

## Switching swine for simulators: At what cost?

Consider the pig. In terms of respect, it is the Rodney Dangerfield of the animal kingdom — it gets none. Horses are admired for their well-defined musculature; pigs are famous for their immense bellies and fondness for mud.

When you imagine a lion, you think: proud, strong, majestic. When you imagine a pig, you think: bacon.

But some people hold the muck-loving hog in high esteem. You'll find them in the surgical departments of medical schools. Surgeons-in-training have long honed their skills on live pigs because of their anatomical affinity with humans. Some doctors who provide early care for accident victims practise surgical procedures on pigs, too, as part of a popular trauma course.

Other doctors, however, are refusing to participate in animal labs, even if it hurts their careers. They claim it's unnecessary to kill pigs to train doctors when an alternative exists. But others say the alternative — high-tech mannequin torsos called human patient simulators that have realistic skin and tissue — is a poor substitute for real flesh.

If the simulators are adequate, it all boils down to cost. But if they aren't, a thorny question arises: How much compromise to the quality of surgical training is a pig's life worth?

"I believe you have to consider the higher purpose for which you are taking the animal's life," says Kathrine Grant, manager of the trauma program at London Health Sciences Centre, a teaching hospital affiliated with the University of Western Ontario in London, Ontario. "I think the skills that this course teaches are so critical to saving lives that it does make it acceptable."

The course Grant refers to is the Advanced Trauma and Life Support program, the brainchild of American orthopedic surgeon Dr. Jim Styner. In February 1976, Styner crashed his plane, which contained his family, into a Nebraska cornfield. His wife died and his 4 children sustained serious injuries. The local hospital's emergency room staff were so inept that Styner later said he had given his family better care while in the cornfield. The experience



Simulab Corporation

Mannequins are widely used in surgical trauma training in the United States.

prompted him to create a program to teach doctors a standard approach to caring for trauma patients.

The American College of Surgeons introduced the Advanced Trauma and Life Support program in 1980. It appeared in Canada the following year. The course is now widely used and has since become a condition of employment in many emergency departments.

More than a million doctors in more than 50 countries have completed the 2-day course, which consists of lectures, group discussions and a surgical skills practicum. The American College of Surgeons, which still accredits the program, has approved the use of human patient simulators to teach the 4 procedures — chest tube insertion, pericardiocentesis, peritoneal lavage and tracheostomy — that comprise the surgical component.

Four times a year, 16 doctors complete the course at London Health Sciences Centre, which doesn't offer simulators. Instead, participants operate on 4 anesthetized pigs. The pigs are later euthanized.

The centre will try simulators for the first time later this year, says Grant,

who coordinates the course in her region. It has so far stuck with pigs because, until recently, simulators were too expensive, costing roughly \$20 000. They're now more affordable, with leasing arrangements and custom packages making it similar in cost to animal labs, at around \$2500.

Groups that advocate for nonanimal models in medical education, however, claim that expense alone is inadequate justification for not switching to simulators. "It is unquestionably unethical to use live animals for this purpose when there is not only an available alternative method, but an endorsed alternative method from the organization that accredits these programs," says Dr. John Pippin, a cardiologist and the senior medical advisor for the Physicians Committee for Responsible Medicine.

The committee surveyed some 200 Advanced Trauma and Life Support courses in the US, and 90% of respondents indicated they didn't use animals. In Canada, course coordinators determine which model will be used in practicums. Courses in Montréal, Quebec; London, Ontario; and Winnipeg,

Manitoba use animals. In Halifax, Nova Scotia and all of British Columbia, simulators are used. In Edmonton, Alberta, both options are offered.

“I’m really surprised that anyone anywhere running the program would require someone to use animals and not provide an alternative method,” says Pippin.

Indeed, replacement is one of the “3 Rs” that guide the policies of the Canadian Council on Animal Care, the organization that oversees the use of animals in research, testing and teaching in Canada. The other Rs are reduction (using fewer animals) and refinement (causing less distress to animals).

“By and large, if there were acceptable and appropriate alternatives, I think people would run to get them,” says Michael Baar, the council’s assessment program coordinator. “You’re talking about an initial investment compared to having to purchase and look after animals, and all the things that go with that.”

In 2006, the latest year for which the Canadian Council on Animal Care has statistics, 2 535 989 animals were used for scientific purposes in Canada, the vast majority in studies. Only 4% were used for education. The number next to the category “swine” is 37 942, but no breakdown is provided as to how the pigs were used.

Until swine are no longer used in trauma courses in Ontario, some doctors will continue to see their job opportunities constrained.

Dr. Sonia Malhotra, a 29-year-old who recently completed a residency in family medicine at the University of Toronto, needs to complete the course to obtain a rural placement. She’s put it off, though, because of the animal lab. Now she’s considering flying to British Columbia to do the course. “I think it’s worth the price to use 1 less life.”

Dr. Tushar Mehta, who practises emergency and family medicine in southern Ontario, recently attended the course but didn’t receive a certificate because he refused to do the surgical component. Without the certificate, he is ineligible to work in many emergency departments.

Mehta, 37, is a follower of Jainism, an ancient religion of India that stresses reverence for all forms of life. Though he believes training on animals is acceptable in

some cases, he feels he shouldn’t be forced to violate his ethical principles if a valid nonanimal model exists.

“If I can’t do it because of my beliefs, I have no business being in practise,” he says. “I shouldn’t enter the profession if I can’t do what’s required of me, but I put medicine first. But for family and emergency medicine, there isn’t really a need to practise on animals.”



Courtesy of Dr. Tushar Mehta

Dr. Tushar Mehta, a believer of the ancient religion of Jainism, which holds that all forms of life are sacred, says there’s no need for emergency room physicians to practise on animals.

Many other doctors agree, claiming the training needs of surgeons are very different than those of doctors brushing up on trauma protocol. Laparoscopic techniques, suturing, stapling, organ removal and many other skills that surgical residents must master cannot be adequately learned on simulators. But trauma courses are primarily designed to teach emergency management, not to create crackerjack surgeons. It is more about teaching a mindset than a skill set, and that’s why even many surgeons advocate simulators for trauma training.

“It’s not at the level of having real tissue and having a real beating heart,” says Dr. Ross Brown, a surgeon and the director of British Columbia’s Advanced Trauma and Life Support program.

“But given that these are trained doctors, and given that this is really teaching them algorithms and protocols, what in that hour-and-a-half are you going to get out of it? And is it going to make a big difference if it’s an

animal or if it’s another model?”

Some trauma program coordinators have realized that moving to simulators will save them the expense of maintaining an animal supply and the fuss of dealing with animal activists.

Still, some doctors warn that medical educators must tread lightly when changing the way they teach important skills. There is always the risk that adopting a new educational model — whether for economic reasons, political reasons or any other reason — could come at the expense of patients.

“I get nervous when I hear physicians or surgeons or anybody saying ‘ideally, this is the way, but this is good enough,’” says Dr. James Bond, a clinical instructor and the head of thoracic surgery at Surrey Memorial Hospital, in Surrey, British Columbia. “If I’m the patient, I want it to be ‘this is the ideal,’ not ‘this is good enough.’” — Roger Collier, *CMAJ*

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## Close the gap in health, international report urges

No biological reason exists for the dramatic differences in health and life expectancy of people around the world, says the chair of the World Health Organization’s Commission on Social Determinants of Health.

Instead, a toxic combination of poor social policies, unfair economic arrangements and bad politics can be blamed for most of the health inequities, says Sir Michael Marmot.

And around the world these inequities influence all classes. “There is a finely graded relation between people’s social and economic circumstances and their health,” the epidemiologist told a press conference. “People in the middle have worse health than people at the top, but better health than those at the bottom.”

Worldwide, health inequities mean the risk of dying during pregnancy and childbirth is 1 in 17 400 in Sweden but 1 in 8 in Afghanistan, and that a child born in one Glasgow, Scotland, suburb can expect to die 28 years sooner than another born just 13 kilometres away.