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Challenges of Teaching Surgery: Ethical Framework

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Abstract. Surgeons, trainees, and patients may be uncomfortable with the secrecy that surrounds the process of teaching and learning surgical procedures. Well structured training programs use a system of graded responsibility, supervision, and evaluation to ensure skill development and patient safety. Patient outcomes are generally excellent in training institutions. Disclosure of the role of trainees and their contribution to care enhances trust.

You can't learn to play the piano by attending concerts.
—Francis D. Moore

"Doctor, are you going to do my surgery yourself?" Surgeons face this question regularly from frightened patients searching for reassurance that they will not become a "teaching case" for a trainee. Even when the question is not asked, surgeons silently live with the issue as they struggle with their moral responsibilities to give the best care to each patient and their duty to train future generations of surgeons as they themselves were trained. Atul Gawande [1] eloquently described the trainee's experience with the ever-present, unspoken moral burden of practicing on people. Responses to the patient's query often attempt to veil the truth: "The team will be doing your surgery" or "It takes more than two hands." Rarely does one say, "I will be assisting while the junior resident does his first appendectomy".

Yet our trainees must perform surgery to become surgeons. This age-old tradition has somehow escaped the lay patient's general knowledge except perhaps for the occasional media exposé or the inquisitive patient who recognizes the meaning of the signs posted in the hallways of academic health science centers describing the participation of trainees in their care. There is an unrealistic fear among surgeons that should "the secret" get out patients would go elsewhere for care or lose trust in the system.

Surgeons are faced with multiple responsibilities in a teaching hospital. A system of graded responsibility and supervised training ensures optimal patient care, fulfilling the surgeon's obligations to individuals, the medical profession, and society. Patients entrust their bodies to surgeons because they consider them trustworthy. Trust is fundamental in human relationships. Yet to entrust is to become vulnerable and dependent on the good will and motivation of those we trust [2]. We posit that it is this entrustment that should fundamentally shape our thinking about surgical training programs.

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Challenges

Role of Trainees

The invasive and potentially life-threatening nature of surgical therapy requires an extraordinary degree of trust and entrustment from the patient. When entrusting their lives (or their vision, limbs, organs, or appearance) to surgeons, patients may be unaware that they are also entrusting themselves to the training program, a fundamental contextual feature of the institution in which they may be receiving their care. In a study conducted at The Hospital for Sick Children, Department of Ophthalmology outpatient clinics, parents had virtually no understanding of the roles of medical students, residents, and fellows (Levin, unpublished). Yet most accepted trainee involvement provided supervision was in place and the parent was informed. King et al. [3] studied alert elderly patients and found that 29% did not know what a medical student was, and 59% did not know that they were the subjects of teaching. Once told, 97% had no objection to being interviewed by students, 87% had no objection to being examined by students, and 85% expressed a desire to help student doctors learn by allowing their involvement. However, a resident performing a surgical procedure is different from students taking histories or performing physical examinations in several important ways: The surgical trainee undertakes more risk but at a higher level of proficiency, training, and maturity. The patient may also perceive this difference. In another study, Lawton et al. [4] studied covert trainee-performed, nonconsensual pelvic examinations on women who were under general anesthesia. They found that all of the patients favored specific consent for such activities. Some suggested that to do otherwise would leave them feeling "physically assaulted" should they discover that it had occurred. With appropriate disclosure, however, the refusal rates were only approximately 5%. More research is required to clarify and understand the perspectives of well informed patients on their participation in surgical education.

Respect for autonomy and the expectations of fiduciary responsibility require disclosure of the role of trainees in patient care. The only exception to this principle would be "therapeutic privilege": the situation in which the physician believes full disclosure would be harmful to the patient. In at least one decision by the Supreme Court of Canada [5], therapeutic privilege was rejected as a defense. The Supreme Court has allowed for specific exceptions to full disclosure in narrow and exceptional circumstances where the patient's emotional state places them at significant risk for adverse consequences from the receipt of bad news [6]. There may also be cultural variation in the acceptance or rejection of the concept of therapeutic privilege. It appears prudent for physicians to avoid the use of therapeutic privilege as a justification for nondisclosure and at least offer the patient the option of accepting or rejecting an offer of full disclosure, although full disclosure should be the goal whenever possible. Patients have a right to important information from their physician about their care, and physicians should proceed cautiously when following a patient's requested "waiver" of full disclosure [7].

The complete, unavoidable, albeit temporary, transfer of autonomy to the physician inherent in surgical therapy makes it imperative that surgeons fully appreciate the moral obligations implicit in the surgeon/resident/patient relationship. Patients do not have a moral obligation to participate in the training of future surgeons [8]. The resident's role in surgery and the supervisory role of the staff surgeon should be explained. There is evidence to suggest that given the opportunity to consent to trainee involvement patients have a positive response, as it gives them a sense of contributing to medical advancement, being on the "cutting edge," and receiving special attention [3, 9–11]. In this context, it seems that disclosure succeeds not only in enhancing the partnership between surgeon and patient but also in providing an overall increase in patient trust in the health care system.

Fairness

Is it "fair" to patients to "use" them to train novices? The principle of justice in medicine is intimately connected with what one deserves and can fairly expect to receive as a participant in the health care system. The fiduciary responsibility of the physician is already challenged because of the many divided loyalties. Because of natural limits, surgeons ration resources such as their time and access to the operation room. They divide and prioritize their time between multiple commitments to this system. It may be unfair for patients to expect undivided attention and resources from the staff physician, but it is perfectly fair for them to expect a reliable and trustworthy system of care with good outcomes.

Is trainee surgery in violation of the principle of nonmaleficence: *Primum non nocere* (first do no harm)? Surgeon educators sometimes believe that they could do a better job but honor their obligation to teach by allowing residents to perform surgery. Residents may live with feelings of guilt that they are polishing their skills on patients. These emotions are difficult and disturbing. Residency programs have an ethical obligation to develop mechanisms and systems ensuring that training of residents does not risk, harm, or have any detrimental effect on patient outcomes.

In most reported studies, outcomes in teaching hospitals with a residency program are equal to or better than those in nonteaching hospitals even after correcting for the increased intensity of patients in academic health science centers [12–17]. Several reasons have been cited for this. The academic structure of residency programs, resident involvement in the general care of patients, their sense of ownership, and the pressures on residents to perform well and keep abreast of current advances may all play a role. Supervision of trainees may actually increase the acuity of the staff surgeon's attention. However, Goodwin et al. [12] cautioned against extrapolating the salutary effect of pressure in the "see one, do one, teach one" approach to surgical education to all residents and programs.

Studies of resident surgery outcomes may suffer from bias in regard to the selection of patients [12–16]. Similar operations performed by residents and staff surgeons have similar outcomes, but staff surgeons operate on complicated, high risk patients. Yet Baskett et al. [13] found no difference in outcomes even with high risk cardiac surgical patients. Training in the institutions that have reported outcome data was closely supervised. Trainee surgery can prolong the operating time [14], and not all of the empiric data are favorable. An orthopedic study reported worse long-term outcomes in patients undergoing hip replacement surgery performed by trainees compared to staff surgeons [17].

Ethical Educational Framework

Training

Graded responsibility and continuous evaluation are the foundation for surgical teaching. After a resident can demonstrate an understanding of the surgical problem and its treatment, the next level of training should be, whenever possible, skill acquisition in a simulated situation or in an animal laboratory. Many surgical training programs have developed exquisite models for developing and testing surgical skills. In ophthalmology, for instance, donor eyes that are not satisfactory for corneal transplant are used for surgical training. Some programs use animal models for a wide variety of surgical experiences, sometimes coordinating trainees from different services to do their procedures on the same subject to avoid unnecessary sacrifice of animal life. Although surgical laboratory training still requires staff mentorship and skill evaluation, it helps alleviate the problem of surgeon educators' fatigue and impatience associated with training residents. After years of teaching, the gap between the surgeons' own skills and those of their trainees may appear to be increasing. Supervision of surgical training is time-consuming and requires patience. Basic skill development in a laboratory environment may make it easier for the staff to teach young surgeons year after year. Such basic training experiences also serve to develop the confidence of residents.

A gradual transfer of skills in patient care should be established in a supervised environment. Thompson et al. [18] found that the decision of surgeons to assign responsibility to a resident is based primarily on the resident's year of training because of the inherent difficulty of assessing residents' ability. These data reflect the surgeons' assumption and trust that the residency year correlates with skill level. Because there are indeed individual variations, a system of evaluation should be in place ensuring that residents achieve competence commensurate with their chronologic level in the training program. A well developed curriculum should include expected levels of knowledge and skills at each level of training.

Independent operating is the climax of a training program. It can only be accepted by patients and staff if certain requirements are met. The attending surgeon should know the resident's skills and

experience. The case should be discussed in detail by the staff and trainee to plan the procedure. Clear definitions regarding thresholds for when the staff surgeon will take over can be defined in advance. At all but the most senior levels of training the surgeon should be present in the operating room scrubbed for the procedure. Only after direct observation sufficiently ensures that a trainee has the requisite skill and judgment should the surgeon consider observing the trainee unscrubbed. Giving residents this independence late in their training facilitates their transition to a staff role as independent specialists upon graduation, but this level of independence is neither a requirement nor appropriate for some trainees, procedures, or training programs. The surgeon must be immediately available for help if needed during the operation. Trainees should not be used as a way for staff surgeons to free up their own time to be elsewhere. The staff surgeon is still responsible for the procedure even if not scrubbed and therefore must ensure that patients receive surgical care equal to the care they would receive if the staff surgeon were scrubbed. Patients who endorse trainee involvement do so with the understanding that their attending surgeon is in charge and providing appropriate supervision to ensure the level of care they expect.

Patients

Respect for autonomy and respect for persons imply that patients have the right to choose their surgeon, and the surgeon has a fiduciary responsibility to disclose the role of trainees [6, 7, 19, 20]. Only rarely does the latter conflict with the interests and wishes of the patient. A patient's refusal of trainee involvement should be accepted graciously and should not affect patient care in any way. In such instances the staff surgeon should perform the operation. The surgeon should never violate that trust by assuming that the patient "will never find out" that a trainee did the surgery. The literature and experience tell us that the patients infrequently reject trainee involvement. Not only is the surgical volume maintained at sufficient levels for training but also the training is enhanced by the role modeling of the doctor-patient relationship.

Huijer [21] stated that drug use, race, lower social status, older age, and unconsciousness of the patient appear to be factors that make it easier for supervisors to shift the responsibility for procedures to the intern or resident. These factors also make juniors more inclined to assume that responsibility. It is easier to cover up instructions and adverse consequences in such situations. However, no life should be valued less than another, and vulnerability should not be exploited for teaching purposes. The culture of treating all patients equally should be inculcated into trainees early; otherwise a culture of exploitation of the vulnerable may creep into training programs.

Should residents be allowed to operate on a colleague's mother, for example? Selection of patients for trainee involvement must take many factors into consideration: technical difficulty, risk, applicability to the trainee's future career, appropriateness for the trainee's skill level, and ideally patient comfort level and consent. Family, friends, and colleagues may also have expectations that come with respect, collegiality, courtesy, and camaraderie. In every profession we offer certain privileges to our friends: a bargain price, an extra ticket, free service. There is no reason why medicine need be different provided a "second tier" of health care is not created based on social, socioeconomic, or cultural factors. Whether it is providing a medical service after hours when not on call, making extra phone calls to comfort a patient, or personally choosing not to allow the resident to perform the operation, we are simply exhibiting a special feeling for that particular patient. There may also be a personal need for surgeons to take on special responsibilities: to believe they have "gone the extra distance" for their friend or colleague and assumed the responsibility they would not wish to relinquish for this special patient. It also acknowledges a need to protect the resident from the pressures of responsibility for potential complications or mortality in an emotionally charged situation.

Consent

It is unfair to presume that every patient in a teaching hospital implicitly or explicitly consents to treatment by trainees. Signs announcing the presence of trainees are not a substitute for a discussion of this issue between staff surgeon and patient. The residents should familiarize themselves with their patients' understanding of the situation and clarify their own place in the hierarchy of the team. This practice establishes confidence in the patients and enhances their trust in the whole team.

Ideally, the trainee is introduced to the patient and participates actively in the patient's care prior to surgery. We have found that patients are reassured when they learn, in the example of pediatric eye surgery, that the fellow is a licensed physician, a licensed ophthalmologist who has years of clinical experience, has performed many hundreds of surgical procedures, and is now learning skills specific to pediatric ophthalmology. When the structure of a program does not make it possible for trainees to meet and examine patients in the clinic on whom they will subsequently be operating, the resident must be expected to review the charts in advance and, at the very least, be introduced to the patient in the preoperative waiting room.

A consent form signed by the patient indicating that the procedure is to be done by the surgeon "or his/her designate" is not sufficient, as patients may not take the time or be given the time to read these forms. The language may be beyond the patient's level of understanding. Consent forms in many teaching hospitals are ambiguous on the issue. The consent form often reads: "Dr. . . . . and/or members who form part of his/her team to perform upon me/my patient the following operation/procedure" or "Dr . . . . . or whom s/he designates to perform all or part of the treatment or operative procedure." Patients may not truly understand that this means a trainee could be doing their surgery. Bottrell et al. [22] reviewed 540 informed consent forms from 157 American hospitals and found that the content of these forms did not meet the accepted standards of informed consent for patient-physician interaction. Consent forms should explicitly state the trainee's potential role. Some hospitals have moved to have the trainee's name listed on the consent form. Even if the forms are revised, the issue should be discussed by surgeon and patient. This discussion should occur well in advance of surgery if possible, not in the preoperative waiting room on the day of surgery when patients are most vulnerable.

International Perspective

Developing countries with limited human and financial resources and high patient volumes require trainees to assume increased responsibility. The difference in quality and availability of health care varies; rural and inner city clinics and hospitals are often understaffed. Combinations of illiteracy, ignorance, and poverty leave

people with no choice except to entrust their lives to the hands of their presumably benevolent physicians, regardless of whether they are fully trained. The question is not "Who will operate on me?" but "When will someone—anyone—operate on me?"

In Third World countries most people access public sector hospitals if they are available. Governments in these countries spend less then 5% of their limited gross national product on health, and the conditions in such facilities are often suboptimal. With a high burden of patients, many of whom are first seen with advanced disease, surgeons are overwhelmed with work. (Paradoxically, large patient populations are also seen in such countries as Canada or by the choice of some physicians in the United States.) Patients attending these high volume centers may feel powerless and voiceless. Lack of adequate supervision is a norm in such training programs. It is surprising how readily trainees accept these conditions as normal and do not find them disconcerting. There are no empiric data on outcomes, but the personal anecdotal experience of one of us (A.J.R.) has sometimes been alarming.

The issues are complex and are a reflection of global inequities in health care. Beyond the realms of autonomy and beneficence that dominate discourse in Western medical ethics, there are issues of justice and human rights. This does not preclude surgeons from doing whatever is possible in these resource-poor and disease-riddled populations. Inadequate supervision can lead to poor outcomes, resulting in increased morbidity and an extra burden on meager and strained health care resources. Once complications set in, the tertiary care needed is either inaccessible or extremely expensive, reinforcing the need to "get things right the first time." Despite the difficulties in poor countries today, we must strive to develop structured training programs, with an acceptable level of supervision and evaluation of trainees a must. Alternatively, when possible, training can take place in developed countries. Partnerships between developed and underdeveloped nations may offer some relief. This would uphold the dignity and sanctity of human life and respect the rights of all involved.

Conclusions

Surgical skills have been learned and practiced on patients for centuries, yet the status of the role of trainees is usually undisclosed. Skill development requires practice in a real environment. Dealing with human lives demands that this process be structured and safe with well defined boundaries and limitations. In an essay titled The Ethics of Learning from Patients, Schooner [23] reminded us that, "When we avoid disclosing the relevant truth to a concerned patient, we enter a vicious circle that reinforces our prejudices and makes us underestimate people's incredible willingness to contribute."

The responsibility that comes with the trust our patients place in us does not obligate us to deny our trainees the opportunity to learn how to perform surgery. Evaluation and supervision of our trainees along with disclosure of their role to the patient offers surgeons an opportunity to fulfill their societal obligation to train the next generation of surgeons while respecting the rights and best interests of their current patients.

Résumé. Personne, ni les chirurgiens, ni les résidents en formation ni encore les patients n'est confortable en ce qui concerne le «secret» qui entoure l'enseignement ou l'apprentissage des interventions chirurgicales. Les programmes d'apprentissage font appel à des systèmes de responsabilité hiérarchisée, la supervision et l'évaluation afin d'assurer le développement de la dextérité et la sécurité des patients. Le niveau de résultats est généralement excellent dans les institutions d'apprentissage. Une information aux patients quant au rôle des apprentis et leur contribution aux soins améliore la confiance.

Resumen. Los cirujanos, los aprendices de cirujano y los pacientes desconfían del secretismo que envuelve a todo el proceso de enseñanza de las técnicas quirúrgicas. Los programas de aprendizaje bien diseñados, conllevan un sistema de responsabilidad gradual bajo supervisión y evaluación continuada para asegurar que las destrezas que se aprendan salvaguarden la seguridad del paciente. En hospitales universitarios las respuestas de los pacientes suelen ser excelentes. Revelar el papel que desempeñan los aprendices, así como su contribución a la asistencia y cuidado de los pacientes, aumenta la mutua confianza.

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