



Lessons from **#Millennials** and Clinical Curricular Innovation @UTSW

Adrian Salazar, M.D.
Division of General Internal Medicine
University of Texas Southwestern Medical Center

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Adrian Salazar, MD
Assistant Professor
Department of Internal Medicine
Division of General Internal Medicine
adrian.salazar@utsouthwestern.edu

BIOSKETCH

Adrian Salazar grew up in Waco, TX, completed his BA in Plan II Liberal Arts and BS in Chemical Engineering at UT Austin, and completed his medical degree at UT Southwestern in 2005. He completed his residency in internal medicine at UT Southwestern in 2008, and then joined the UT Southwestern faculty in the Division of General Internal Medicine. In addition to managing patients in his primary care practice, he has been involved in resident and undergraduate medical education. He has been a Colleges Mentor since 2011. He developed the 3rd-year clinical curriculum for UT Dallas students in the UT-PACT program, and is currently co-directing the new Ambulatory Care Clerkship. He is an enthusiastic Gen-Xer.

PURPOSE

Discuss the characteristics of the Millennial generation and Millennial medical students in the context of evolving undergraduate medical education curricula, focusing on innovative changes at UT Southwestern, and provide practical guidance for educators in working with Millennials and confronting generational gaps.

OBJECTIVES

Discuss characteristics of Millennials and implications for medical education

Describe strategies to bridge generational gaps in medical education

Describe the context of change in medical education, and how innovative approaches compare with Millennial learning preferences.

Describe strategies to engage Millennial students in medical education, specifically in early clinical training, and the utilization of technology and social media

Describe the development and implementation of the New Curriculum at UTSW, in addition to novel clinical curricula for UT-PACT and the Ambulatory Care Clerkship

INTRODUCTION

Millennials (born approximately between 1981-1997) are now the largest and most racially/ethnically diverse generation in the US, and constitute the largest US work force cohort. Medical school applications and enrollments are increasing, led by Millennials. Millennials in medicine are facing an increasingly complex health care landscape, characterized by rapid advances in medical knowledge, technology, and treatments, changing access to health care, increasing standards in quality and safety, an aging and more diverse patient population, and anticipated doctor shortages. Medical school curricula are evolving to better prepare students for challenges in modern medicine, and schools are adapting educational processes to meet the needs of a Millennial generation that places more emphases on use of technology and individualized and experiential learning. There is increased focus on early clinical training, integration of basic sciences and clinical education, learning outcomes and clinical competencies. A new generation with varied goals and career aspirations, being taught by older generations, may expose generational gaps, and curricular innovation requires that medical schools and older generations accept culture change, which is not easy. In this context, we seek to better understand and better educate the Millennial generation.

DEFINITIONS

Boomer: Short for “Baby Boomer,” the generation born between 1946 and 1964

Drake: Grammy award-winning rapper, songwriter, actor. Millennial icon.

Facebook: Social Media site with 1.13 billion active daily users. If you are not on Facebook, you are probably *not* a Millennial.

FoMO: “Fear Of Missing Out.” Opposite of JoMO, “Joy of Missing Out,” coined by Millennials.

Gen-Xer: From Generation X (born between 1965 – 1980)

Generation Y: see “Millennials”

J. Cole: Grammy-nominated rapper, songwriter, producer. Millennial icon.

Memes: Millennials love these!

Millennials: see “Generation Y”

Pokémon Go: I don’t really get this.

Snapchat: I don’t really get this one either.

Taylor Swift: Millennial icon. My Colleges students gifted me her latest CD, so as to enhance my pop cultural competency. Apparently, in any feud involving her versus anyone else, you should side with her, not because she is always right, but *because she is Taylor Swift*.

Twitter: Social media site with 310 million active monthly users

UT-PACT: Partnership in Advancing Clinical Transition, a combined BA/MD program and novel partnership between UT Dallas and UTSW.

What a Time to Be Alive: Mixtape collaboration by rappers Drake and Future. This phrase was on the white board (pictured front page) in my UT-PACT small group room in Fall 2015. It became the basis for reflective assignments, and was a recurring theme/anthem for the year. I found out later, on my own, that this was a record title, not the deep, existential message conveyed by a mysterious white board author that I presumed it was. Nevertheless, the phrase/title remained inspirational and put my young students’ lives and our generational gap into sharper focus.

MY APPROACH TO CLINICAL EDUCATION

My college senior thesis examined student and faculty experiences in an innovative “alternative” high school in East Austin. This school aimed at recovering dropouts and retaining at-risk youth through *flexible, individualized and self-paced curricula, tutors, and close, caring support*. This has stuck with me.

My experience in medical education at UTSW comes from being a student, a resident, and now as a clinician educator, with wonderful experiences working with excellent clinicians, mentors, peers, students and staff, in addition to countless meaningful patient care opportunities. Much of what I have learned about Millennial student preferences and learning styles has come from facilitating group learning sessions, working with them in various preceptorships and mentoring activities (especially Colleges), and *simply asking them what they like*. I have been involved in clinical curricular development in UT-PACT and the new Ambulatory Care Clerkship. Here is some of what I’ve learned over time:

Minimize lecture, and make any necessary lecture very interactive. Use technology, or learn to use new technology in education – including learning from students. Clinical curricula must be experiential, challenging and engaging, and should offer meaningful opportunities for students to demonstrate clinical competencies over time and across different clinical settings. Students must be self-motivated learners to optimize their learning and educational opportunities. We must have high expectations for clinical competency and professionalism. Early clinical education should take place in both small group sessions and clinical preceptorships, with students responsible for self-directed learning, actively participating in teams, peer-to-peer teaching, and making the most of every learning opportunity. Students should appreciate and understand the multiple dimensions of patient care, including cultural, psychosocial and healthcare system contexts. Curricular implementation should involve student input and improve with student feedback, and must adapt to student learning styles and preferences. Curricula must embrace student wellness, allow ample opportunity for students to reflect and express their creativity, and take place in a supportive learning environment. Faculty role models are essential. This requires many educators doing their part to engage students and expose them early to real-world medical practice, and to share what preceptor/mentoring strategies work for best them.

WHO ARE THE MILLENNIALS?

Other than reflecting on my experiences teaching students and residents, another reason I became interested in the Millennial generation: I’ve had multiple conversations about them with Boomer and Gen-X faculty since joining UTSW faculty in 2008. These conversations go something like this: *These kids are very smart! Is it just because they look stuff up on their phones? They teach me about anything I need to know about the internet, and my phone... thankfully we have them to help us! They don’t seem like they make a good effort to do what needs to be done on the wards. Can you believe they ask for days off for friends’ weddings? Must they be on their cell phones at all times? During rounds? Really? Can they even communicate without texting?*

There are a lot of physician authors writing about Millennial trainees, reinforcing views of Millennials as having poor work ethic, but many of these are opinion pieces and personal experiences, with original studies of attitudes/perceptions that older generation physicians have of Millennials lacking. In my experience working with Millennial trainees at UTSW, I generally

find them to be incredibly talented people with strong drive to succeed. At times, I have seen some lack in willingness to put much effort into assignments, and also some lapses in professionalism. Are my memories of these incidents influenced by some stereotyping reinforced by the conversations above? Doesn't each new generation bring some kind of resentment and conflict with older generations? We must be aware that generalizations and stereotypes can be dangerous, and that individual students may not fit into characteristics commonly attributed to Millennials. For our purposes here, we will discuss common characteristics and themes that recur in studies to highlight important points, keeping in mind that these can vary between studies and over time. The goal is to provide a useful framework for developing new approaches to teaching and curricular design, while self-reflecting on personal biases and misconceptions.

Millennial demographics and characteristics

Millennials are heavily researched, and are described in many ways in the literature. General themes/characteristics have emerged about Millennial preferences, attitudes and behaviors in socioeconomic and educational contexts, and the following attempts to briefly summarize current demographics and commonly accepted generalizations.

Demographics

Millennials are now the largest and most diverse population in the US, and constitute the largest generation in the US workforce (Figures 1-3). They are also the most educated generation in US history.

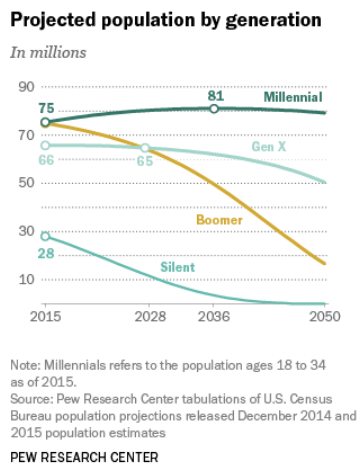


Figure 1

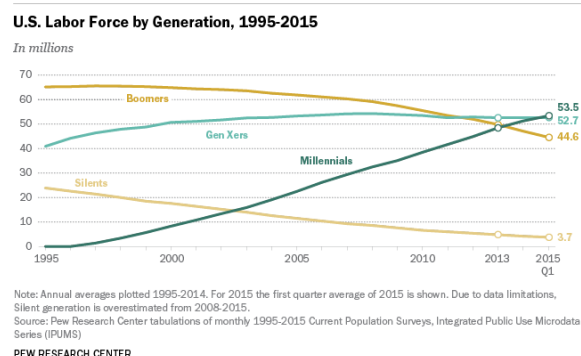


Figure 2

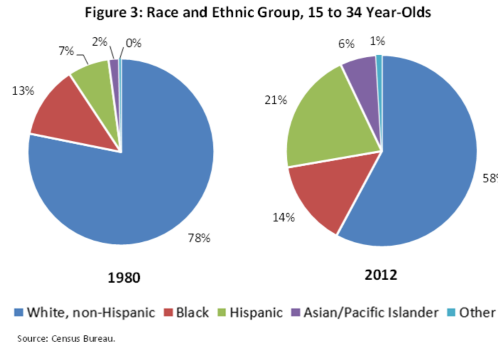


Figure 3 (www.whitehouse.gov/sites/default/files/docs/millennials_report.pdf)

In Education

Millennials are often referred to as “digital natives” as most do not remember a time before the Internet and computer technologies. As children, according to research, they were overprotected, overscheduled, and awarded a lot of trophies for participation. In school, they used technology in the classroom, were given a lot of positive feedback, participated extensively in scheduled school-related and extracurricular activities, allowed absences for nonacademic events, and subjected to grade inflation. This background results in potential generational conflicts in higher education.¹⁻⁵

Positive attributes of Millennials: Confident, optimistic, tolerant, socially conscious, generous, team-oriented, tech savvy, drive to succeed, high expectations.

Negative attributes of Millennials: Coddled, entitled, narcissistic, need instant gratification, too dependent on technology, “lazy” in expecting better grades for less work and allowances of time for leisure activity.

Often described as “multitaskers,” (although many experts argue that people/our brains cannot actually multitask), they are constantly connected through mobile technology and social media, and are used to instant access to information.

According to economic survey data, Millennials value community, family and creativity, placing more emphasis on recreational time, contribution to society, living close to friends and family, and experiencing things in new ways (Figure 4). In college, they are more likely to major in social sciences and humanities (Figure 5).

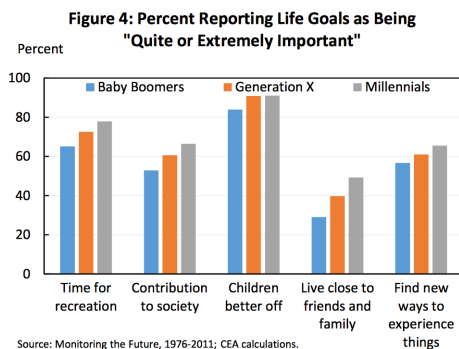


Figure 4

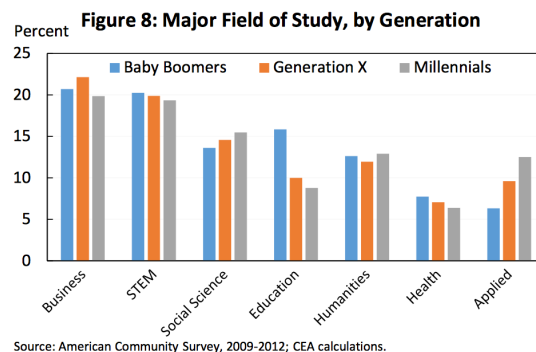


Figure 5

Jean Twenge, PhD, contradicts the community/civic-mindedness characterizations of Millennials, and coined the term “Generation Me,” which includes Millennials in a wider age range (from 1970). According to Twenge, this generation is more interested in extrinsic life goals rather than civic-mindedness. Students in Generation Me are characterized by narcissism and entitlement. Expectations of having plenty of leisure time and getting good grades just for “trying,” perfectionism, and overconfidence, result in frustration and disappointment, and may difficulties in higher education.¹⁻²

MILLENNIALS IN MEDICINE

Millennials are everywhere in medicine: students, residents, fellows, our newest faculty, our new patients, our patient’s children/grandchildren, etc.

Millennial Patients

Our patients are internet and tech savvy, with access to myriad health information websites, and wearable technologies monitoring vital signs and “health” and generating loads of data. In this context, potential conflicts in patient-provider relationships can arise, especially if providers hold onto paternalistic and doctor-makes-all-the-decisions approaches to medical care. Medical information is now open-access and widely available, not confined to medical professionals. Doctors are increasingly called on to help interpret and evaluate the quality of information that patients find online, and to engage in shared decision-making. Technology can be patient empowering and potentially fortify patient-provider relationships (i.e., communication through EHR or other online application).

In a review of survey data on Millennials as health care consumers, the following trends were noted (compared with older generations): 1) Most do not schedule preventative clinic visits. 2) They are cost-conscious and more likely to ask about and compare costs. 3) They are more likely to forgo care due to expense. 4) They are more likely to use online reviews to select providers. 5) They prefer mobile apps for scheduling. 6) They are more interested in telemedicine.⁶

Millennial Medical Trainees

In 2015, 20,630 students (52% male/48% female) enrolled in US medical schools, representing an increase in enrollment by 25% since 2002 (AAMC reports). The number of applicants is increasing, and classes are becoming more diverse. Factors that are thought to contribute to increased application and enrollment include: 20 new medical schools established since 2002, and students looking for more secure occupations amid recovery from the Great Recession and a growing health care economy. Also, some consider the possibility of Millennials being attracted to jobs that benefit society, and schools that are establishing innovative curricular changes that better align with Millennials’ preferences or expectations.

According to the AAMC, in 2015: “Hispanic or Latino enrollees increased by 6.9 percent to 1,988 (applicants increased by 10.3 percent to 4,839), African-American enrollees rose 11.6 percent to 1,576 (applicants increased by 16.8 percent to a total of 4,661), and although American Indian and Alaska Native enrollees decreased by 3.5 percent to 195, the number of applicants increased by 2.9 percent (to 462 in 2015).”

www.aamc.org/newsroom/newsreleases/446400/applicant-and-enrollment-data.html

Work-life Balance

Millennial medical trainees and physicians place greater emphasis on leisure, personal and family time, and flexible work schedules, compared with self-sacrifice and defining themselves by their career.¹⁻² This sets up potential conflicts in job expectations and career advancement.

“Lifestyle friendly” specialties are more sought after than primary care. Also, the number of doctors working part-time in various specialties has increased in recent years. In a 2011 New York Times Op-Ed piece, anesthesiologist Dr. Karen Sibert (a Gen-Xer) criticized this trend, especially in the contexts of duty to patients and a looming doctor shortage. She argued:

“Students who aspire to go to medical school should think about the consequences if they decide to work part time or leave clinical medicine. It’s fair to ask them — women especially — to consider the conflicting demands that medicine and parenthood make before they accept (and deny to others) sought-after positions in medical school and residency. They must understand that medical education is a privilege, not an entitlement, and it confers a real moral obligation to serve... Patients need doctors to take care of them. Medicine shouldn’t be a part-time interest to be set aside if it becomes inconvenient; it deserves to be a life’s work.”

www.nytimes.com/2011/06/12/opinion/12sibert.html

This touched off a lot of debate. Countering arguments that have been made are largely practical and economic, and may be summed up as follows: If the field of medicine is to attract the best and brightest young physicians and meet physician demand in a competitive job market and looming provider shortages, it must be more flexible and accommodating, which may also help to retain older physicians by reducing burnout and early retirement.

The 2012 Annals of Internal Medicine article, “Burnout and Satisfaction With Work-Life Balance Among US Physicians Relative to the General US Population,” showed that physicians were more likely to have symptoms of burnout and be dissatisfied with work-life balance compared with adults in the general workforce. Highest rates of burnout were seen in family medicine, general internal medicine, and emergency medicine.⁷

Addressing work-life balance issues, then, may be more critical for recruitment and retention in primary care fields, as more Millennials seek “lifestyle” specialties and/or part time positions. It remains to be seen whether increasing demand for physicians, and increasing numbers of Millennials in the ranks of faculty now and in the near future, will contribute to a process of “culture change” for enhancing work-life balance in the medical profession. Another issue to determine is how many Millennial graduates will choose to forgo residency, and pursue careers outside of medicine or not involving clinical care.

Personality Characteristics of Millennials and Implications for Medical Education

Studies of Millennials in higher education are often qualitative and look into attitudes and behaviors. In 2006, Borges et al, *quantitatively* examined personality differences between Generation Xers and Millennials at one medical school, analyzing responses from 809 students who completed a 16 Personality Factor Questionnaire (a validated measure of 16 independent dimensions of personality). There were significant differences in 10 of the 16 factors. Millennial students scored significantly higher in Rule-Consciousness (*dutiful*), Emotional Stability (*adaptive and mature*), Perfectionism (*organized and self-disciplined*), Openness to Change (*experimenting*), Warmth (*outgoing*), Reasoning (*more abstract than concrete*), Social Boldness (*adventuresome*), Sensitivity (*sentimental*), and Apprehension (*self-doubting and worried*).

Generation Xers scored significantly higher on Self-Reliance (*solitary and individualistic*). Differences between males and females were not assessed.³

In 2010, Borges, et al, extended this work to determine if generational differences (between Gen-X and Millennials) occur in motive, a domain of human assessment apart from ability and personality, using the Thematic Apperception Test. Four hundred and twenty-six students at one medical school participated. Millennial students scored higher on the needs for Achievement and Affiliation, which lead the authors to suggest their findings substantiate theories that “Millennials have greater needs to belong to social groups and to share with others, stronger team instincts and tighter peer bonds, and greater needs to achieve and succeed.”⁴ From a practical medical education standpoint, they suggest that educators:

- Utilize group activities
- Allow students to “learn by doing” and actively apply knowledge and skills
- Provide “relationship-building opportunities in the classroom or online that contribute to collaboration and teamwork
- Clearly specify educational goals and objectives
- Provide regular feedback

Many questions have emerged from these and other studies on Millennials in medical education, but there remains limited high quality evidence for establishing best practices. Questions of particular concern:

- How should medical schools take generational differences into account when revising curricula?
- How should educators change their pedagogical approach and methods of evaluation (including integration of technology)?
- Do Millennial *medical students* have similar attitudes, behaviors, and preferences as other Millennials in higher education, or are there substantial differences due to selection?
- How should mentoring and advising change to meet Millennial needs?
- What are the implications for promoting and assessing professionalism?
- Can faculty development help in bridging generational differences in teaching and mentoring?

Millennial medical education issues are not confined to medical school. Graduate medical education faces similar challenges, and strategies to bridge generation gaps and innovate in medical education should be developed and applied across all levels of education.⁸⁻⁹

Bridging the Generational Gap: Technology

Millennial physicians will have access to more medical knowledge, technology and treatments than prior generations, and it is essential that we train them throughout medical school using technology and innovative curricular approaches to better prepare them for a changing health care environment.

Web-based curricula in various forms offer potential advantages over traditional means of educating, such as removal physical barriers (distance learning), greater time flexibility (convenient access, completion of self-paced asynchronous modules), searchable content and links to additional educational sites, and online interactivity.

Our trainees can access needed facts almost instantly through web resources and apps, and also patient health information through secure mobile connections to EHRs. Curricular design, then, may be more relevant and engaging if technology is fully integrated, and if students are *expected* to use mobile devices to access necessary information in the setting of clinical problem solving and team-based learning activities. Faculty can learn a lot about the use of new, widely accessible technologies from Millennial trainees, and Millennials can inform the integration of technology in curricula, in addition to the development of policies related to the use of technology.

Simulation is an increasingly utilized modality for skills learning and assessment, and team training, and another great example of integrating new technology into medical curricula.¹⁰⁻¹¹ At UTSW, team simulations with mannequins are currently used in both undergraduate and graduate medical education. This is being greatly expanded with more hi-fidelity mannequins and more space in the new medical education building on West Campus planned for completion in 2018. iHuman is one example of an interactive, multimedia simulation tool providing immersive virtual patient care experiences. It can be used in individualized and team-based contexts, providing immediate feedback and assessing clinical competencies (www.ihuman.com/homepage/). Gamification, applying gaming elements to web modules or simulation, could further engage and assess Millennial learners who have extensive experience with video games.¹²

Clinical educators are charged with the great task of preparing students for future practice, but we must confront a more complex learning environment and rapid health care changes that make the future of medicine more uncertain, and be prepared *to learn from and along with* this generation of learners likely more tech savvy than we are. Perhaps students can be best prepared for the challenges and opportunities presented by new technologies if clinical curricular objectives and competencies, and faculty development efforts, can keep pace.

Bridging the Generational Gap: Social Media

Millennials embrace social media. While social media has become a fundamental part of social life for many of us, this is especially true for the Millennial generation (in fact, Millennials are right here on their smart phone/pad/watch multitasking and accessing some form of social media *right now* – go ahead, look at them!). While students expect to use new technologies (web-based curricula, applications, podcasts, e-books, etc.) in medical education, using social media is not necessarily a demand, nor is its use by course directors widespread. Integrating social media into clinical curricula can be a powerful way to connect with tech-savvy learners, to bring together students engaged in a particular course or in a more general learning community, to enrich clinical curricula through collaboration and idea sharing, to educate on digital professionalism, and to help to bridge generational gaps. Social media offers many opportunities to innovate in medical education, and given its prevalence and the fact that it's an important part in the social lives of most medical students, it's not really a question of whether or not we should try to integrate this into curricula, but *how* we should do it.

However, many non-Millennial educators may not be comfortable using newest technologies or social media, and may be slow to adapt. While adopting new social media approaches may require a shift in pedagogical tradition, doing so could be viewed from a faculty development standpoint for clinician educators, and a part of lifelong learning. Popular social media sites like Facebook and Twitter are relatively easy to use and have privacy settings allowing for restricted participation. Start-up is easy, and Millennial students themselves can help lead the way to curricular integration.

Cheston, et al, in 2013, published a systematic review of 14 articles (low or moderate quality studies, one RCT) on use of social media at any level of medical education. Social media interventions were associated with improved knowledge (e.g., exam scores), attitudes (e.g., empathy), and skills (e.g., reflective writing). The most commonly reported opportunities were learner engagement (71%), feedback (57%) and professional development (36%). The most common challenges were technical problems (43%), variable learner participation (43%), and privacy/security concerns (29%).¹³ In a subsequent qualitative study, using the full set (total 99) of articles, the authors compared commentaries and descriptive accounts versus evaluative studies of social media in medical education. The most commonly discussed challenge was the potential for social media to affect professionalism adversely, and it was concluded that the focus in early literature on this subject focuses more on the challenges rather than opportunities of using social media in medical education. Historically, this was compared with similar commentaries and opinion pieces published in the early years of both problem-based learning and simulation, before the evidence based accumulated to support their use.¹⁴

Twitter

We very recently started a closed Twitter account for the Ambulatory Medicine Clerkship. Similar to our Facebook page (below), our goal will be to efficiently deliver educational content and course updates to students, and possibly integrate into didactic sessions for greater interaction and engagement. Others have looked at Twitter as a “push technology,” reinforcing learning objectives through regular educational tweets. Limitations include unilateral feeds and inconsistent generation of discussion, which could potentially be remedied through linkage to Facebook.¹⁵

Some authors like to reference Phil Baumann, a registered nurse, who in 2009 reported 140 uses for Twitter in health care. Here they are:

No, never mind. You can Google his name and find the long list (<http://philbaumann.com/140-health-care-uses-for-twitter/>). Note that those counting have found 21 of these related to medical education.

Forgie, et al, in Twelve Tips for Using Twitter as a Learning Tool, notes that “Twitter is designed to and used as a vehicle to have a conversation and share ideas,” and “may be the most likely candidate for integrating social networking and medical education.”¹⁶ Notable tips include:

- Set ground rules for use and promote guidelines for professional behavior.
- Display live Twitter chat during lectures (to enhance participation)
- Use as a platform to convey credible information sources to students
- Use to create a “real life” context for students (link to current news stories)
- Use for real-time feedback
- Encourage creativity and communication with brevity and depth
- Self and group reflections on clinical experiences
- Use for informal polls

Facebook

What happens when you take a Facebook page, and take away *Facebook check-ins at restaurants, check-ins at airports, vacation pics, pics of dessert, pics of alcohol, pics of people consuming dessert and alcohol, gratuitous selfies, political rants, religious rants, tasteless memes, Facebook games, Facebook challenges, and profound existential meditations?* You get a boring News Feed, but also the foundation for an efficient virtual learning platform. Make

a closed group of medical students and faculty; add some professionalism guidelines and your own flavor as group administrator (links to scientific articles or news stories from various sources relating topics discussed in class, pop culture correlates, meaningful comments and reflection, and pics promoting wellness and teamwork, etc.). You now have a powerful way to expand discussions and enhance learning, using ubiquitous technology that students are already using.

With social media, you can have almost instant access to students checking their social media notifications more often than their email. You can post something and see right away who has viewed your post. And is there anything more validating and confidence boosting than getting “Likes” and happy emojis for your posts? No.

In my experience, basic engagement (accessing posts) is high, and I’m reasonably confident that those opening posts actually read them. A smaller, but still significant number of students, more actively post their own comments and links, and/or comment on posts from others. Overall, I’ve found that find this experience helps to empower students, providing a venue for more reticent and introverted students to “voice” their thoughts and questions (especially in UT-PACT), and for all to take more responsibility in leading group learning. While facilitating Facebook interaction and education can sometimes be time-consuming, I feel it’s more productive than many other social media activities, and I can always save some discussion for class.



Figure 6: Ambulatory Care Clerkship Facebook Page (and my daughter’s blackboard)

Digital professionalism

There are no best practices or established guidelines for managing social media groups in medical education, but professionalism and HIPAA compliance are imperative.

There are studies on digital unprofessionalism among students¹⁷ regarding public presence and postings, where professional and social/personal boundaries blur. Various authors have explored how digital professionalism can be integrated into medical curricula.¹⁸ The AMA published guidelines for social media use,¹⁹ and institutions create specific policies, which should be emphasized to medical trainees. UTSW’s policy for proper use of social media by residents and fellows is a good example, found here:

www.utsouthwestern.edu/edumedia/edufiles/education_training/gme/policies/social-media.pdf

Future study

There are not enough studies to determine best practices in using social media in higher education. Future research (quantitative and qualitative studies) will need to look into 1) whether integration of social medical in clinical curricula leads to improved learning outcomes, 2) what specific social media applications contribute to learning, 3) what competencies can be assessed and how (including the utility of “digital badges” to determine mastery of content), and 4) professionalism issues.

Social media cannot address all medical education needs, but can be powerful as a supplement to augment clinical curricula. Students can be empowered in the “flat democracy” of social media, but the vast amounts of information they access and share in the context of medical education and peer to peer teaching must be monitored and evaluated for quality, and the best way to do this remains to be determined. Clinical educators remain essential to direct multifaceted, multimedia curricula, facilitate group learning, identify and address deficiencies in course content and student learning, oversee hands-on experiential learning, and to role model professionalism and clinical excellence. Moreover, social media and other technologies (i.e., simulations) cannot completely replace actual patient encounters, and an entirely virtual/simulated clinical course is untenable.

CLINICAL CURRICULAR DEVELOPMENT

Context for Innovation

The “Flexner model” of 2 years of basic sciences followed by 2 years of clinical training is now over 100 years old. Given the realities of modern health care, this model is increasingly viewed as out of date and in need of change.

For the past two decades, revisions and innovations in educational processes have focused on the integration of basic sciences and clinical curricula in the pre-clerkship period, and expansion of clinical learning opportunities, emphasizing competency assessment and learning outcomes. Earlier clinical training is common. Innovations are predicated on assumptions that doctors will need better training in certain skill sets (e.g., longitudinal care, motivational interviewing and behavioral change, cultural competency, interdisciplinary education, leadership), or new skill sets (e.g., EHR, quality and safety, patient navigation, informatics, population health) to meet modern health care demands. In addition, the integration of behavioral and social sciences curriculum throughout medical school has been promoted.²⁰

There are premedical implications. Curricula are responding to changes in medical school curricula and the MCAT. The new MCAT, updated in 2015, includes a “ Psychological, Social, and Biological Foundations of Behavior” section. In addition, some medical schools are looking more closely at non-science majors and non-traditional students in the admissions process.

The AMA Accelerating Innovation in Medical Education Consortium is a consortium of 32 medical schools that received grants to develop innovative medical education curricula and share best practices. Major areas of innovation include the development of flexible, competency-based pathways, health systems science, integration with health care delivery systems, integrating technology, team-based care, developing lifelong learners, achieving diversity, addressing health care in underserved areas, and patient outcomes.

www.ama-assn.org/ama/pub/about-ama/strategic-focus/accelerating-change-in-medical-education/innovations.page

The UT System's Transformation in Medical Education (TIME) initiative developed a framework for early competency-based education and professional identity formation, and promotes an accelerated path into and through UT system medical schools. UT-PACT (discussed below), a new partnership between UT Dallas and UTSW, is one of three currently operating pilot programs. Core competencies in professionalism, patient care, communication skills and collaboration, medical knowledge, practice-based learning and improvement, and systems-based practice and management are emphasized, with assessment based on “transitional

milestones” that include application of foundational sciences and evidence-based medicine in clinical contexts, participation in community service and inter-professional learning experiences, and adherence to medical ethics principles. <http://www.utsystem.edu/sites/transformation-medical-education>

Many authors have proposed strategies for improving Millennial learning in medical education (Roberts, et al, from Harvard Medical School offers a solid framework of twelve tips for faculty educators)²¹. Many of the proposed and/or implemented innovative curricular changes are aligned with Millennial preferences, such as use of technology (web curricula and online modules, mobile apps, simulations), team learning (flipped classes and TBL, inter-professional education), and individualization (self-paced modules, competency-based curricula, and scholarly activities, and electives). Are alignments based on Millennial preferences, or unintentional? Where they are not aligned, will significant generational gaps persist and inhibit learning? What are the implications for graduate medical education (GME)? Will any gains in new curricular approaches be lost if GME does not adopt similar approaches?

Clinical Competency

In 2013, the Accreditation Council for Graduate Medical Education (ACGME) partnered with the American Board of Medical Specialties (ABMS) in the Milestone Project to develop a framework of milestones for demonstrating progressive clinical competencies before graduating from residency. This effort helped to prompt a similar effort for medical students. In 2014, the Association of American Colleges (AAC) published the Core Entrustable Professional Activities (EPAs) for Entering Residency (below), establishing a framework for a common set of behaviors and integrated competencies that should be expected of all medical graduates, meant to supplement medical school-specific graduation competencies.²² Inherent to the assessment of EPAs is faculty development in teaching and observing EPAs, and validated assessment tools. The EPAs are:

1. Gather a history and perform a physical exam
2. Prioritize a differential diagnosis following a clinical encounter
3. Recommend and interpret common diagnostic and screening tests
4. Enter and discuss orders and prescriptions
5. Document a clinical encounter in the patient record
6. Provide an oral presentation of a clinical encounter
7. Form clinical questions and retrieve evidence to advance patient care
8. Give or receive a patient handover to transition care responsibly
9. Collaborate as a member of an inter-professional team
10. Recognize a patient requiring urgent or emergent care and initiate evaluation and management
11. Obtain informed consent for tests and/or procedures
12. Perform general procedures of a physician
13. Identify system failures and contribute to a culture of safety and improvement

The New Curriculum at UTSW

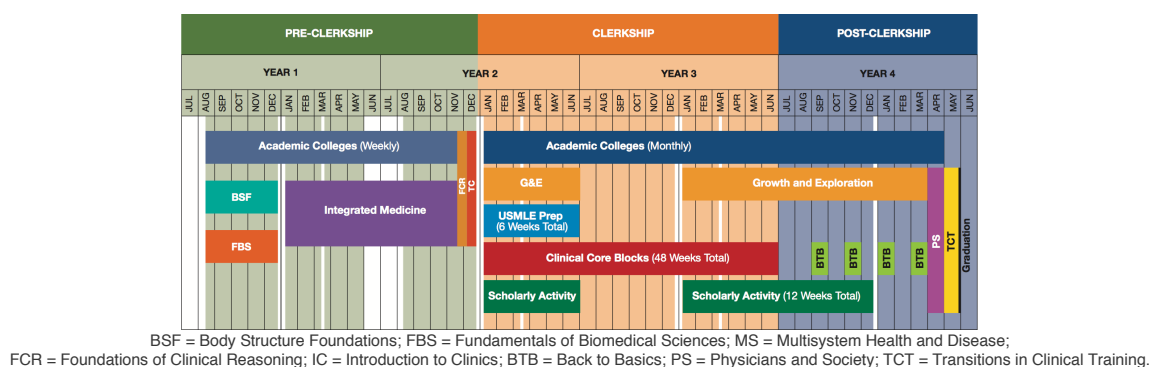


Figure 7 www.utsouthwestern.edu/education/medical-school/index.html

Establishing a “forward-looking” curriculum, and improving upon an already strong educational foundation, has been a UTSW strategic priority. According to the UTSW Strategic Planning Committee, the New Curriculum, launched in 2015, aims to improve medical education at UTSW through curricular integration and elimination of redundancies, and incorporating “more active learning with robust technological and facilities support.”

There are 3 main periods, defined as: 1) the 18-month **Pre-Clerkship** period integrating 1st and 2nd year curricula, emphasizing foundational biomedical science and clinical skills training (Colleges); 2) the 18-month **Clerkship** period, which includes the Core Clerkships, a scholarly activity curriculum including tracks for MD with Distinction, “Growth and Exploration” (electives and sub-internships), Colleges, and USMLE preparation; 3) the 12-month **Post-Clerkship** period with additional electives, more required courses, and Colleges. This framework is more flexible in allowing students to take more electives, explore more career options, and individualize pathways through medical school.

Academic Colleges, our extraordinary learning communities comprised of small groups meeting regularly with faculty mentors, will expand to cover all 4 years. Aligned with Pre-Clerkship curricula and integrating Clerkship and Post-Clerkship students into sessions will reinforce clinical skills, peer teaching and teamwork, professionalism, ethical principles, and wellness. Curricular enhancement based on student and faculty feedback is integral, and faculty development programs are being designed and implemented based on these also.

The Longitudinal Outpatient and Orientation Clerkship (LOOC) is a new longitudinal ambulatory care program launched in 2015, designed to provide students early clinical experience and opportunities to develop and demonstrate clinical competencies. A small group of students entered the pilot program, with plans to expand in the coming months. Preceptors (UTSW and community) are essential for successful expansion and clinical curricular implementation.

Team-Based Learning (TBL)

TBL, developed in the 1970s, has been adapted to medical education more recently, part of a shift away from lecture-based and problem-based learning. It has demonstrating utility to enhance student performance,²³ and students view team learning more favorably.²⁴ TBL is increasingly utilized in UTSW Pre-Clerkship period, with student teams remaining constant throughout, and forms of team learning are being introduced into Clerkship curricula. TBL calls for student self-preparation (pre-reading assignments), assessment (Individual Readiness Assessment Test and Group Readiness Assessment Test), peer evaluation, and group application. Students are responsible for individual and group learning, and faculty teachers are facilitators, not lecturers, making class time more efficient. (also see: www.teambasedlearning.org)

TBL is one way to implement a “flipped classroom,” and an alternative to the lecture-based traditional teaching model. McLaughlin, et al, offer a compelling model of a flipped classroom. Their framework included pre-class self-paced and interactive web-based modules (with videos) and assigned readings (“off-loading” content), in-class learner-centered and faculty-facilitated active activities, with reflective assignments and group applications and presentations. Various learning assessments (exams, quizzes, presentations) were used, and real-time feedback on group activities integral to in-class learning and formative assessment.²⁵

Bridging the Generational Gap: UT-PACT

The UT Partnership in Advancing Clinical Transition (UT-PACT, established 2012), is an innovative BA/MD program between UT Dallas and UTSW, which accelerates undergraduate

curriculum and offers early clinical education for select Texas students (20 per class) provisionally accepted to UTSW. As noted, it is one part of the UT System's TIME initiative. UT-PACT leads the way by having matriculated its first two cohorts into medical school.

UT-PACT students are highly achieving Texas high school standouts that have also demonstrated dedicated volunteerism within health care settings. Admission standards are very high, and both UT Dallas and UTSW faculty interview students while still in high school. Our program operates through the Office of Medical Education, directly overseen by Dr. Dorothy Sendelbach, Assistant Dean of Undergraduate Medical Education.

Students take Summer 1 and Summer 2, intensive introductory clinical courses on UTSW campus, after their first and second years of college, respectively. Led by Dr. Sendelbach, these focus on early, broad clinical exposure (shadowing), and small group sessions on clinical skills, including professionalism, communication and motivational interviewing. Students get their first standardized patient experience here, and utilize a clinical encounter simulation program created at UT Dallas. I took on the course directorship position in 2014 to develop and implement the UT-PACT 3rd year (of college) clinical medicine curriculum. Dr. Heidi Román and Dr. Anu Partap (both in UTSW pediatrics), joined in co-directorship in Spring 2016, and Dr. Stephanie Brinker (Internal Medicine) currently takes over my position.

We focus on clinical immersion and a Colleges-like learning community. Small group discussion sessions and longitudinal clinic preceptorship/mentorship experiences serve as the course foundation for learning and assessing competencies and professionalism. We emphasize early clinical experience, communication and physical exam skills (standardized patient interviews with immediate feedback, active-learning preceptorships), professionalism, sociocultural competency, and student wellness. Large group and team-based learning activities are often led by guest facilitators, and have included a variety of topics such as research ethics (Dr. Ami DeWaters), social media in medicine (Dr. Ami DeWaters), STIs (Dr. Yvonne Covin), alcoholism (Dr. Lindsey Pershern), unconscious bias (Dr. Shawna Nesbitt), and medical humanities (Dr. Claudia DeShay). Small group sessions reinforce clinical topics (outpatient management of acute and chronic disease, prevention and health maintenance, and evaluation of the medical *and* psychosocial *and* cultural dimensions of patient care) through student-led teaching and discussions of actual clinical experiences. We maintain ample opportunities for reflection and student creativity. Study skills sessions with Dr. Arlene Sachs, and inter-professional sessions with the UTSW School of Health Professions (Physician Assistant Studies) are being phased in.

Technological initiatives include 1) use of a virtual clinical simulation program, developed by UT Dallas Arts and Technology department, during Summer 2; 2) team simulations utilizing a high-fidelity mannequin in the UTSW Sim Center; 3) a closed Facebook page for distribution of educational material and discussion on social media; 4) web-based curriculum with posted reading materials; 5) emphasis on appropriate use of social media and mobile technology in clinical education and clinical settings.

Bridging the Generational Gap: Ambulatory Care Clerkship

The Ambulatory Care Clerkship is the newest required clerkship at UTSW, launched in 7/2016. It combines previously established pediatric and internal medicine clerkship ambulatory rotations into a single 6-week-long clerkship. I co-direct this clerkship with Dr. Heidi Román. We have just completed our first rotation block.

Our initial objectives for the Ambulatory Care Clerkship experience included:

- Be student-centered, focused on meaningful student educational experiences, and on student reflection and wellness.
- Build on what works from prior ambulatory curricula, strive to improve clinic experiences
- Innovate in curricular design and implementation, and continuously improve through faculty and student feedback.
- Focus on quality/depth of clinical experiences over quantity.
- Active participation of students in clinics, not just observation.
- Demonstrate clinical competencies, especially in communication, direct patient care, practice based improvement, and professionalism.
- Team learning and student-led discussions.
- Community health, and experiences within local communities.
- Psychosocial and cultural dimensions of patient-centered care.
- Substantive experiences in both private practices and indigent health care.
- Prevention, motivational interviewing and behavioral change, shared decision-making.
- Acute and chronic management of patients across the entire age spectrum.
- Develop novel ways to integrate adult and pediatric clinical education.
- Utilize social media (Facebook and Twitter) to engage students and reinforce learning.
- Highlight a variety of specialties and ambulatory settings for students (including Dallas County Jail and Parkland's Homeless Outreach Medical Services), while emphasizing primary care as a viable career path.

Our didactic sessions, TBLs and interactive group sessions (5 groups of same composition throughout) with guest facilitators, have included Obesity, Nutrition (Dr. Jaclyn Albin), Smoking Cessation (Dr. David Balis), Motivational Interviewing (developed by Dr. Heather Wainstein and Dr. Blake Barker), Mood Disorders (Dr. Julianna Fort and Dr. Laura Lamminen), Health Literacy (Dr. Claudia DeShay), Diabetes Types 1 (Dr. Soumya Adhikari) and 2, Geriatrics (Dr. Melanie Zuo), Growth & Development (Dr. Anne-Marie Hain), Dermatology (Dr. Heather Wickless), Congenital Heart Disease (Dr. Beth Brickner), and Cystic Fibrosis (Dr. David Finklea). In teams, students present and teach on common ambulatory care topics (screening guidelines, URIs, etc.), and take part in prepared debate sessions on controversial topics (e-cigarettes, physician professionalism on social media, vaccine hesitation, telemedicine, physician's "gaming" transplantation rules for their patients). Individually, they submit a researched, reflective write-up on a patient followed longitudinally during the clerkship (visits, chart reviews, follow-up calls, etc.), and ultimately present on a health care topic of interest relating to their patient (creative, reflective, mini-TED talk style). Like UT-PACT, medical humanities are emphasized. Students and all faculty preceptors are invited to share or recommend literary works.

Wellness is a strong theme throughout the clerkship. Dr. Wiles leads an interactive session on resiliency and student mental health early on, building on sessions given during the Pre-Clerkship period. Dr. Jaclyn Albin and Dr. Heidi Román lead a cooking/meal preparation class to reinforce healthy food choices for students. Students are encouraged to exercise, especially in group settings – in this block, several of us (including both directors) participated in a spinning class led by one of our students. Biking, dancing and kickboxing were also suggested in class and through social media.

Plans in progress:

- Individualizing clinical experiences based on student preferences.
- Expanding jail health care and homeless health care opportunities.

- Recruiting community preceptors, including Parkland COPC and Texas Health Resources.
- Faculty development sessions on preceptorships and mentoring.
- Determination of methods to evaluate clinical competencies.
- Online curriculum modules.
- Incorporation of student quality improvement and patient safety projects.
- Inter-professional education, including sessions with health professions or nursing students.
- Student involvement in transitions of care teams/projects at PMH and CUH.

MENTORSHIP AND PRECEPTORSHIP

These are essential to UT-PACT, Colleges, LOOC, and the Ambulatory Care Clerkship. Expanding and integrating longitudinal clinic experiences across these curricula may be feasible *if* enough dedicated preceptors/educators can be recruited. Other curricula not described here also utilize preceptors, and demand is increasing. We need excellent, highly motivated preceptors willing to teach and involve students directly in patient care. They should also be willing to sustain a mentoring relationship.

Overall lessons learned here: As we expect students to become competent in clinical skills, then we must demonstrate competency and proficiency in clinical skills. As we expect students to demonstrate professionalism and life-long learning, then we must model professionalism and life-long learning. As we expect students to show creativity, then we must be creative. As we expect students to self-reflect and practice wellness, then we need to consistently reflect and practice wellness. We must be excellent role models if we hope to improve medical education.

Lack of educator engagement in student education, with lack of clear expectations and communication, may contribute to student disengagement. Worse, student disengagement may be a manifestation of burnout and emotional health problems, but we may be missing this by attributing it to “being a Millennial.” Indifference can also be associated with mistreatment. Fourth-year medical students in a Penn State humanities elective created comics to reflect on their medical training, and since 2009, 47% of these comics have contained horrific imagery. According to the authors, physicians were often seen as “fiendish, foul-mouthed monsters,” and students depicted themselves as “sleep deprived zombies walking through barren post-apocalyptic landscapes.”²⁶ In a systematic review published in *JAMA* 2015, the estimated prevalence of depression or depressive symptoms among residents was 28.8%.²⁷ While many systemic factors may contribute to these troubling findings spanning medical education, undergraduate medical education reform undoubtedly plays a role in finding solutions, and this includes effective mentoring.

FINAL LESSONS IN CURRICULAR DEVELOPMENT (WITH MILLENNIALS IN MIND)

- Mentor. Take time to talk to and listen to students. Involve other mentors.
- Be accessible and connect with students outside of class, in individual meetings, or on social media in educational groups.
- Role model clinical excellence, professionalism, and lifelong learning.
- Make it practical and infuse all didactics with real-world applications.
- Allow for longitudinal, active learning in clinical settings, in the contexts of real patients.
- Have clear objectives and expectations (including absence requests, smart phones, etc.)

- Allow flexibility and creativity in completing objectives, including self-directed learning.
- Work in teams, use TBL, and have teams creatively produce new educational content.
- Give immediate feedback (such as right after a patient encounter, or presentation, or as you read a progress note or write-up).
- Learn from students; learn *with* students. Let them lead didactic sessions.
- Allow use of phones and devices to enhance education. Use new educational technologies, but do not minimize face to face interaction and human emotion.
- Allow students to have input on course content and implementation.
- Be nimble and ready to integrate new material, new technology, and group preferences.
- Incorporate best practices, and feedback from students and other faculty – your own great ideas will not always work.
- Allow students to reflect on clinical experiences, in creative ways (not just narrative).
- Include wellness throughout, beyond dedicated wellness sessions.
- Make room for humanities and explore arts and literature, with a lot of student input.
- Create a supportive, engaging learning environment that always takes student preferences and needs into consideration.
- Always have high expectations.

CONCLUSIONS

Change in medical education must account for characteristics and learning preferences of Millennials, and Millennials must also adapt to demanding, evolving medical curricula still led by older generations. Understanding should be mutual: older generations should try to understand Millennials in the contexts outlined here, trying to avoid stereotyping every Millennial they encounter, and Millennials should also understand older generations, and the contexts (historical, modern) of change in medical education. We will be working together in multi-generational health care teams, and must do so effectively for patient safety and outcomes. Bridging generation gaps will require multifaceted and multi-generational approaches.

There are many ways to pursue innovation to engage Millennials, and some are outlined in this document. Common themes/approaches are student-centeredness and individualization of curricular pathways, teamwork, embracing technology, early clinical experience, and evaluating clinical competencies. These align well with general Millennial preferences in theory, but questions on best practices, learning outcomes, and patient outcomes remain. We must research these issues, and continuously refine curricula to provide meaningful educational experiences throughout medical school and strengthen foundations for assessing competencies and EPAs (including digital professionalism). We must equip Millennial medical students with skill sets needed to confront challenges in modern health care. We must also address faculty development, change in premedical and graduate medical education, and incorporate topics in mental health, resiliency, burnout, and work-life balance throughout. I believe UTSW will remain at the forefront of innovation.

What a time to be alive? Definitely. This will mean different things to different people. To me, in the context of Millennials and innovation in medical education, this evokes excitement, awe and admiration. I hope this inspires you, too, and that together we can find new ways to contribute to the education of our next generation of physicians. Personally, I'm making more time to listen to works by Drake, a Millennial inspiring his generation, to broaden my pop culture knowledge and to impress my Millennial students for years to come.

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