One Friday evening in early December, after trying to recover from the exertions of a night spent in the Intensive Care Unit (ICU) of a big private hospital in Delhi (where I take care of critically ill patients six days a week, about 47 weeks in a year), I walked into a Barista outlet for a cup of coffee and picked up a leading news magazine. One of the main stories in that issue was about this ‘new’ technique of cardiac surgery which was being introduced in a major cardiac center of the city. The hero of the piece was obviously a very famous cardiac surgeon of the city and country who had trained and worked “extensively” in the US. The article was hard pressed to prove how ‘new’ the technology was – it had been introduced in the US “just six months back”. What was even more interesting for me was that another weekly also carried a very similar article on the same procedure, with very similar points being stressed. Both the articles spoke about how precise the technology was, how the surgeon did not touch the patient at all but operated through very precise robotic arms “which took away the minutest tremors of the surgeon’s hands”. It spoke about how the incisions were very small compared to the “large incisions and spillage of blood and gore” during conventional open-heart surgery. I am no proponent of the ‘old is gold’ adage, and I do not doubt that this procedure when mastered actually causes much
less post-operative pain and discomfort to the patient and possibly requires a somewhat shorter stay in hospital.

However, what is interesting for me as a doctor (who works in the ICU, with a high concentration of modern technology) is how easily a cardiac surgeon, renowned for his fantastic hand skills, was ready to give up that reputation. Instead, the robot had been acknowledged as far more capable of making surgery safe and sure, free from the slightest of tremors. I am very sure that before the introduction of this robotic technique journalists would have been hard pressed to make him accept that his fingers had even the faintest of tremors! But even he, the Indian avatar of the God of Cardiac Surgery, was ready to bow down to the God of Technology and accept his human frailties.

Surprisingly, the article did not raise any questions about this new procedure. Questions about the percentage of patients who have to be taken back for surgery due to complications during the first surgery, about re-blockage of the arteries that were used for the bypass as compared to conventional surgery, and many others. There was an attempt to juxtapose precise sanitised robotic surgery (where the surgeon is “gently humming under his breath”) against the confusion and “blood and gore” of conventional surgery – the popular film and television image of the surgeon with an intense expression on his face and the sweat being wiped from his brow by a nurse. Those were the good old days of ‘seat of the pants’ kind of tough surgery. Does it make me nostalgic or what?

I finished my cup of coffee and walked out of Barista into the bright city lights. I crinkled my eyes against them, squared my shoulders and walked to my car – there I was, the last stand of the clinician against the onslaught of technology! I got into my car and was driving back home when I remembered an earlier incident in the ICU.

It was another night on call, in October. We had our hands full with twenty-two sick patients when I got a call from the Casualty Medical Officer (CMO): a patient who had reached Casualty following a car accident was having difficulty breathing and was sinking. I rushed to the casualty accompanied by my senior resident, Dr. Rakesh Gupta. The accident victim was a well-built man of 28-30 years who had been out driving with his friends when his car banged into a stationary van near India Gate. His friends had escaped with cuts and bruises but he was behind the wheel and had got crushed between the seat and the steering wheel.

When we examined him, his chest was moving in an odd way and his breathing was laboured – seemed like fractured ribs on both sides of the chest. His pulse was very feeble and his blood pressure was just 70 mm Hg systolic (normal range is 110-140 mm Hg). His heart was beating very fast and he was moving in and out of consciousness. He didn’t seem to have any major injuries on his face and head – but one couldn’t be absolutely sure on cursory examination.

I asked for a spine board to be put under him so that his neck could be kept stable – if his neck was broken, any movement could completely paralyse him by injuring his spinal cord. We were giving him oxygen through a mask. A nurse was trying to put in a catheter to infuse him with intravenous fluids as his blood pressure was low and sinking, but she was finding it difficult to find a vein as his blood flow was poor. His heart rate on the Electrocardiograph (ECG) was getting faster and the size of the ECG was getting smaller. There
could be two reasons for this – either there was blood in the sac around the heart (i.e. the pericardium) or the fractured ribs had punctured the lungs causing air and blood to collect in the pleura (sac around the lungs), which was pressing on the lungs. This would make it difficult for him to get enough oxygen. The pressure transmitted from the lungs was probably also squeezing the heart, and making it difficult for it to pump.

The heart was further compromised by the lack of blood flowing back to it, and the patient seemed to be losing blood somewhere. All this took about a minute to assess. Rakesh managed to find a vein in the patient’s forearm. I asked them to pump fluids into him. We had very little time and very few choices. Either we put a tube down his trachea (wind-pipe) to give him artificial respiration and improve the oxygen levels in his blood, or push two tubes into his chest (chest tubes) on both sides to release the pressure on his lungs and heart. The latter would help the heart pump more easily. Both the procedures had their problems. In the first case, the oxygen leaking out into the pleura due to the artificial respiration through the tracheal tube could increase the pressure on the heart and make it stop. On the other hand, the chest-tubes would take longer to insert and the lack of oxygen during this time could also stop the heart as well as cause brain damage.

The decision was taken out of my hands. Suddenly, the patient took a last desperate gasp and stopped breathing. The pulse-oximeter showed very low oxygen levels and the patient turned blue. I asked for the AMBU bag to give artificial respiration. I had no choice now but to put in the tracheal tube. As I put in the tracheal tube, I asked Rakesh to push two large-bore I.V. needles into both sides of the patient’s chest. That would help release some of the pressure from the heart while I was giving him artificial respiration and buy us time to put in the chest-tubes. I gave him a few small breaths from the AMBU bag – the lungs inflated a little. Then suddenly the ECG became a flat line – Shit! His heart had stopped! The CMO jumped up and began pumping the chest with his hands to keep the heart pumping artificially. Rakesh shouted, “Sir, there is a tamponade, we need to put in the chest tubes!” “Yes, yes!” What we had feared had happened. Despite the large-bore needles in the chest, the pressure from the artificial respiration had increased the pressure on the heart, already compromised by the lack of blood flowing back to it, and had made it stop.

As Rakesh was preparing to put in the chest-tubes, I stopped giving the patient artificial respiration. The heart was at a standstill and the patient had no respiration. Something had to be done quickly. “Come on Rakesh, the chest-tube.” Rakesh was calm and concentrated as he found the right space to shove the chest-tube in – there was a rush of air and blood as the chest-tube slotted into place. “Keep giving cardiac massage!” we shouted to the CMO. “Nurse, adrenaline and atropine intravenous immediately!” I started giving small artificial breaths to the patient. “OK Rakesh, chest-tube on the other side?” Rakesh was cool and unflappable - in one smooth strong movement, he pushed the other chest tube in, another gush of blood and air. Now I could ventilate the lungs much more easily.

Now to get the heart pumping again. “Nurse, another adrenaline and atropine! Pump him with fluids – he is losing blood somewhere!” The ECG monitor showed some activity of the heart, ventricular fibrillation – it had started making small contractions, not enough, but at least there was some electrical activity. “We need to shock him, sir”, said Rakesh. I said “200 joules”. He put the defibrillator’s paddles on the patient’s chest, adjusted the energy
level and delivered the shock. "We got a rhythm back sir! We got a rhythm back!" "Keep pumping fluids in." “Sir, we got a pulse, we got a pulse!” screamed the nurse. “Start dopamine to keep the blood pressure up and pump him with fluids. Find another intravenous line." “Yes sir!” There was a smile in the voice. We had got him out - he had been dead for all practical purposes for one to one-and-a-half minutes. But he wasn’t out of the woods yet.

We shifted him to the ICU. I asked the CMO to talk to the friends and relatives. I had no time. It was going to be a long night. The patient wasn’t conscious yet. I tried to call out to him and assess if he had regained consciousness, but in all the tension we had forgotten his name! After shifting him to the ICU we had to stabilise him or else he might arrest again. We put in a central venous catheter (a tube, the thickness of a fine pencil) into a deep vein in his chest, close to the heart, to assess the pressures on his heart, so that we could pump in I.V. fluid and blood accordingly. We put an arterial catheter (a fine plastic tube) in his radial artery (an artery in the arm) to monitor his blood pressure (BP) more effectively. Emergency blood was arranged and given to him, but his BP remained low.

Surgeons and neurosurgeons were then called in. There seemed to be some bleeding in his abdomen and we needed an urgent CT scan of the abdomen and chest to look for any other injuries. A CT scan of the head and spine was required to assess injury to the brain and spine.

I called out to him, “Ajay, wake up, open your eyes!” His eyelids fluttered but didn’t open fully. I pinched his hand - he grimaced and moved it away. He seemed to be waking up, but how much brain damage had been sustained due to the lack of blood when his heart had stopped was difficult to say. We called in his brother and parents to meet him and to tell them about his condition. As they came in, I explained to them that Ajay was much better, but not totally stable. That we needed to give him more blood, and needed to do CT scans of almost his whole body to assess the extent of his injuries. I showed off all the gadgetry with which we were monitoring him. An arterial line in his artery for his blood pressure, a central venous catheter for filling pressures in the heart, a pulse oximeter for the oxygen levels in his blood, an ECG monitor, a carbon dioxide monitor, a urinary catheter for his urine output and kidney function and a ventilator which was helping him breathe. I guess I showed them all this because I felt better able to reassure them through technology than through the clinical skills of our nurses and doctors. My hunch was that this monitoring made them feel secure that every aspect of their son/brother’s body had been accessed and was being monitored.

The CT scan of the head and spine showed no injury, but the scan of the abdomen showed that he had sustained an injury to his liver, which was bleeding. We had to transfuse him with eight units of blood and four units of plasma. The CT scan of the chest showed multiple rib fractures and some contusion to the heart muscles. The injury to the heart muscles was causing his heart to pump less hard and required some medicines to pump normally. But the liver injury had to be operated.

At 4:00 am Ajay was taken for surgery. The surgery required all the skills of the surgeon to excise almost a quarter of the left side of his liver, and all the skills of the anaesthetist to keep him from having another cardiac arrest during the procedure. Ajay was brought back to the ICU at about 10:00 am. We hooked him up to all the lines, tubes and catheters
which monitored and supported all the systems of his body. His bleeding from the liver and lung injuries had slowed down but still required blood transfusions, though less and less. I drove back home around one o’clock in the afternoon and fell asleep, dead to the world.

Ajay was making slow but sure progress. He required less medication to support his heart and kidney functions and almost no blood and plasma transfusions over the next week. Although he was fully conscious, the worrying part was that his lungs were badly affected due to the injury and the massive amount of blood we had transfused. He was still on the ventilator. Every day we decreased the amount of support and oxygen that the ventilator was giving him. The longer the breathing tube remained inside and he was on the ventilator, the greater the chances of lung infection. We had put in a fine plastic catheter close to his spinal cord (epidural catheter) and were giving him analgesics through it so that breathing did not cause him pain. We didn’t want to use the intravenous route to give him analgesics because the high doses required to relieve the pain from the rib fractures would put him into deep sleep and depress his own efforts to breathe.

Every day we called his parents and brother in, and showed them all the parameters on the monitors, ventilator and blood tests, and assured them that he was getting better but was not totally out of danger. Over this period of a week or more they learnt what parameters to ask and look out for on the monitors to assess his recovery on their own. Everything boiled down to numbers on a monitor or chart. It didn’t matter that the nurses had taken such good care of him that he had no bedsores and no lung infection. That they had kept each of the invasive monitoring lines and support systems absolutely free of any serious infection (more than a quarter of patients who die in ICUs all over the world die of severe infections acquired in the ICU, which further complicate their already compromised body physiology). That they had helped to keep him cheerful and in a positive frame of mind.

About ten days after this accident, I was on night call again. Over the last ten days we had tried to reduce the support from the ventilator – it was a difficult back and forth process. (Unlike what Bollywood would like us to believe, after a serious accident the hero doesn’t sit up immediately following a ‘successful’ surgery - all cheerful and perky! It is a slow and difficult process.) Finally, the decision had to be taken to take him off the ventilator and take out his breathing tube. I watched all the monitoring systems as I put him on minimal support on the ventilator. He seemed to be doing fine. “OK. Let’s extubate him.” We took out his tracheal breathing tube and put him on oxygen by a mask. He heaved a sigh of relief. He was sick of not being able to speak. We watched him on the monitors for any signs of distress. He seemed to be fine. We heaved a sigh of relief! But we had to watch him carefully for a while. I chatted with him. The nurses and other doctors came and congratulated Rakesh and me – he had been our ‘save’. It felt good, really good!

Suddenly from the corner of my eye I saw somebody trying to catch my attention from the next cubicle, separated from us by a glass pane. It was Nurse Jeesha: she was indicating that her patient had no BP and pointing to the ECG monitor – the patient’s heart was slowing down! I mouthe the letters “D-N-R” (Do Not Resuscitate). There was no point doing anything for that patient – Naseem Bano. She was a case of end-stage disseminated tuberculosis. She had been with us in the ICU for the last 50 days. Nurse Jeesha looked down and shook her head, and then looked up again, staring at me. I repeated the letters
“D... N... R”. Woman, don't spoil my evening – I have just saved this young man from near death! Don't try to make me feel bad for not doing anything for a patient for whom we have not been able to do anything in the last 50 days.

Naseem Bano was a 23-year-old girl from a village near Meerut. She was married four years ago but couldn't get pregnant and had been losing weight and weakening. Her husband took her to Meerut where she was diagnosed with disseminated TB, which had also affected her uterus. She began taking anti-TB medicines, but after about three weeks of treatment with multiple drugs she continued to worsen. She seemed to have a resistant type of TB. About two months back she became unconscious, started having seizures and went into a coma. The TB had affected her brain. She was taken to a hospital in Meerut, but her coma didn't improve. Meanwhile she had also acquired serious secondary infections of the lungs and the bloodstream, which further affected her kidneys. Fifty days ago she had been brought to our ICU. She had to be put on a ventilator and multiple support systems but her coma deepened, and her other body functions deteriorated. She was beyond hope.

Her father had sold his land to pay the bills in our ICU – it had crept up to almost Rs. 4.5 lakhs and he was nearly bankrupt from the loans. I looked at Ajay and smiled. He smiled back a tired smile. Then I walked over to the next cubicle. Nurse Jeesha’s eyes were filling up. She was young. She would learn and get tougher. Hadn't I become tougher in the last twelve years that I had worked in various ICUs? She would learn that some patients cannot be saved. But for now she felt terrible. The nurses had worked hard on Naseem. They had massaged her and exercised every part of her body. They had kept her clean and battled every source of secondary infection. Naseem had no bedsores in the 50 days she had been with us and looked nearly as well preserved as she had the day she came in. Her heart slowed down even further. Jeesha tried desperately to find her BP – there was none. Her eyes pleaded with me to do something. I shook my head, “There is nothing we can do Jeesha, she is in an advanced stage of resistant TB. Let her go!” Another one added to the list of 500,000 who die of TB every year in India. Another one added to the statistics, because we lacked research to find better drugs against resistant TB. Her heart stopped. Nobody moved to give her a cardiac massage or any medications to bring back her heart. I was in-charge and I had said “No”. I had made my peace with Modern Medicine.

NOTES
1. Blood pressure is measured in millimeters of mercury (Hg). The higher pressure is called systolic and normally ranges between 110-140. The lower pressure is called diastolic and normally ranges between 70-90.
2. Instrument that measures the oxygen in the blood.
3. A life-threatening condition in which pressure around the heart leads to its compression and decreases its ability to pump. It can be due to the collection of fluid or blood in the sac around it (pericardial sac) or due to transmitted pressure from large amounts of air or blood collected in the sacs around the lungs (pleural sac).
4. An abnormal irregular heart rhythm in which there are very rapid, uncoordinated fluttering contractions of the ventricles (lower chambers) of the heart that are ineffective in pumping blood out of the heart. It’s a life-threatening situation.
5. Another name for a bruise. It is caused when superficial blood vessels are damaged or broken as a result of a blow, and leak out into the tissue.