

The Making of a Tzu Chi Surgeon

Written by Tang Yau-yang
Friday, 25 January 2008 00:00

*On the operating table he lies, willingly enduring the onslaught of scalpels.
Under surgical lights she stands, making each incision with care and respect.
She helps him fulfill a last dream of devotion; he helps her hone surgical skills and cultivate compassion.
His selflessness guides her in the long and arduous journey of becoming a competent and compassionate surgeon.
It is a long and challenging journey that every medical student must travel.
And Tzu Chi is helping make it easier for them.*



A group of seasoned surgeons reminisced about their humble and often pathetic rookie years. In operating rooms, they had frequently performed menial tasks for senior surgeons. Back then, their only job was often helping set a retractor, sponging blood away, clipping off a suture after the surgeon had knotted it, and some such minor tasks. The group savored the moment when they were finally allowed to close an incision, something enough to keep them excited for a while.

This glacial pace of a surgeon's training has been practiced for decades in most teaching hospitals. They do so because too much is at stake. The patient's life hangs in the balance. In an operation, any task of even the slightest significance is handled with such care that a novice is rarely given the chance to perform it.

Traditionally, trainee surgeons start out by using just their eyes and minds, not their hands. They watch how their teacher surgeons do it, and then they hope they will remember it later.

Therefore, it is a long time before the surgeon has to face the moment of truth, when he himself will hold the scalpel and cut into a patient.

They long for this precious hands-on experience, and yet they dread it at the same time. "Doctor, I'm worried sick about tomorrow's surgery—my first," said the patient. "I know how you feel—it's my first, too," replied the surgeon. Though fictitious, this joke shows how frightening a surgeon's first incision must be.

Unfortunately, at most medical facilities, such first incisions—always unskilled, clumsy, and sometimes incorrect—are made on real patients, who, in effect, become guinea pigs for neophyte doctors to practice and make mistakes on. Hardly fair or even humane, this is nevertheless common practice everywhere, perhaps because no better way is widely available.

Dr. Chen Fu-ming (陳福明), a retired gastrointestinal surgeon in Cleveland, Ohio, and a volunteer with the Tzu Chi International Medical Association (TIMA), recalled his first solo incision after he had opened his own private practice. It was an appendectomy, a minor procedure. "Up till that time," Chen said, "I had always performed surgery under the supervision of a senior surgeon, and I had never felt much anxiety. However, once I was on my own and my fallback security net was gone, I was so scared by such a minor procedure that I can still feel my fear vividly 30

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years later.”

Even an experienced surgeon faces each operation with utmost care and welcomes an opportunity to practice the operation ahead of time. Dr. Li Ming-zhe (李明哲), head of surgical oncology at the Hualien Tzu Chi Medical Center, once had a major operation scheduled. He reviewed related medical literature and, with his eyes closed, did the surgery in his head. He repeated this drill nightly for a week before he actually operated on the patient. Though he did the mental drill cheerfully, that hardly seemed an ideal way.

Fortunately, Tzu Chi has found a better way.

A Tzu Chi exclusive

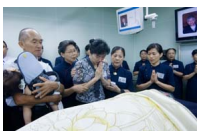
In 2001, Tzu Chi University added simulated surgery to its medical school curriculum. Donated cadavers are used for med students to practice surgical techniques and procedures on. The cadavers are fondly referred to as “silent mentors,” (literally “great body teachers”) whose collective wish for those who operate on them can be summed up as: “Make as many incisions and mistakes as you need on me so you don’t make even a single wrong incision on a living patient.”

Over the years, numerous trainee surgeons have practiced on 81 silent mentors. It turns out that the beneficiaries of the silent mentors’ benevolence include not only medical students, interns, and surgical residents, but also highly skilled surgeons. Dr. Li, for one, certainly has greatly benefited from and at the same time enriched the program.

Li once had to get ready for a liver transplant from a living donor. Instead of going through those highly complicated operations only in his head as he had done before, he now had the benefit of silent mentors. A living donor liver transplant involves operating on two living human beings consecutively: harvesting a piece of liver (usually the right lobe) from the donor, removing the damaged liver from the recipient, and finally implanting the good liver in the recipient. If all goes well, the implanted piece of liver, with its remarkable regenerative power, will be fully functional in 30 to 45 days.

Dr. Li practiced the entire sequence on silent mentors, not just once, but four times, before he actually did the surgery on the two real, living patients. In all, he performed operations on ten persons: first, he practiced on eight cadavers from Tzu Chi’s simulated surgery program, and then he operated for real on two living patients.

What a touching story! No expense, effort, and love were spared here—love and effort from eight body donors, one living liver donor, a persistent surgeon and his whole team—just to enable one recipient to have another chance at life.



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Body donors

Shi Qing-xiu (石清秀), a Tzu Chi volunteer from Kaohsiung, told his family again and again: “When I pass on, don’t bother chanting ‘Amitabha’ for eight hours [as many Buddhists insist on doing to comfort the soul of the deceased and help send it to the Pure Land of the West]. Instead, rush me to Hualien so my dream of becoming a silent mentor can come true. Many people undergo surgery so they can live. I’ll undergo surgery when I die so, hopefully, many others can live.” He was in the terminal stage of lung cancer. He wanted to make sure that his body got into Tzu Chi’s simulated surgery program.

When he passed away, his family called an ambulance and rushed his body to Tzu Chi University in Hualien, where his body was checked and disinfected and put into a freezer to be quickly frozen and kept at minus 30° Celsius (-22°F).

Through October 2008, of the 23,161 people who had signed body donation cards for the silent mentors program, only 594 bodies had been taken into the program [most of those who have pledged are still living, and some deaths didn’t meet the program’s selection criteria]. And of those taken into the program, 295 had been, with the consent of their families, in turn donated to other medical schools to alleviate their shortages. Tzu Chi has used 179 corpses for anatomy classes at its medical school and 81 for its simulated surgery program.

The Tzu Chi Medical Simulation Center

In September 2008, Tzu Chi opened the Medical Simulation Center. The center is located in a building in Tzu Chi University, which is in close proximity to the Hualien Tzu Chi Medical Center.

At the Medical Simulation Center, an operating room is dedicated to the use of simulated surgery. Since the room is intended first and foremost for training, it has all the things that a standard operating room requires, such as dressing rooms, scrub areas, and supply rooms. In short, the room is identical to a traditional operating room in all respects but one: It has eight operating tables as opposed to one, and therefore, eight sets of almost everything else. Therefore, the room can accommodate eight concurrent operations.



Now Tzu Chi University holds regular simulated surgery courses three times a year, in March, July, and November. Three days before a course, silent mentors are taken out of the freezer to thaw. The cadavers, quickly frozen earlier, thaw and become an ideal teaching and learning tool. They are supple and almost identical to living patients except for the absence of heartbeats, blood pressure, bleeding, and breathing.

An auto mechanic thought that changing a car’s engine is like a heart surgeon changing a patient’s heart. So, he asked the surgeon why they did similar work but he only earned a fraction of the doctor’s pay. The surgeon looked at the mechanic thoughtfully and said, “You turn off the engine and change it, but I have to keep the heart pumping while I’m at it.”

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Operating on a living patient is infinitely more complicated than operating on a cadaver, making the former so much harder for a newcomer to learn and do. Simulated surgery on cadavers provides a controlled, realistic, but much more gradual and forgiving environment that facilitates quality learning.

Dr. Sun Zong-bo (孫宗波), head of surgery at the Hualien Tzu Chi Medical Center, pointed out one of the benefits of simulated surgery on cadavers: “For one thing, the surgery can be stopped and resumed at will for instructors to explain a point or for students to correct mistakes and practice repeatedly.”

At some medical schools, medical mannequins and animals like dogs, rabbits, and miniature pigs are used in simulated surgery. The trouble with this is that they are not humans and they have different characteristics. At some other schools, pre-frozen corpses are used in their simulated surgery programs, but they use only body parts instead of whole human bodies. Whole bodies, as it turns out, make the Tzu Chi simulated surgery program stand out from other similar programs.

Dr. Lin Yuan-qing (林元清), an orthopedic surgeon from California and a TIMA member, said of the Tzu Chi Medical Simulation Center, “I’ve visited six or seven simulated surgical centers in the United States, but none is as big and well-equipped as this one. And none offers whole cadavers.”

Some surgeons even praise the center as a world leader in simulated surgery. The center director, Dr. Zeng Guo-fan (曾國藩), plays down the kudos: “We incorporate simulated surgery into our regular curriculum, and we offer whole cadavers for surgery. Both are unique in the world. That’s all.”

At Tzu Chi University, it is part of the curriculum requirements for the persons scheduled to perform a simulated operation to get to know the life and family of their silent mentor. They read up on the body donor’s life and spend time with his or her family. By the time of the surgery, the students already know much about the person on the operating table. The cadaver in front of them is of someone they know and respect—a whole person who had a name, a life, a family, feelings, and emotions—not just a lifeless body, and certainly not just a body part like a wrist or a knee from an unknown source.

It is no wonder that Tzu Chi trainee surgeons conduct the surgery with utmost care and reverence. This intimate patient/surgeon relationship truly sets the Tzu Chi simulated surgery program apart from all the rest. Though the corpses are cold, the kinship is warm and personal. The surgeon therefore performs the surgery as if on a loved one. This warmth later radiates from the surgeon outward to future patients. This is yet another example and manifestation of Tzu Chi’s somewhat vague and highly impalpable ideal of bringing up not just competent, but also loving, surgeons and physicians.

A four-day simulated surgery training course: days 1 and 2

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A group of interns and instructors trickled into the center soon after seven in the morning. A four-day simulated surgery training course was about to start.

They changed, scrubbed, and suited up for the surgery ahead. Although simulated and on a cadaver, the surgery was nevertheless carried out as if it were on a real, living patient, with all the i's dotted and all the t's crossed every step of the way.



Eight silent mentors lay still on the operating tables arranged throughout the large mock operating room. The interns, instructors, and their support teams stood around their assigned tables and had a moment of silence to thank the silent mentors, whose photos and brief biographies were displayed on monitors hung near the operating tables.

Then they removed the Buddhist blankets from the dead and covered the corpses with hospital issue green sheets for surgery, exposing only the immediate areas to be operated on.

Dr. Yang Fu-lin (楊福林), division head of the surgical ICU, Hualien Tzu Chi Medical Center, was one of the instructors. Under his direction, an intern made a one-centimeter incision between two ribs, put on a retractor, and poked her finger into the opening, probing deeper and deeper. Then she inserted a chest tube and a trocar into the cadaver. This chest tube insertion that she performed is one of the most elementary surgical techniques. Dr. Yang gave every intern an opportunity to perform this simple but potentially life-saving procedure.

Normally, the pleural space, between the chest cavity and a lung, has just a little serous fluid and no air. When the pleural space accumulates air or excessive fluid that displaces and compresses the lung, the person could develop pneumothorax (collapsed lung) or hydrothorax. This can be life-threatening if the patient can't breathe. A timely chest tube insertion to let out the air or fluid can save a patient's life.

While Dr. Yang's group was busy with their tasks, other groups were also focusing on theirs. For example, at another table, orthopedic surgeon Wu Kun-ji (吳昆吉) guided his group of interns through femur traction for bone fractures. Throughout the day in the large room, participants worked through quite a few other procedures, such as peritoneal lavage, cystostomy, appendectomy, tracheostomy, laryngeal mirrors, venesection, and craniectomy.

The first day ended two hours before midnight. The participants did still more hands-on training all through the next day until that night, when each intern had to take an examination, performing under the instructor's watchful eyes every procedure that they had practiced in the previous two days.

Although each silent mentor, by this time, had already been through several operations in various parts of her body, she just lay there silently and—if she could still think—looked forward to the next two days with a different, more experienced group of physicians.

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A cadaver's busy new life: days 3 and 4

The second half of the program was for resident and attending surgeons to practice a wide spectrum of surgical procedures. A few of them had come from other countries, from medical institutions not related to the Tzu Chi Foundation.

In the few years since its inception, the Tzu Chi simulated surgery program has attracted the attention of members of other medical institutions. Some of them, like Shanghai Jiao Tong University and the University of Queensland in Australia, either visited or applied to be trained in the program. Indonesia has so far twice sent the largest contingents, which included faculty, physicians, and students from Universitas Indonesia and Cipto Mangunkusumo Central Hospital, Jakarta.



Many highly experienced surgeons also participated to help guide students. A course on liver transplantation was led by Dr. Yin Wen-yao (殷文耀), head of surgery at Dalin Tzu Chi General Hospital. He impressed the importance of great care in surgery upon those learning at his table. "The slightest slip of the scalpel could cut a blood vessel and cause a great deal of bleeding," Yin warned his group.

Drs. Chen Ying-he (陳英和), superintendent emeritus of the Hualien Tzu Chi Medical Center, and Yu Zai-jiu (俞在九), head of orthopedics at Taipei Tzu Chi Hospital, worked at the orthopedic surgery table. They led their group through various orthopedic surgical procedures on joints, radii, cervical vertebrae, thoracic vertebrae, and lumbar vertebrae.

Dr. Wu Chao-qun (吳超群), head of general surgery at Taipei Tzu Chi Hospital, guided his group through two gastrectomy operations. First, in the morning, they practiced a traditional, invasive approach, making large incisions in the abdomen; this was followed in the afternoon by a laparoscopic approach on another silent mentor. Endoscopic techniques, which are now in wide use in many countries, were an integral part of this class.

Dr. Li Yuan-jie (李元杰) watched Dr. Xu Zheng-xian (徐正賢) perform a corneal transplant. Li is an attending ophthalmologist and Xu a resident at the Hualien Tzu Chi Medical Center. Li said that he could not let Xu practice on a living patient, and that it was a really rare and precious opportunity for Xu to perform such an operation from end to end. Xu said, "I could only watch an operation with my eyes, and now I can do it with my own hands. I'm really grateful."

Retrospect—end of day 4

The course ended late in the afternoon of the fourth day. The silent mentors had each received countless cuts and helped each participant, whether student or instructor, improve either their

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surgical skills or their compassion—or most likely both—to higher levels.



With such newly acquired capabilities under their belts, participating interns carefully and respectfully—clearly the only prevailing attitude all throughout the course—sutured each silent mentor back into a whole person again, much as it had been at the outset of the program. This step, like all the preceding steps, is important in cultivating the students' respect and love for the mentors, which, by extension, spills over to their future patients.

Professor Wang Yue-ran (王岳然), head of the Department of Anatomy at Tzu Chi Medical School, then checked each table's work in detail, making sure that each silent mentor had been restored appropriately. With Wang's final nod of approval, the surgeons and students clothed their mentor all in white: thermal underwear, socks, gloves, and a long gown. Then they covered each mentor with a Buddhist blanket for the dead and gently lowered him/her into a casket.

Several people shared their thoughts. Chen Meng-fang (陳孟芳), an intern, said to her mentor, "Teacher, I worked really hard on you the last few days. I hope I didn't let you down. The gratitude I have for you will help propel me forward on this long and arduous path to becoming a competent and caring doctor."

Dr. Fauziad Fardiza, a 6th-year ENT resident physician at Cipto Mangunkusumo Central Hospital, Jakarta, said that he had never performed any operation like this, which he cherished dearly. "I am grateful to the mentor for his donation and to his family for their consent to carry out the mentor's wishes [to donate]."

Intern Lin Zhong-qing (林宗清) said that he and his mother had signed body donation cards when he was a fourth-year medical student. Dr. Yang Qiu-fen (楊秋芬), also an intern, told the gathering, "When I die, I want first to donate my organs for transplants. Failing that, I want to donate my whole body for medical education."

Dr. Zeng Guo-fan, director of the Medical Simulation Center, echoed their sentiments: "I've been teaching anatomy all my life, all with my mouth. However, in my final anatomy class, I'll be teaching with my own body. I've told my family, relatives, and friends about my wish. I want them to understand and honor it. I hope that when I die, one of them will call the center for me and effect the donation because by then I won't be able to make the call myself." (Editor's note: It is not uncommon for the family to have second thoughts after the death of the donor. Many planned donations have fallen through as a result.)

"I must keep up my regular workouts lest the future students who operate on my body complain that I have too much fat," Dr. Zeng joked. And that is certainly a new incentive to stay on a fitness regimen.

Mission completed

The eight silent mentors were cremated the morning after the four-day program. In a solemn

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ceremony in a light drizzle, the program participants accompanied the family members to lay the silent mentors to rest.

Huang Xiu-hou (黃修后) thanked her husband, Lin Guo-jin (林國金), one of the silent mentors. “Though you are gone, you have given me two new physician daughters and one physician son through your body donation. Thank you.” Dr. Chen Fu-ming of Cleveland said to the gathering, “The silent mentors have taught me the true essence of giving.” Intern Chen Yong-zhi (陳永志) said, “I started the course dreading even the most basic incisions. It was only through my silent mentor that I now feel quite comfortable with my scalpels.”

The photos and ashes of the great teachers were placed in the Hall of Great Giving, in the same building as the Medical Simulation Center, for all to view and pay their respects to. The silent mentors have indeed set valuable examples for all to follow.

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