What We Don't Know We Are Teaching

Unveiling the Hidden Curriculum

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In addition to the intentional teaching of knowledge and skills by surgeons to their trainees and protégés is the unintended, often unrealized transmission of implicit beliefs, attitudes, and behaviors through a process called the hidden curriculum. The hidden curriculum is a function of implicit values held by the institution as a whole, and the individual surgical educators and allied health professionals working in the trainee's learning environment. It has been argued the hidden curriculum plays a central role in the development of professionalism, but it may also play an important role in inadvertently deterring good candidates from considering orthopaedic surgery as a career. We review the importance of attending to the messages we transmit to our trainees, protégés, and junior colleagues as we strive to develop professional competency and recruit the best into the field.

The teaching of surgery has formalized dramatically over the last century. Once governed by a culture of situated mentorship, which involved the wise and judicious imparting of relevant knowledge, skills, values, and attitudes by a senior surgeon in the course of daily practice, surgical training programs have increasingly been driven towards the development of structured educational activities with explicit learning objectives and quantifiable outcomes. Motivated at least in part by the sense there is more and more to teach in less and less time, programs have moved towards models of educational efficiency, including the use of classroom-based seminars to teach knowledge, and lab-based skills courses to teach technique. Compounding this movement are several political factors. For example,

professional governing bodies in North America, such as the Association of American Medical Colleges (AAMC), the Accreditation Council for Graduate Medical Education (ACGME), the College of Family Physicians of Canada (CFPC), and the Royal College of Physicians and Surgeons of Canada (RCPSC), have moved from process-oriented accreditation standards to outcome-oriented accreditation standards, thereby accentuating the formal teaching of what can be officially evaluated. And as new competencies are added to the list of accreditation expectations, the reflexive response of many programs has been to insert additional formal seminars into an already disjointed and overburdened curriculum.

As Hafferty[23] has pointed out, however, medical training is a multi-dimensional learning environment, and the formal curriculum of the classroom setting can never fully replace the informal curriculum of the clinical setting. This informal curriculum is the process by which a learner's knowledge and skills become situated in the context of daily work. It is not structured but is opportunistic, with appropriate lessons being offered when appropriate learning opportunities arise. It is not formulaic but is individualized, a very personal interaction between a teacher and a learner. And it is not abstract, but is specifically relevant to the particular activity in which the learner is engaging or the particular problem with which the learner is struggling at the time. The informal curriculum is vital to clinical education. It is the mechanism by which the wisdom of clinical practice is imparted and a trainee's abstract knowledge and skills are commuted to practical clinical functionality.

As with the formal curriculum, however, the informal curriculum involves the intentional imparting of information from the teacher to the learner. It is an explicit effort to impart what the teacher thinks the learner needs to know. But in addition to the knowledge and skills we intend to convey, we also transmit to the learner a vast array of behaviors, beliefs, and attitudes we never intended to share, nor even recognized we were imparting. Separate from but commingled with the formal and informal curricula, these unintended transmissions of implicit social

and cultural rules and regulations occur as part of a third curriculum; Philip Jackson termed it the hidden curriculum.[32] Jackson coined this term in 1968, arguing that for pupils to succeed within the school system they must not only learn to conform to the formal rules of the school, but also the informal rules, beliefs and attitudes perpetuated through the socialization process.[32] Applying this concept to the context of medicine, Hafferty suggested the hidden curriculum is based in "... the commonly held understandings, customs, rituals, and taken-for-granted aspects ..." of what goes on in medicine.[23] For example, implicit but important messages about what is valued by the institutional community are conveyed by phenomena such as institutional policy development, resource allocation, slang, documentation and evaluation.[23] As Hafferty eloquently stated,

> "... although matters of technical information and the transmission of technical skills traditionally have been thought to lie at the heart of the medical education system, medical training is a process of moral enculturation, and ... in training normative rules regarding behavior and emotions to its trainees, the medical school functions as a moral community."[25]

The hidden curriculum is a function not only of the institution's implicitly held values, but perhaps more so of the individuals by whom the trainee is surrounded personally. Again, Hafferty has described this phenomenon explicitly in his statement, "Stories, jokes, and personal anecdotes, whether told by faculty or fellow students, all function as part of the oral culture of medical training and thus as an influential part of the educational process."[24,25] In the psychological literature, role modeling has long been recognized as a powerful influence on a person's behavior[2] and values.[29] And Albert Schweitzer's famous quote, "Example is not the main thing in influencing others, it is the only thing," is as true in medical education as anywhere else. Trainees and junior colleagues rapidly learn the rules of appropriate and effective behavior by watching those with influence.[33] Unfortunately, it is also well established that protégés pick up not only a role model's professional behaviors, but also their bad habits, inappropriate behaviors, and questionable attitudes.[3,44]

Thus, we are teaching far more than we know. Every word we speak, every action we perform, every time we choose not to speak or act, every smile, every curse, every sigh, is a lesson in the hidden curriculum. Perhaps the best documented effect of these hidden lessons in the medical education literature has centered on the development of medical professionalism. Thus, in the first part of this paper we will review literature to highlight the importance of attending to the messages we transmit to our trainees, protégés, and junior colleagues as we strive to nurture the development of medical morality and professional competency in our trainees.

It is important to recognize, however, these hidden lessons are also being learned by those who are trying to decide whether to be our trainees, protégés, and junior colleagues. During the process of selecting a future specialty path, today's medical students place important weight on lifestyle factors, professional flexibility, and job satisfaction, factors often not perceived to be compatible with a surgical career.[37] Similarly, physicians are turning away from academia because of persistent social and promotional inequities.[6] Many of their perceptions and misperceptions of the surgical and academic lifestyle are likely, unknowingly, transmitted through the omnipresent hidden curriculum of surgical culture through our day-to-day conversations, choices, and actions. In short, the hidden curriculum may also be playing a central role in the observed declining interest in many of the surgical specialties and in academic medicine generally. While the potential negative impact of the hidden curriculum on recruitment may be applicable to any number of specialties, it is likely of particular importance to orthopaedics. It is the surgical specialties,[16,43] including orthopaedics,[27] that have noted the relative decline in application rates. The percentage of women in orthopaedic surgery training programs is lower than every other primary surgical field, and orthopaedic surgery trails only thoracics in its inability to convince the rising proportion of female medical students to consider the specialty as a future career option.[7] The role that surgical educators within this field may be playing in inadvertently perpetuating negative stereotypes and misperceptions, or failing to adequately endorse the positive aspects of the specialty to today's more discerning medical student needs to be considered. Thus, in the second part of this paper we will highlight how, through the hidden curriculum, surgical educators may be inadvertently undermining their own efforts to recruit the best into the field.

The Hidden Curriculum of Professionalism

"A profession is by definition, a public trust ..."[28] and each profession ensures this trust by maintaining an ethical code more stringent than society's legal code.[38] As long as a profession enforces its code effectively, society will continue to grant the profession autonomy. Medicine has historically fulfilled many of the aspects of this idealized definition and in return society has granted its practitioners considerable professional autonomy.[36] However, pressures such as managed care, economic constraint, increased patient volume, and changing societal expectations have strained our ability to meet these ideals. The presence of this strain on professionalism and its implica-

tions for the profession were not missed by the North American credentialing bodies (AAMC, ACGME, MCC, RCPSC, and CFPC). In response, these bodies revised accreditation standards to include requirements regarding the teaching and learning of ethical, behavioral, and socioeconomic subjects relevant to the practice of medicine. Undergraduate programs responded quickly with the inclusion of some form of biomedical ethics training. However, it has been questioned whether the inclusion of specific curricular instruction or evaluation is truly effective in advancing the attributes of professionalism.[9,25] And, consistent with this doubt, the inclusion of specific biomedical ethics programs does not appear to have inspired students to become better, more socially responsible physicians.[13] In fact, if anything, medical training across the undergraduate program has been marked by an erosion of professional attitudes among students.[17,18,39,40,42,52] If we are selecting upstanding individuals into medicine, providing ethical biomedical training, and surgical educators purport to teach professional values, when and where are these contrary values being taught?

Consistent with Jackson's concept of the hidden curriculum, Hafferty and Franks argue professionalism is unlikely to be acquired through the brief, often abstract description of medical culture students are exposed to in a formal curriculum.[25] Similarly, Hilton has argued, "No matter how much we write about professionalism's importance, or plan its inclusion into postgraduate curricula, it is the day-to-day experience of working within a clinical environment that will be most influential in its development."[30]

In short, the knowledge of ethics transmitted through classroom discussion alone cannot be expected to guarantee the virtues society or the profession should expect of a surgeon. Rather, Hilton's statement represents the evolving opinion of many medical educators that the informal and hidden curricula are central to the development of professionalism. Unfortunately, the concept and importance of the hidden curriculum is not well understood by the medical community at large. In a recent study, medical school administrators cited not only role models (82%), but also coursework (66%) and freshman orientation (59%) as the three main influences on their students' development of high professional standards.[5] Hafferty and Franks charge these administrators may be expecting a great deal from ". . . formal instruction that occupies a marginal presence in the training structure . . ." and ". . . a set of brief and often ritual experiences."[25] While Hafferty and Franks admit their comments are intentionally inflammatory,[25] they may not be far from the truth. There is little evidence to suggest the rituals of medical orientation contribute in any meaningful way to the development of ethical values, and some have argued it may result in an undesired attitude of student entitlement.[41] Additionally,

Stern has demonstrated the majority of teaching of values occurs in the hidden curriculum.[44]

With respect to role modeling, our trainees are exposed to nonprofessional situations more commonly than we might like to admit. A recent survey of six medical schools revealed 98% of students reported hearing physicians speak in a derogatory manner about their patients while on the wards and 61% of students reported seeing team members engage in behavior the students deemed as unethical.[18] Dewitt et al showed residents observed similar high rates of unethical behavior and 29% of residents stated they had been required to do something immoral, unethical, or personally unacceptable during their first year of training.[1] These findings are consistent with Stern's finding medical educators are not consistently modeling the recommended values of the profession,[45] and Cooper's admonishment, "Too often, our students and residents learn unprofessional behaviors from us, their teachers, house officers, attending physicians and mentors."[12] Hence, it is not surprising students and residents training in an overworked environment and presented with discordant messages fail to demonstrate our ideals of professionalism.

Educators have always considered education as more than the simple transfer of knowledge. Rather it is a socialization process, quietly transferring social norms and values to the student.[32] As described earlier, Hafferty has extended this recognition to medical education, challenging medical educators to consider their training institutions as ". . . cultural identities and moral communities . . ." involved in constructing definitions of what is ". . . good and bad in medicine . . .", or more specifically, definitions of what constitutes appropriate and inappropriate attitudes and behaviors.[23,25] Attributing such an identity or personality to an institution or an environment implies its culture can be modified. As surgical educators, we should strive to resolve the dissonance between the formal and nonformal surgical curricula if we hope to attain our, and society's, expectations of the ideal surgeon. However, particularly for the student, the institution's values are embodied in their direct supervisor and senior trainees. Thus, the challenge we are faced with as surgical educators is to step back and look at what messages we as individuals are unintentionally transferring, and what the implication of these messages are on the professional development of our future surgeons.

The Hidden Curriculum of Orthopaedics as a Profession

Medicine's interest in the hidden curriculum initially evolved around its implications for the development of professional ethics. However, while it is important the values transmitted by the hidden curriculum are congruent

with our expectations of the professional physician, the effects of this curriculum likely extend beyond trainees' adoption of the professional competencies. The hidden curriculum's messages are likely also central in the perpetuation of the perceived culture and positive and negative stereotypes of orthopaedic surgery as a profession. In a time when we search for reasons why interest in the specialty is declining, it might be helpful to consider the importance of what we are not meaning to teach in developing and maintaining interest in the specialty. It is worth examining, therefore, the role of the hidden curriculum in defining the perceptions of orthopaedic surgery in the minds of medical students making specialty selections.

Orthopaedic surgeons choose orthopaedic surgery as a career because, for one reason or another, they love it. While there are certainly days where one might question this love, and moments when the demands of increasing workload, social expectations, and managed care challenge the immediate sense of joy, overall there continue to be good reasons to pursue the calling. In fact, relative to most surgical subspecialties, orthopaedic surgeons are more likely to be satisfied with their careers.[34] Despite this, there is a clear perception among candidates making specialty selections that surgeons are unhappy with their careers. Several studies have shown candidates believe the surgical lifestyle to be incompatible with a rewarding family life, a happy marriage, or raising children.[37] This certainly is not being taught as part of the formal curriculum, so we might ask where this misperception is being created.

Certainly there are a number of variables leading to this misperception. However, it is important to consider the possibility it is, at least in part, unwittingly transmitted by surgeons themselves in their day-to-day comments and activities. As a personal challenge, try spending a week listening to yourself as you work through your days. Consider how many times you complain in front of your student or resident about how big your clinic is, how many patients you must round on, how there is too much on your emergency list, how you have to stay late for yet another meaningless committee meeting, how many charts you have to dictate, how another research deadline is looming, or generally how bad a day it was. Now consider how many times in front of those same individuals you mention how satisfying it is to see your patients in clinic improving, how you feel like you are helping make a difference in their lives, how proud and pleased you are by your management of a particularly complicated case, how excited you are by a research finding in your lab, how you are leaving early to watch your kid's game, or generally how great a day it was. Most of us, on a day-to-day basis, tend to verbalize the negative aspects of our job in the form of conversation we call recreational complaining.

Within the academic community at least, the default, meaningless response to the question, "How are you?" has evolved from an unreflective, "Fine, thanks," to a curt, "Busy." With our medical students and residents only hearing the negative aspects of our jobs, how can we expect them to be interested in our specialty or subspecialty?

The hidden curriculum may play an even greater role in deterring the female candidates from considering the specialty. Over the last 30 years there has been a dramatic increase in the proportion of women in undergraduate medical programs in North America.[8] However, a parallel shift towards gender parity has not been observed in the surgical specialties, especially orthopaedic surgery, which has demonstrated only an 8% increase in female residents.[7] There are a variety of factors contributing to this lack of gender parity, many of which can be attributed to messages in the hidden curriculum. Certainly the lack of women in substantial academic leadership positions[6] and the delayed progression of women through the academic ranks[49] sends a message to any female considering a career in academic surgery. The lack of these female leaders contributes to the difficulty female candidates have in identifying same-gender role models and mentors.[4,37] Female medical students tend to base specialty choice more on lifestyle factors[4] and flexibility for future parental leave, and most female candidates do not see surgery as a place where these issues can be addressed.[37] The lack of female mentors to correct this misperception and the inflexibility of programs to consider the specific needs of women also sends a message the surgical lifestyle may not be compatible with their future plans. Finally, a major factor deterring women from considering surgical careers is the gender discrimination and sexual discrimination they encounter during the preclinical and clinical surgical rotations.[4,35,37,47] Stratton et al showed direct or indirect exposure is 2.2 times more likely to affect a women's specialty selection and 1.8 times more likely to affect their program selection.[47] Thus, the evidence suggests those deterred from surgery are often deterred by misperceptions regarding lifestyle, a lack of available role models, and exposure to direct or indirect gender discrimination, all of which are a result of a pervasive message transmitted by the hidden curriculum in the surgical specialties.

Of course, the issue of actual rising dissatisfaction within the profession should not be overlooked.[10,14] Increasing physician dissatisfaction has public health implications in addition to the "obvious problems of recruiting new members into a troubled profession".[54] Although Zuger[54] argues this dissatisfaction is a result of multiple factors, restrictive managed care is routinely cited as a major reason for the rising dissatisfaction of physicians in the United States.[14,22,46] This begs the question, if the factors such as managed care are increasing dissatisfaction

and thereby compromising the learning environment, just what may be the potential 'hidden' costs associated with the perceived savings of managed care? What effect does this increasing level of physician dissatisfaction have on medical education, the perpetuation or magnification of dissatisfaction in future physicians, or future medical school application rates? This may be a critical issue for future research and organized response from the medical community. Our point for this paper, however, is that the individual educator needs to be aware of the sources of pressure within the working environment, and ensure these are appropriately presented to the trainee as a reality of the job, but also contextualized in the larger picture of a career that offers many positive and rewarding experiences. As Zuger states, the "key to restoring a sense of contentment to the medical profession may lie in the hands of educators who encourage students to have more accurate expectations of a medical career".[54]

Finally, it is worth acknowledging the simple fact people tend to like those who show a liking for them and tend to respect those who show respect for them. People aspire to be like those who they like and respect. These are not particularly surprising facts, yet they are vital for understanding medical students' career decisions. In the medical field, career decisions are made relatively early in a student's training. Thus, it is when they are students that one can set their feet on a path to surgical training or on the path elsewhere. One's attitude and approach to students, therefore, has a massive influence on who will be our colleagues in the future. Global policies often adopted by surgeons, such as "My fellows, our residents, your students" are not lost on the students, and affect their desire to ever become your fellows.

In general, then, it is vital for members of the surgical academic community to recognize the attitudes, beliefs, and values implicit in every action, every word, every inaction, and every silence are not only shaping the attitudes, beliefs, and values of one's protégés, but also are shaping the decisions of students who are considering the possibility of becoming one's protégés. Thus, as each of us works through the day, we must be constantly mindful of the image we are projecting, not only of ourselves as a professional, but also of ourselves as a career person. On a day-to-day basis, listen to the way you project yourself and present your job to those around you and ask yourself, "What am I teaching students about what it is like to be me and why would someone else want to do what I do?" This does not mean one must be disingenuous in one's self-presentation. As Friedman and Lobel have demonstrated in the context of business management, "happy workaholics," can help their protégés to realize their own professional goals and their own set of priorities in their personal lives.[20] It is a matter not of having exactly the same

set of priorities, but showing respect for others' priorities. Happy workaholics serve as role models not for balance in the usual sense but, rather, for authenticity. In a similar way, showing frustration for certain aspects of one's job is not inappropriate, but this too must be balanced with an effort to express the pleasure and fulfillment one gets on a daily basis from doing a job well. It is only through such authentic activities the lessons of the hidden curriculum will create an inviting atmosphere for the next generation of potential orthopaedic surgeons.

Aligning the Hidden Curriculum with the Formal Curriculum

Initial efforts to improve training programs or meet new accreditation standards often result in the supplementation or addition of course material. This limited response is far easier than the challenge of examining and modifying the full range of influences arising from all three forms of curricula (formal, informal, and hidden) in an attempt to redesign the learning environment.[23] If we truly hope to improve more than just the coursework in our training programs, then change in the culture of our learning environments is required. To achieve this, we must each assess our training environment to identify the values transmitted by the hidden curriculum in our institution. If these values do not parallel the formal curriculum, we must ask why and implement change. The majority of the literature discussing the hidden curriculum relates to its role in the development of ethics and professionalism. While it is clearly important to focus on this link, it is also important not to overlook the role this hidden curriculum may play in deterring good-quality candidates from considering orthopaedic surgery as a career path. To modify the culture of our learning environment in a direction that ensures the development of professional values in trainees and encourages good-quality candidates to pursue orthopaedic surgery as a career, change will have to occur at the level of the profession and specialty, the institution itself, the program, and the individual educator.

At the level of the profession and specialty, we first need to outline clearly our ideals of professional practice and then select appropriate assessment and accreditation processes to ensure these ideals are realized. Too often good intention is ". . . neutralized by the powerful steering effect of a traditional assessment system . . .",[21] resulting in the generation of a hidden curriculum subverting the intentions of the declared curriculum.[26] To avoid this, the accreditation process needs to acknowledge the presence of a nonformal curriculum and consider it in the evaluation of programs.[31] Hafferty views the movement towards competency-based assessment programs as an extremely positive step towards avoiding this problem, stating competency-based assessment at the level of the program has

the ". . . potential to emphasize organization structure and interpersonal interaction over curricula."[23]

At the level of the institution (university and hospital) and department, policies can clearly demonstrate what is important in the organization. Therefore, it is essential policies are frequently reassessed to ensure their implicit message parallels the institution's goals and directives. Obviously, as social values change so should institutional policies. However, in some cases, it is the responsibility of the institution to take the lead and change policy to effect change in the local culture. This was powerfully demonstrated recently by the Johns Hopkins Department of Medicine where a program to eliminate gender-based obstacles to women generated a remarkable 183% increase in the proportion of women expecting to remain in academic medicine and an unexpected 57% increase in the proportion of men expected to remain.[19] Through a strong leadership mandate and policy change, the hidden curriculum was modified to more closely meet the needs of all faculty, resulting in a substantial increase in staff retention and interest in joining faculty. The trickledown implications for attracting residents and students to the specialties have not been formally examined to our knowledge, but the potential implications are compelling.

Institutional policies recognizing teaching and mentoring as a professional activity like any other academic activity will additionally facilitate alignment of the hidden curriculum with the formal curriculum. We have previously discussed the pivotal role mentoring has in optimizing the learning environment. Institutions supporting equality in remuneration, awards, and promotion for teaching activities and institutions ensuring time is protected for this activity will clearly demonstrate to their faculty and students its importance in the learning environment. These policies would allow for faculty to direct their time and energy towards this task and towards improving their skills in this area. This should translate into greater student interest in an institution or specialty because the availability and quality of role models and the quality of teaching are often generally cited as important student decision factors.[4,37,53]

A variety of changes can also be made at the level of the program to ensure the hidden curriculum is consistent with attracting high-quality candidates and producing the ideal trainee. As mentioned earlier, with the increasing proportion of female medical students, programs need to be cognizant and accepting of their specific needs and aspirations. Interestingly, while lifestyle factors in specialty selection have traditionally been considered typical female considerations, several recent studies have demonstrated men may also be placing greater weight on these factors.[15,51] Therefore, programs proactive in resolving gender inequities may also have the advantage of restoring male interest in the fields. Programs ensuring teaching occurs during regular working hours and programs controlling resident work hours and work load will also clearly show an interest in protecting their trainee's lifestyle. Programs need to ensure gender parity in training and consider increasing flexibility to meet the parental leave and family requirements of today's trainee.

Aside from these changes in policy, programs must consider the role of their faculty in transmitting a hidden curriculum. Actions speak louder than words; we can't expect our trainees to excel or students to be interested in our program if we ignore them or model failure before them. Programs need to inform their faculty about their pivotal role in transmitting a hidden curriculum, train them to be more effective teachers, and support the importance of the learning environment by protecting faculty time to pursue these endeavors.

Ultimately, it is the frontline clinician and educator who will have the pivotal job of projecting the ideal behaviors of the professional and the positive aspects of the specialty. In addition to modeling appropriate behavior, we must ensure we identify and pass on the experiences of the ethical issues we confront each day. Like any skill, only by sharing the recognition of the problem, the decision reached and, more importantly, the reasoning leading to this decision can we expect our students to be able to understand, interpret, and replicate this behavior.[25] We must also provide a safe environment for our students to question our decisions,[18] so we can both learn from these experiences. By such processes we can move some of the hidden curriculum inferred by our trainees into the informal curriculum, thereby increasing the likelihood the trainees will learn what we intend.

Also, as faculty we must consider how inviting the individual working environment we create is, and how the working environment we create affects those around us. While it is important to create an enjoyable environment, we must ensure it is appropriate and inclusive. As we have mentioned, if we want others to be interested enough in what we do to consider it as a career we must clearly demonstrate our interest in what we do on a day-to-day basis. Most of us have a tendency to fixate on and vocalize the negative aspects of our daily activities at the expense of expressing the positive aspects. This is not to say we should feign enjoyment or hide our day-to-day difficulties. All working environments have negative aspects and avoiding teaching prospective students and residents about these aspects would be a disservice. However, we must strive to ensure there is balance and a true representation of what is positive and negative about our jobs. Finally, regardless of workload and stress, we must continuously focus on the patient and the students if we are to achieve our bipartite mission. As James Strickland reminds us,

take the time to enjoy life and focus on the patient[48] (and we would add the student). The goals of modeling professionalism and attracting students to the specialty will flow from this.

When considering the role we as faculty play in attracting future candidates to the specialty, we must also remember a great deal of a medical student's time is spent with the resident. Stern showed attending physicians were present for less than half of the values teaching events in the nonformal curriculum.[44] While it is unclear whether the teachings from residents in the nonformal curriculum have a greater or lesser potency than the infrequent values teaching of attendings,[44] surgical educators must ensure the messages being transmitted by the residents are consistent with the messages we hope to transmit. To achieve this, faculty members must first ensure they are presenting an appropriate message to the residents. As with the attending staff, it is important the residents are aware their values and actions are closely observed and incorporated by students. The work environment must not be overburdened, as untenable work situations may foster diminished ethical standards.[11,18] This may be accomplished by ensuring reasonable work hours, reduced hierarchical-based work structure, and an environment where it is ". . . both safe and acceptable for students to challenge team members about the ethical implications of various courses of action".[18]

The essence of our message is simple. Actions speak volumes, and students' perceptions of one's values are likely to be quickly incorporated in the enculturation process of medical training. It is therefore the obligation of surgical educators to ensure their values and the messages they are transmitting are consistent with the ideals of the profession, specialty, and program. It is also our obligation to look beyond our own values and ensure the culture of our institutions, and thus the hidden curriculum, is appropriate and parallels the formal curriculum. Achieving this will be essential in attracting high-quality candidates to the specialty and producing the excellence and professionalism in our trainee's society expects and deserves.

DISCUSSION

Medical and surgical training is more than acquiring a technical knowledge base; it is a socialization process whereby trainees acquire the skills and humanistic qualities society expects of its physicians. The hidden curriculum describes a set of influences, defined by the organizational culture and enacted by the members of the organization, which shape the attitudes and values of the trainee. This curriculum plays a more important role than the formal curriculum in transmitting the values, ideals, and conditions of the profession and specialty. To attract the highest-quality candidates to our specialty and produce truly professional trainees we must ensure the hidden curriculum actually transmits these ideals and parallels the formal curriculum.

To achieve the goal of curricular alignment, and hopefully thereby ensure the continued interest of high quality candidates, we must better define contributing factors to the hidden curriculum within the domain of orthopaedic surgery. This will require the assessment of specialty specific, site specific and supervisor specific factors. We have argued that physician dissatisfaction is likely transmitted to the student and may ultimately affect specialty choice. Only by identifying the factors that contribute to dissatisfaction among orthopaedic surgery educators, and the degree to which these have an impact on the orthopaedic education environment, can efforts be appropriately directed toward reversing this trend. We also theorized that "recreational complaining" within the specialty may play a role in deterring candidates but the validity and significance of this concept await empirical evidence. Factors already known to affect specialty choice, such as gender inequity, need to be further evaluated within our specialty. While Tosi et al. made a commendable effort to identify specialty specific factors that may prevent the progress of women already in the specialty,[50] this research needs to be taken further to determine the factors that lead to male and female resident disillusionment and medical students' avoidance of the specialty. Finally, we have suggested that the assessment of site specific discordance between intended curricula and the actual messages conveyed to students, residents and junior faculty is also important, therefore the development of reliable, valid and feasible tools for this assessment is required. These tools could be incorporated into the accreditation process to facilitate change; however this would ideally be combined with the establishment of an experienced resource network to assist sites in defining effective solutions to rectify identified issues.

There is no question that a comprehensive redesign of the whole learning environment will be considerably more challenging than redesigning the formal curriculum alone,[23] but our failure to do so would be neglecting our patients and students. In moving towards the goal of a truly concordant curriculum, it will be important to ensure this is more than a one-time change. To be successful, we will have to design a mechanism to facilitate continual evaluation not only of the formal curriculum, but also of the informal and hidden curricula to ensure that together they transmit a strong message continuing to meet the changing needs of society. In the meantime, we would encourage each individual front line surgical educator to consider and reflect on the significant contribution they are making to the hidden curriculum on a day to day basis.

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