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Medical Ethics

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Quote to note

"Ethics is in origin the art of recommending to others the sacrifices required for cooperation with oneself."

—Bertrand Russell

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Umbilical cord blood banking

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There are three major types of umbilical cord blood banks: (1) public banks that accept donations from families and the units are stored for public use, similar to a blood bank; (2) directed donor banks that accept units from healthy babies and store the cord blood for family members with a disease treatable by stem cell transplantation, such as sickle cell anemia; and (3) private banks that accept cord blood units from healthy babies for a storage fee in anticipation that they might one day be used by that family. Worldwide, there are approximately 250,000 cord blood units stored for public use and 800,000 units stored for private use.

Umbilical Cord Blood Transplantation

Cord blood is an alternative stem cell source for patients with leukemia, lymphoma and genetic disorders who have diseases that can be cured with a stem cell transplant, but who do not have a matched donor. Cord blood is rich in hematopoietic stem cells, the building blocks of blood cells, which allow the bone marrow to be rescued successfully from the toxic effects of high-dose chemotherapy. Only about 30% of patients will have a fully matched donor in their family. Of the remaining 70%, approximately half will find a fully matched unrelated volunteer donor in the National Marrow Donor Program or other international registries and be able to proceed to transplant. It is more difficult for African-Americans and other minorities to find unrelated donors. Because the immune system of the cord blood cells is more naïve than adult bone marrow, the risk of graft versus host disease, a serious immune complication of transplant, is less than with a standard bone marrow or peripheral blood stem cell transplant.

The first cord blood transplants were performed in children with leukemia with excellent results.[1] Umbilical cord blood transplantation has also been used successfully to treat children with nonmalignant diseases, such as sickle cell anemia, thalassemia and metabolic disorders.[2]

Cord blood transplantation in adults was initially hampered by the low-cell dose and high rates of infection.[3] Two advances have improved these results. First, the use of double cord blood transplants has increased the cell dose administered to patients, allowing blood counts to return more rapidly.[4] Second, non-myeloablative or reduced intensity transplants utilize chemotherapy drugs that are better tolerated and safer, particularly for older patients.[5] These changes have improved survival to 40–60% for adult patients with high-risk leukemia.

Family Member Banking

Cord blood transplantation from a related family member is an effective therapy for patients with hematologic malignancies and hemoglobinopathies, such as sickle cell anemia and thalassemia. The Children's Hospital Oakland Sibling Donor Cord Blood Program is a nationally funded program for storing family member cord blood

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***Cord blood**—continued from page 1*

for those who have clear indications for transplant, and has more than 3,000 cord blood units in inventory.[6]

Cord Blood for Personal Use

Private cord blood banks charge a fee to collect and store cord blood. Interest in private banking has developed due to (1) parental interest in "biologic insurance" in case a child develops a disease that in the future can be treated with an autologous (own) cord blood transplant; and (2) aggressive marketing by the private cord blood banks. The economics of cord blood banking favor private banks, as a private bank receives immediate income at cord blood collection and an annual storage fee. A public bank only recovers costs (charged to the recipient's insurance company) when a cord blood unit is shipped for transplant.

The private storage of cord blood units for future cord blood transplantation raises several concerns.

The probability of clinical need. It is challenging to estimate the likelihood of the use of an autologous cord blood unit collected at birth from a healthy baby, and the future uses of cord blood. There are a few case reports of personally stored cord blood units collected at birth and used successfully for autologous transplantation in later life. Conditions treated include neuroblastoma, aplastic anemia and acute leukemia[7,8] The American Society of Blood and Marrow Transplantation (ASBMT) estimates the chance of lifetime use of a stored autologous cord blood unit as between 1:2500 to 1:200,000.[9]

Undetected disease. Diseased cells that may lead to leukemia or cancer in later life may be present at birth in the baby's cord blood unit, but may be undetectable.[10]

Quality of stored cord blood units. The standards for public cord blood banks are stricter than private banks in terms of maternal eligibility and nucleated cell count requirements.

Opinion of medical community. The ASBMT, the American Academy of Pediatrics and the American College of Obstetrics and Gynecology (ACOG) have suggested that parents donate their children's cord blood to public banks and to store for their family only if there is a first-degree relative (sibling, parent or child) with a disease that is known to be treatable with a cord blood transplant. All three organizations discourage parents from purchasing "biologic insurance" for the unlikely possibility that their child will need a cord blood transplant.[9,11] In Europe, cord blood banking for private use is illegal in France and Italy, but permitted in Spain.

Conclusions

Expectant parents today have several options for their baby's cord blood unit: discarding the unit; donating the cord blood to a public bank for general use; or purchasing personal storage for their own family's use. From a medical standpoint, the likelihood of a personally stored cord blood unit being used is extremely low, and I do not recommend personal storage. There may be a community benefit from donating the cord blood to a public bank. However, analogous to organ or blood donation, the donation must be voluntary and not mandated.

In opposition to the French and Italian positions, I believe that the personal autonomy of the family should be maintained and the option of private cord blood banking not be outlawed. Patients are often allowed to make choices that are not aligned with the medical community, such as cigarette smoking or excessive alcohol use. However, the medical community does have an obligation to inform parents of the low likelihood of the "biologic insurance" ever being needed.

Finally, most cord blood units are discarded and this valuable stem cell product is wasted. This may be due to the limited availability of public cord blood banking, given the extensive financial and regulatory resources needed to maintain a cord blood bank. In some cases, family preferences and religious/cultural beliefs may prevail. I believe that families should have the option of discarding the cord blood unit, and that discarded cord blood units cannot be taken for public use. While I recommend public storage of cord blood where available, the autonomy of the donor is paramount. □

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Ask the ethicist:

Should this 31-year-old woman with mental retardation be sterilized?

Question: *A physician wants to facilitate a bilateral tubal ligation (BTL) for his primary patient, a 31-year-old woman with mild mental retardation who lives in a coed school. Her seizures were difficult to control, and have responded to an anticonvulsant medication that can cause birth defects. Her neurologist thinks that anticonvulsant levels might fluctuate during pregnancy and increase her risk of recurrent seizures. The woman's mother doubts she could raise a child. The mother does not know whether her daughter is sexually active, but wants her to be able to have an intimate relationship. The mother prefers that her daughter undergo BTL rather than use birth control because she wants a method that is 100% effective. The patient does not have a legal guardian and her mother wants to avoid any legal proceedings. Her mother claims her daughter has the capacity to make an informed decision. How would you advise the physician to proceed?*

Response: BTL may be a more extreme treatment than appropriate for a mildly retarded 31-year-old woman with unknown reproductive wishes. However, the incidence of stillbirth, microcephaly, mental retardation and seizure disorders is increased two- to fourfold in children born to epileptic mothers,[1] and although some anticonvulsants carry significant fetal health risks,[2] neither laparoscopic surgery for BTL nor long-term exposure to contraceptives are risk-free, so the issue is complex.

I would seek a richer biographical understanding of this patient by interviewing her, her mother, physician and school director. I would need to understand how this decision will likely fit into and possibly affect the patient's future medical decisions. A BTL decision can best be made once we understand how well the values and priorities that have guided and shaped the patient's life have served her. Knowing how to advise the physician requires seeking answers to the following three sets of questions.

Medical care context: How well does the patient manage her personal self-care now, including menses and anticonvulsant medication? Are any other medical conditions or factors relevant in this decision?

Does the patient's medication pose fetal risks at conception or only after prolonged exposure? If it poses immediate risk and the patient is sexually active there already exists potential for fetal harm, and a BTL decision is pressing. If the risk accrues only over time, then changing anticonvulsant medications may be delayed until a pregnancy occurs, if ever.

BTL provides contraceptive certainty and permanence, but one hesitates in the ethical shadows of the mass sterilizations of the eugenics movement. A coordinated conversation among the school director, physician and consulting neurologist about the patient's ability to make this medical decision, and her ability to raise a child safely and responsibly as a single or coparent, may be helpful if the physician is willing to pursue it.

Social context: The mother's views conflict in that she both worries about her daughter's abilities to care for a child and insists that her daughter can make a rational and appropriate choice about this medical decision. Many persons with cognitive and/or motor skill limitations become successful parents, but might those combined limitations overwhelm this woman's abilities to provide proper care? Who is best informed to make this assessment and what supportive resources are available to the daughter if BTL is refused?

Despite the mother's hesitations, this is an appropriate precipitating event for considering limited medical guardianship. It would be inappropriate simply to grant her mother's request without knowing the patient's opinion and the context of her capacity to make important choices. Absent an objective clinical assessment of the patient's cognitive abilities, the legal and ethical validity of her consent or refusal to BTL is unknown. If she refuses the surgery, her mother must decide what she wants more—her daughter to have control of her medical decisions, or the BTL decision to go the way the mother requests.

As an ethicist I would counsel that if the patient refused the surgery, proceeding with a BTL would require a petition for guardianship appointment and a court order for the procedure, but neither outcome could be assured a priori. Moreover, BTL is not the only relevant medical question to consider. Mentally retarded adults experience high rates of affective disorders, depression, bipolar disorders and mental illness as they age,[3] so prudently anticipating the daughter's future medical needs and seeking a court's determination re: limited guardianship is timely, even if also time-consuming, expensive and cumbersome. A social work consult may be helpful here.

Patient context: What does the patient understand and want concerning this procedure and its consequences? How well have her other medical decisions been managed according to her and her care providers? What precedent might this decision set for making future medical care decisions, especially as she ages and requires more extensive care choices, and her mother is no longer available to assist?

Legally and ethically valid consent is a key feature if the patient is decisionally capable to provide it. If not, then assent from the patient and protective permission from an appropriately empowered guardian will be needed. State law may also require formal review by a probate court, and even discussing this matter may encounter HIPAA (Health Insurance Portability and Accountability Act) and other privacy protections for personal health information, including the Americans with Disabilities Act (1990), Rehabilitation Act (1973) and state law.[4]

Answers to these questions will situate the ethical issues in a particular and personal context, and knowledge of the patient's success managing prior problems will inform our estimates of her likely future success. That information combined with the patient's personal preferences, priorities and goals will help resolve uncertainty and permit formulation of personally and socially responsible counsel.

Ask the ethicist—*continued on page 8*

The legal column:

The refusal of mandatory immunizations

By Rick Hogan, JD, MPH
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Powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States."[1] This is how our Constitution defines the inherent authority of state governments to regulate private interests for the public good. From this expression courts have resolved that states, through their *police powers*, may require mandatory immunizations to protect the public. Therefore, a state by legislative enactment may define the pool of persons susceptible to disease and also define those who may be exempted from immunization.

Generally, there are three types of exemptions to childhood vaccinations: medical, religious and philosophical.[2] State regulation must be in conformance with four criteria: public health necessity, reasonable means, proportionality and harm avoidance.[3] To justify the use of compulsion, the state must act only in the face of a demonstrable health threat.[4] The methods adopted must have a "real or substantial relation" to protection of the public health, and cannot be "a plain, palpable invasion of rights."[5] Regulation must not impose a burden disproportionate to the expected benefit.[6]

All states have laws that permit medical exemptions when the patient is likely to be harmed by the vaccine. All states, except Mississippi and West Virginia, permit parental exemptions for children based on religious beliefs; 19 states allow parents to object to mandatory childhood vaccinations based on secular philosophical concerns.[7]

Approximately 1% to 3% of U.S. children are excused from vaccine requirements, though the rate varies from state to state: Schools in a few communities have exemption rates as high as 15% to 20%.[8] Typically, state Departments of Education adopt companion regulations that prohibit the admission to school or day care of any child without proof of age-appropriate immunizations or proof of an exemption granted by the Department of Health. To qualify for an exemption, state health departments require religious and philosophical objectors to complete an annual application, sign a notarized statement claiming conflict with religious or philosophical beliefs, complete an educational component regarding the risks and benefits of vaccination, and sign a statement of informed consent for the exclusion of a non-immunized child from school in the event of an outbreak.

Arkansas came to its philosophical exemption after its religious exemption was declared unconstitutional.[9] In *Boone v. Boozman*, Cynthia Boone objected to her daughter's suspension from school for not receiving hepatitis B vaccination. Cynthia Boone believed that vaccinations are "part of the devil's plan," and that vaccinating her daughter against hepatitis B, "supports the devil" in his effort to encourage her daughter to engage in unprotected sex and intravenous drug use.

The Arkansas law in question provided that no infant or child shall be admitted to a public or private school or child care facility who has not been age-appropriately immunized unless the parents or legal guardian of that child object thereto on the grounds that immunization conflicts with the *religious tenets and practices of a "recognized" religion* of which the parent or guardian is an adherent or member.

The courts held that the statute's religious beliefs exemption violated the Establishment Clause of the First Amendment, which "prevents a State from enacting laws that have the 'purpose' or 'effect' of advancing or inhibiting religion." If a statute discriminates among religious sects, the court applies strict scrutiny review. If the statute does not discriminate among religious sects, the court applies a less-stringent, three-pronged test called the Lemon test. To survive an Establishment Clause challenge under the Lemon test, a statute must: (1) have a secular legislative purpose; (2) have a primary effect that neither advances nor inhibits religion; and (3) avoid excessive government entanglement with religion.

The Arkansas Department of Health's Religious Exemption Application addressed the "Definition of a 'Recognized' Church" as follows. Parents or guardians, to claim a religious exemption, must demonstrate that the "religious tenets and practices" are those of a "recognized" religion. The department will consider such evidence as a permanent address, number of members, times and places of regular meetings, existence of a written constitution or plan of organization, a written theology or statement of beliefs, and copies of legal documents filed with any governmental agency. The application also asked numerous, detailed questions about the "recognized" religion. The court noted that Arkansas is not simply charged with determining what constitutes a church; rather, it is required to determine what constitutes a "recognized" church. The court interpreted this as possibly inviting excessive government entanglement with religion. The court left the law mandating immunizations intact but excised the "recognized" religious exemption.

Subsequently, the Arkansas legislature amended the law to permit medical, religious (omitting the need for a *recognized* religion) and philosophical exemptions from vaccination. The revised law requires a notarized exemption request from parents or legal guardians and includes an educational component that provides information on the risks and benefits of vaccination. Parents and legal guardians must sign a statement of understanding that the unimmunized child or individual may be removed from day care or school during an outbreak if the child is not fully vaccinated.

Some of the reasons frequently given for a philosophical exemption from compulsory vaccination include inconsistency with federal constitutional principles of individual liberty, an infringement of personal religious beliefs, and fear of autism. Philosophical exemptions now exceed the combined medical and religious exemptions in Arkansas. Total vaccination exemptions in Arkansas have more than doubled statewide since the 2003–2004 school year, to nearly 2,000 children. States that offered only religious exemptions have not experienced an increase in exemption rates.[10] These are consistent with national data indicating that increasing exemption rates have been associated with philosophical exemptions. The new law in Arkansas has contributed to concentrated pockets of

***Legal**—continued on page 7*

Ethics and the humanities:

One hundred days: my unexpected journey from doctor to patient

By David Biro
New York: Pantheon Books, 2000, 289 pages

Review by Rhonda L. Soricelli, MD
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Armed with an MD from Columbia, a PhD in English Literature from Oxford, happily married and recently ensconced in his father's dermatology practice, 31-year-old David Biro is about to sit for the Dermatology Boards when he suffers a central retinal vein thrombosis of his right eye. With the help of his father, colleagues and friends, David is on the fast track to diagnosis. The verdict: paroxysmal nocturnal hemoglobinuria (PNH), a rare blood disorder affecting about one in a million people.

In this candid autobiography, Biro takes us on his "odyssey into the labyrinths of patienthood." As a "zebra" in medicine, a rare but highly instructive case for the medical team, he faces unsettling conflicts as he switches roles from physician to patient and back again. On the one hand, he knows that "medicine has always been a spectacle at the expense of sick people." On the other, he can't help but be excited by his next "impressive case," acknowledging "I am torn by conflicting feelings. By sympathy and fascination." Uncertainty begins to color every day. There is ambiguity in his diagnosis and the best course of action is unclear. "One doctor believes this, the other that, and I am left to ponder the universe from my tiny, insecure and woefully unintelligible vantage point." It is this intolerable uncertainty that pushes David to opt for a curative allogeneic bone marrow transplant, despite its risks, rather than taking the more conservative approach—treating his disease with immunosuppressive agents.

This is no sentimental memoir. Biro shares with us each painful step along the way, from pre-transplant marrow ablation to post-transplant marrow reconstitution, describing in graphic detail outcomes such as alopecia, severe ulceration of his mouth and gut, total sloughing of his scrotal skin, rigors, delirium, pain, extreme weight loss, and the intolerable claustrophobia that bears in on him as his fevers abate and blood cell counts rise. As he confronts each new medical issue, obstacle or decision, he explains in terms that everyone can understand the pathophysiology at hand and the reasoning behind his choices.

Throughout, Biro writes with unflinching honesty and, at times, great wit about his phobias, fears, hopes and dreams. His trips to the sperm bank and three-day collections of urine, for example, are splashes of humor that lighten a grim situation. Each character in his personal drama is drawn with the hand of an artist, from family members and friends to all on the health care team who labor on his behalf. He enters into the growing tensions between his close-knit Jewish family (who essentially take over) and Daniella, his reserved, independent, but very private wife. His parents' love and sources of guilt are revealed through the poignant journal entries they scribe on David's behalf when he is too ill to write. The relationship he shares with his sisters is clarified when, worrying that he has not thanked Michelle, his sibling donor, enough, David writes: "[t]he gift of marrow came from them as a unit, an indivisible group. I see, I speak, I move with the blood cells of my sisters." The constancy and strength of Daniella are palpable as she accompanies David through each long night, gowned, masked and gloved, "my faithful vigil, huddled on the pullout chair." Without a shred of judgment, Biro teaches us so much—about family, love, and the different ways in which we cope.

For Biro, the return home is traumatic. "The first one hundred days constitute the critical period" and he has eight more weeks of relative isolation, potential complications and uncertainty to endure. Rejecting medical advice and the daily presence of his family as now infantilizing, he fractures his left foot in a bathtub fall while alone in his apartment. The trip back to the hospital, the ensuing leg cast and the return of his mother to her daily tending are devastating. Biro's description of these darkest of days is powerful and arresting. "Time filled with nothingness moves incredibly slowly. My inner world is as empty as the outer one. I am frozen in a kind of shock state—mouth open, pupils dilated, eyes fixed on something terrible before me, paralyzed by an unwillingness to either run or fight, waiting for a merciful annihilation."

Biro's honesty and integrity are revealed time and again. He freely acknowledges the privilege of his insider status. He is ashamed at his early avoidance of other patients, "not [out of] pity for them but fear for myself" and agonizes, "[w]hy am I always so competitive? Will I ever be as compassionate as…?" And yet it is the contact with other patients "sometimes inspiring, sometimes disheartening," that plays a key role in his turnaround. When asked if his experience has changed him, Biro does not wax eloquent about empathy, rather his response is more tempered: "I've become a more tolerant doctor, perhaps even more empathic…But then again, I've also become more intolerant.…less apt to coddle." Ultimately, Biro remarks on the irony of it all, beginning with his doctoral thesis on the rhetoric of pain: "It seemed I really knew my subject. *Really.*" Later he would know: "Irony is not just a trope we encounter in literature; it gallops through life, snickering."

Today, David Biro divides his time between writing and seeing patients. He and Daniella, a prominent fashion executive, are the proud parents of six-year-old twin boys. His latest book, tentatively titled *The Language of Pain*, has just been accepted for publication. However, he still lives with radiation-induced complications and daily uncertainty. Last year, he developed central retinal vein thrombosis of the other eye, forcing him to question if he had all the facts correct when he opted for the transplant in 1996. Would he do it all over again? Probably. □

Dialogue:

The ethical challenge posed by surgical innovation

Nature knows no order and every effort by man to put the natural occurrences of the world into a lockstep, predictable sequence of events has led to both frustration and discovery. Is it any wonder then that creativity—the soul stone of innovation— rests within the realm of chaos be it within the subjective or objective world? For the surgeon, this is ever true as he or she struggles to understand each surgical complication: why no operation works in 100% of patients, why despite experience of 1,000 cases it is the 1,001st case that goes awry. And from that disquieting experience, whether actual within the confines of the operating room or subjectively within the mind of the surgeon trying to re-create the circumstances that resulted in a problem, springs the creative energy to develop "a better way."

The challenge for the surgeon as a creative being is that unlike all other arts, the surgical medium is sensate. Every alteration in a tried-and-true technique exposes both the surgeon and patient to censure and unknown complication, respectively. Unlike the undrawn canvas or the drawn curtain, the surgeon's means of expression requires — morally demands—an overarching protective body or structure since any exercised ill-conceived concepts hurt the medium more than the messenger.

The question arises, at what point along the creative continuum does a minor variation on a theme become an innovation? When does the surgeon-scientist need to ask or request a panel of peers to review an idea or concept and judge it—seeking permission prior to performance? How well equipped is the average institutional review board (IRB) panel, all too often composed of a minority of surgeons, able to pass judgment? Where does reason meet ethics and to what extent? How does the good of the whole stack up against the good of the individual? Who is to judge and who is ultimately responsible?

In years past, as Dr. Agich notes ("The ethical challenge posed by surgical innovation," *Lahey Clinic Journal of Medical Ethics*, Spring 2008), there were no controls on surgical innovation outside of the realm of the surgeon's own ethical and moral compass. However, the examples Agich cites in which a "cowboy" mentality may have been perceived were all examples of "disease without hope"…these innovations (open heart surgery, coronary artery bypass surgery, organ transplantation) were being done as last-ditch efforts to save a dying patient. The only alternative to surgical innovation for these desperately ill patients was death.

In 2008, death is no longer the motivating or justifying factor for most surgical innovation. The surgeon today, through technology, seeks to accomplish a surgical cure while lessening surgical morbidity, hence the advent of minimally invasive surgery. However, as the incision wanes, the technology waxes and thus the surgeon must now enter a realm unfamiliar, that of the medical-industrial complex. While the surgeon is thinking less pain, quicker convalescence, better cosmesis, the industrial side of the partnership is evaluating potential profit/loss, marketability and expense of development. In this light, it is essential that the IRB stand between the innovator and the patient, just as the FDA now stands between industry and the patient.

The IRB has the ability to evaluate the scientific merit of a proposal as well as the safety of the proposed procedure. Before bringing a procedure to the IRB, the appropriate scientific studies should have occurred in the laboratory—therein the creativity borne of chaos can be objectively evaluated prior to proposing a movement from the bench to the bedside. In this regard the sage advice of Dr. Agich bears repeating: "We need a well-grounded set of criteria to differentiate at least three types of cases: routine or normal variation; innovation that is beyond routine, not formal research, yet requires review; and innovation that involves research and so requires formal IRB review."

However, as with most gradations, the extremes are obvious (one and three), it is the middle ground (two) that provides the greatest challenge and concern. Certainly those procedures that have been developed in the laboratory and then are coming to the bedside require IRB approval (three) and certainly the surgeon's decision to use a different type of suture or a smaller size suture that represents a deviation from normal routine does not merit the IRB's consideration (one). The problem arises with the second position: innovation that is beyond routine, not formal research, yet requires review. For example, if laparoscopic removal of a kidney, based on laboratory work, is approved, should laparoscopic cyst decortication, not coming out of the lab, require formal approval? The latter is less of a procedure than the removal of a kidney, but has not undergone any rigorous laboratory evaluation due to lack of a proper animal model and the overall simplicity of the procedure. Yet it does represent an "innovation that is beyond routine." Today, the safest course for a surgeon, to address the best interests of the surgeon and patient, is to seek that approval and "protection" from the IRB, onerous though this may seem.

The key operative here is the IRB and the lowering of the surgeon's threshold for seeking its approval. Surgical research has evolved rapidly over the past 20 years. The introduction of new technology has enabled the surgeon to enter realms hitherto inaccessible. In a brief span of time, we have seen major operations fall to less invasive technology in the form of laparoscopic and robotic surgery. "Taking it to the laboratory" provides the surgeon with the in vivo or cadaveric experience to discover and develop a procedure to the point of clinical practicality.

However, the system will never be perfect, for unlike in pharmacology, where the pill is a constant, in the operating room the surgeon remains an individual and collective variable. Each of us, within ourselves, improves with experience, and none of us is identical to any of us. Hence, what works in one person's hands on one day may not work on another day due to patient selection or variation in individual performance; similarly, no two surgeons have an identical skill set. To overcome this challenge, well-planned singular and multi-institutional studies are needed to test a new procedure's potential benefits and shortcomings. The IRB again comes into play to consider the surgeon's hypothesis and the proposed methodology for effectively testing it.

The third and final goal, after discovery and development, is to bring a new procedure to the point that it can be taught effectively, once its value has been proven. Anything less is of little value to society. To innovate is far easier than to disseminate, and the accolades/financial

gains afforded the innovator inevitably exceed those for the teacher. Yet it is in the dissemination—the teaching—that society truly benefits. If a technique cannot be taught, then after the passing of the innovator, it is as if it had never existed. Innovation for the sake of innovation does not move the society forward; innovation needs to be coupled to the dogged commitment of dissemination in order to "change the way things are done." Herein, the commitment of the surgeon-teacher to the society is at issue.

The four final concerns of Dr. Agich are valid, yet I have no bona fide means to address them. The comingling of ethics and science provides one of the greatest ongoing challenges to the surgeon. For the time being, one can only place faith for safe, ethical surgical progress in three sequential arenas:

a.) The testing of hypotheses and new technology under laboratory conditions in university or industry settings. The chaos of discovery and the order of development are free to reign under these conditions far removed from the clinical arena.

b.) The transfer and further development of these new procedures within the clinical realm. That needs to be accomplished under the watchful eye of a committed and diverse local regulatory body, which in today's hospitals/medical centers is the IRB. In this regard, attention must be directed to proper phase one, two and three studies of both a singular and multi-institutional nature. Procedures should be proven to be safe and of worth before moving to the next step, dissemination.

c.) Commitment of the innovators, to teach and share their expertise with their colleagues.

Courses, minifellowships, and the development of curriculum-based surgical simulators are essential to this final step. The last of these, simulation, has the potential truly to ensure that each surgeon performing a procedure for the "first" time in the operating room will be successful, having practiced and mastered it on a validated simulator outside the operating room.

Cowboys belong on the range; surgeon-scientists should populate our university operating rooms. To this end, society needs to support not only basic and clinical surgical research but also the need to disseminate those "procedural advances" through effective and measurable education.

Ralph V. Clayman, MD
Professor and Chair
Department of Urology
University of California Irvine

Response: The crux of Ralph Clayman's response to my article is found in his admission that "Today, the safest course for a surgeon, to address the best interests of the surgeon and patient, is to seek that approval and 'protection' from the IRB, onerous though this may seem."

My article was designed to question this response by arguing that innovation in surgery is a heterogeneous class of activities only some of which clearly fit the paradigm of research that proceeds from "bench to bedside." The dominance of this idealized progression reinforces Dr. Clayman's apparently reluctant concession that the surgeon should follow this course of action. My article was designed to question this assumption and to suggest that the development of innovation in surgery is far more complex than the bench-to-bedside paradigm supports, raising the deep question about how should we ethically conceptualize surgical innovation and, correlatively, how should we structure a process to assure that the patients—not the subjects—undergoing treatments utilizing innovative surgical elements are truly protected.

I proposed a distinction to cover cases ranging from routine or normal variation within surgical practice and technique; innovation in surgical technique or approach that is beyond routine, but not yet formal research that nonetheless needs ethical review; and, innovation that includes research and so requires formal IRB review. The problem is that the last category has tended to subsume the former.

Dr. Clayman and I agree that the middle category is the most troublesome, but, perhaps, disagree that conceding to the demand for IRB review and approval is appropriate. It may be prudent for surgeons to seek this institutional protection under current circumstances, but it is not ethically or conceptually well founded. Of course, stating that only opens the field for conversation about how best to ethically structure innovation in surgery to which Dr. Clayman's other comments, most notably about the obligation to transfer and further develop new procedures, deserve serious attention.

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unimmunized children, some who may be immune-compromised and subject to greater risk of morbidity and mortality from vaccine-preventable diseases.

It is a more difficult legal case to defend a vaccine that prevents cancer or chronic diseases. The intent of hepatitis B and human papilloma virus (HPV) vaccines, in addition to preventing acute infection, is to prevent the liver (hepatitis B) and cervical (HPV) cancers associated with these viruses. However, the immediate harm to society from a chronic disease may not be apparent. As a result, public health actions taken by governments may not appear to meet the legal burden of proof required for infectious diseases. Within the past few decades, because of attention granted by courts to protecting individual rights and due process, HPV mandates will soon be challenged, primarily with the underlying concern of the courts being, is there a public health necessity or urgency protected by requiring a child to be vaccinated against a disease not easily transmitted through the air.

One challenge will be to articulate the public health necessity to protect the public from chronic disease by vaccine. This burden will be met, in part, by establishing the overwhelming financial cost and burden on the health care system of unchecked chronic diseases. Vaccine paradigms must also include a model for protecting the public from the potential collapse of the public health care system from the added financial burden of chronic diseases. □

[1]U.S. Constitution 10th Amendment.

[2]Jacobson v. Mass, 197 U.S. 11, 11 (1905).

[3]Gostin L. *Public Health Law: Power, Duty, Restraint.* Berkeley: University of California Press; 2001, 66–69.

[4]Jacobson,197 U.S. at 35.

[5]Jacobson, 197 U.S. at 31.

[6]Gostin, 69.

[7]National Vaccine Information Center, http://www.909shot.com/Issues/state%20exemptions.htm. Accessed July 4, 2008.

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Ask the ethicist—continued from page 3

Outcome: A gynecologist agreed to perform the BTL; however, technical problems were encountered and the procedure could not be performed.

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[1]*Clinical Neurology*, 6th edition, Complications of Epilepsy and Anticonvulsant Therapy.

[2]Twenty-four percent of the children of mothers who took valproate (Depakote) during pregnancy showed an IQ in the mental retardation range. NIH-funded study presented by Meador, KJ, MD, FAAN at the American Academy of Neurology's 59th Annual Meeting, Boston, April 2007, and reported in the *Alliance for Human Research Protection* website, http://ahrp.blogspot.com/2007/05/24-of-children-of-mothers-prescribed.html, accessed July 25, 2008.

[3]Jenkins EL, Hildreth G. Elderly persons with mental retardation: an exceptional population with special needs. *Int J Aging Hum Dev* 1993;37(1):69–80.

[4]Committee on Bioethics. American Academy of Pediatrics. Sterilization of women who are mentally handicapped. *Pediatrics* 1990:85(5): 868–71.

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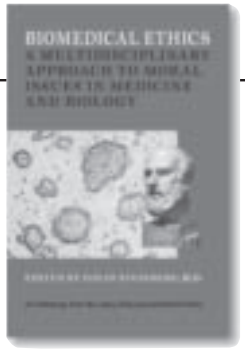
[8]Colgrove JK. *State of Immunity: The Politics of Vaccination in Twentieth-century America.* Berkeley: University of California Press; 2006.

[9]Boone v. Boozman, 217 F. Supp. 2d 938 (E.D. Ark. 2002), appeal dismissed as moot by Ozark Sch. Dist., 359 F. 3d 1029.

[10]Omer SB, Halsey NA, Moulton LH, et al. Non-medical exemptions to school immunization requirements: secular trends and association of state policies with pertussis incidence. *JAMA* 2006; 296: 1157-1763.



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