new information.

Using Guerilla Teaching Tactics

Though time may be limited by work hours, there are opportunities embedded into clinical practice to create teaching moments. The principle of guerilla marketing uses unconventional marketing tactics in everyday locales to aggressively promote a product.[26] Similarly, "guerilla teaching" might be employed on rounds to make teaching points about common patient care issues that occur at nearly every room, such as Foley catheters after seeing one at the beside or hand hygiene after leaving a room. These types of topics are familiar to trainees as well as hospitalist attendings and fulfill the relevance that Millennial learners seek by easily applying them to the patient at hand.

Memory triggers or checklists are another way to systematically introduce guerilla teaching on

commonplace topics. The IBCD checklist, for example, has been successfully implemented at our institution to promote adherence to 4 quality measures.[27] IBCD, which stands for immunizations, bedsores, catheters, and deep vein thrombosis prophylaxis, is easily and quickly tacked on as a checklist item at the end of the problem list during a presentation. Similar checklists can serve as teaching points on quality and safety in inpatient care, as well as reminders to consider these issues for every patient.

Rainy Day Teaching

Hospitalist teaching attendings recognize that duty hours have shifted the preferred time for teaching away from busy admission periods such as postcall rounds.[28] The limited time spent reviewing new admissions is now often focused on patient care issues, with much of the discussion eliminated. However, hospitalist attendings can be proactive and save certain teaching moments for "rainy day" teaching, anticipating topics to introduce during lower census times. Additionally, attending access to the EHRs allows attendings to preview cases the residents have admitted during a call period and may facilitate planning teaching topics for future opportunities.[23]

Though teaching is an essential part of the hospitalist teaching attending role, the Millennial Generation's affinity for teamwork makes it possible to utilize additional team members as teachers for the group. This type of distribution of responsibility, or "outsourcing" of teaching, can be done in the form of a teaching or float resident. These individuals can be directed to search the literature to answer clinical questions the team may have during rounds and report back, which may influence decision making and patient care as well as provide education.[29]

Embedding Teaching Moments Into Rounds

Dr. Francis W. Peabody may have been addressing students many generations removed from Millennial learners when he implored them to remember that "the secret of the care of the patient is in caring for the patient," but his maxim still rings true today.[30] This advice provides an important insight on how the focus can be kept on the patient by emphasizing physical examination and history-taking skills, which engages learners in hands-on activity and grounds that education in a patient-based experience.[31] The Stanford 25 represents a successful project that refocuses the doctor–patient encounter on the bedside.[32] Using a Web-based platform, this initiative instructs on 25 physical examination maneuvers, utilizing teaching methods that are familiar to Millennial learners and are patient focused.

In addition to emphasizing bedside teaching, smaller moments can be used during rounds to establish an expectation for learning. Hospitalist attendings can create a routine with daily teaching moments, such as

an electrocardiogram or a daily Medical Knowledge Self-Assessment Program question, a source of internal medicine board preparation material published by the American College of Physicians.[33] These are opportunities to inject a quick educational moment that is easily relatable to the patients on the team's service. Using teaching moments that are routine, accessible, and relevant to patient care can help shape Millennial learners' expectations that teaching be a daily occurrence interwoven within clinical care provided during rounds.

There are several limitations to our work. These strategies do not represent a systematic review, and there is little evidence to support that our approach is more effective than conventional teaching methods. Though we address hospitalists specifically, these strategies are likely suitable for all inpatient educators as they have not been well studied in specific groups. With the paucity of literature regarding learning preferences of Millennial medical trainees, it is difficult to know what methods may truly be most desirable in the wards setting, as many of the needs and learning styles considered in our approach are borrowed from other more traditional learning environments. It is unclear how adoptable our strategies may be for educators from other generations; these faculty may have different approaches to teaching. Further research is necessary to identify areas for faculty development in learning new techniques as well as compare the efficacy of our approach to conventional methods with respect to standardized educational outcomes such as In-Training Exam performance, as well as patient outcomes.

ACCEPTING THE CHALLENGE

The landscape of clinical teaching has shifted considerably in recent years, in both the makeup of learners for whom educators are responsible for teaching as well as the challenges in teaching under the duty hours restrictions. Though rounds are more focused on patient care than in the past, it is possible to work within the current structure to promote successful learning with an approach that considers the preferences of today's learners.

A hospitalist's natural habitat, the busy inpatient wards, is a clinical learning environment with rich potential for innovation and excellence in teaching. The challenges in practicing hospital medicine closely parallel the challenges in teaching under the constraints of duty hours restrictions; both require a creative approach to problem solving and an affinity for teamwork. The hospitalist community is well suited to not only meet these challenges but become leaders in embracing how to teach effectively on today's wards. Maximizing interaction, embracing technology, and encouraging group-based learning may represent the keys to a successful approach to teaching

the Millennial Generation in a post-duty hours world.

References

1. Nasca TJ, Day SH, Amis ES Jr; ACGME Duty Hour Task Force. The new recommendations on duty hours from the ACGME Task Force. *N Engl J Med*. 2010;363(2):e3.
2. Wachter RM, Goldman L. The emerging role of "hospitalists" in the American health care system. *N Engl J Med*. 1996;335(7):514–517.
3. Liston BW, O'Dorisio N, Walker C, et al. Hospital medicine in the internal medicine clerkship: results from a national survey. *J Hosp Med*. 2012;7(7):557–561.
4. Howe N, Strauss W. Millennials Rising: The Next Great Generation. New York, NY: Random House/Vintage Books; 2000.
5. Eckleberry-Hunt J, Tucciarone J. The challenges and opportunities of teaching "Generation Y." *J Grad Med Educ*. 2011;3(4):458–461.
6. Twenge JM. Generational changes and their impact in the classroom: teaching Generation Me. *Med Educ*. 2009;43(5):398–405.
7. Roberts DH, Newman LR, Schwarzstein RM. Twelve tips for facilitating Millennials' learning. *Med Teach*. 2012;34(4):274–278.
8. Pew Research Center. Millennials: a portrait of generation next. Available at: http://pewsocialtrends.org/files/2010/10/millennials-confident-connected-open-to-change.pdf. Accessed February 28, 2013.
9. Mohr NM, Moreno-Walton L, Mills AM, et al. Generational influences in academic emergency medicine: teaching and learning, mentoring, and technology (part I). *Acad Emerg Med*. 2011;18(2):190–199.
10. Mohr NM, Moreno-Walton L, Mills AM, et al. Generational influences in academic emergency medicine: structure, function, and culture (part II). *Acad Emerg Med*. 2011;18(2):200–207.
11. Katz-Sidlow RJ, Ludwig A, Miller S, Sidlow R. Smartphone use during inpatient attending rounds: prevalence, patterns, and potential for distraction. *J Hosp Med*. 2012;8:595–599.
12. Borges NJ, Manuel RS, Elam CL, et al. Comparing millennial and generation X medical students at one medical school. *Acad Med*. 2006;81(6):571–576.
13. Borges NJ, Manuel RS, Elam CL, Jones BJ. Differences in motives between Millennial and Generation X students. *Med Educ*. 2010; 44(6):570–576.
14. Arora V, Meltzer D. Effect of ACGME duty hours on attending physician teaching and satisfaction. *Arch Intern Med*. 2008;168(11):1226–1227.
15. Drolet BC, Christopher DA, Fischer SA. Residents' response to duty-hours regulations—a follow-up national survey. *N Engl J Med*. 2012; 366(24):e35.
16. Khan S. Innovation arc: new approaches. Presented at: Association of American Colleges of Medicine National Meeting; November 2012; San Francisco, CA.
17. Spencer JA, Jordan RK. Learner-centered approaches in medical education. *BMJ*. 1999;318:1280–1283.
18. Prober CG, Heath C. Lecture halls without lectures—a proposal for medical education. *N Engl J Med*. 2012;366(18):1657–1659.
19. The Khan Academy. Available at: https://www.khanacademy.org/. Accessed March 4, 2013.
20. Dropbox. Dropbox Inc. Available at: https://www.dropbox.com/. Accessed April 19, 2013.
21. Google Drive. Google Inc. Available at: https://drive.google.com/. Accessed April 19, 2013.
22. Sutkin G, Wagner E, Harris I, et al. What makes a good clinical teacher in medicine? A review of the literature. *Acad Med*. 2008; 83(5):452–466.
23. Baumgart DC. Smartphones in clinical practice, medical education, and research. *Arch Intern Med*. 2011;171(14):1294–1296.
24. Martin SK, Tulla K, Meltzer DO, et al. Attending use of the electronic health record (EHR) and implications for housestaff supervision. Presented at: Midwest Society of General Internal Medicine Regional Meeting; September 2012; Chicago, IL.
25. GroupMD. GroupMD Inc. Available at http://group.md. Accessed April 19, 2013.
26. Levinson J. Guerilla Marketing: Secrets for Making Big Profits From Your Small Business. Boston, MA: Houghton Mifflin; 1984.
27. Aspesi A, Kauffmann GE, Davis AM, et al. IBCD: development and testing of a checklist to improve quality of care for hospitalized general medical patients. *Jt Comm J Qual Patient Saf*. 2013;39(4):147–156.
28. Cohen S, Sarkar U. Ice cream rounds. *Acad Med*. 2013;88(1):66.
29. Lucas BP, Evans AT, Reilly BM, et al. The impact of evidence on physicians' inpatient treatment decisions. *J Gen Intern Med*. 2004; 19(5 pt 1):402–409.
30. Peabody FW. Landmark article March 19, 1927: the care of the patient. By Francis W. Peabody. *JAMA*. 1984;252(6):813–818.
31. Gonzalo JD, Heist BS, Duffy BL, et al. The art of bedside rounds: a multi-center qualitative study of strategies used by experienced bedside teachers. *J Gen Intern Med*. 2013;28(3):412–420.
32. Stanford University School of Medicine. Stanford Medicine 25. Available at: http://stanfordmedicine25.stanford.edu/. Accessed February 28, 2013.
33. Medical Knowledge Self-Assessment Program 16. The American College of Physicians. Available at: https://mksap.acponline.org. Accessed April 19, 2013.