

Meet the Mark III Robot:

A Robotic Surgeon Backstory

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The Surgeon in the Mirror introduced the Mark V surgical robot and its powerful AI. But that model was actually the third generation of systems introduced by Intelligent Surgical Robotics Inc. (ISR). Their first model was labeled the Mark III and did not contain an intelligent AI. Instead, it used very primitive “A-steps” to assist the surgeon with simple repetitive motions.

In this backstory, we meet Dr. Anil Patel as a young surgeon just starting his practice; Jerry Blanchet, the CEO/Founder of ISR, a new robotics company hoping to make it big; and Sudhir Chowdary, a young computer scientist, hoping he’s made the right career choice in joining ISR.

This story was actually one of a series of flashback scenes in an early draft of Book 1. I wanted to show ISR breaking onto the robotic surgery scene with a new technology that was powerful enough to launch a medical device company. After discussing this with both of my editors, we agreed that these were interesting, but they interrupted the flow of the main story. So, they fell on the cutting room floor. But never throw anything away. I have an outline to turn these and several more into a full-length prequel novel.

If you’re asking, “What about the Mark IV? Did you skip it?” You’ll have to stick around and find out, along with everyone else.

For now, consider this a teaser in the **Robotic Surgeon** world. I hope you enjoy it.

Chapter x. Chapel Hill Medical Center

“Come on, let’s go to Boston.” Anil was coaxing Ben to join him on a trip to the invite-only event at Intelligent Surgical Robotics.

“I’m not sure that’s how I want to use my rare days off. Besides, what if it is just a big sales pitch? We can’t buy stuff for the hospital.”

“It’s not. Sudhir says they’re going to reveal an entirely new robot... and, wait for it... the robot is smart just like I’ve been talking about. Maybe we’ll be the first to use it.”

“So, you want to be the guinea pig? I’d rather wait a few years to see whether anyone buys the robot to begin with. Sometimes guinea pigs get roasted for supper.”

Anil tipped his head sideways at that comment. “I don’t think that’s a thing. We eat some weird shit in India, but I never heard of anyone eating a guinea pig.”

“You know what I mean.”

“You mean that you’re chicken? We have to take a few risks if we want to get to the top of the pile in this field. I want to be on the top of the pile.”

“Fine, you go. Then come back and tell me if I need to jump on this robot, or wait for the next ten that will come along.”

“Fine. I’m going.”

“Then, go.”

“I am.”

“Good.”

“I’m already gone.”

“Then why can I still smell you?”

“I’m not here. I didn’t hear that.”

Anil walked down the hall, hoping this was the right move. If this robot was a big deal and he could become an early user, it would set him up for life. He could be the best of the best in a new wave of surgical tech. Or he could become a roasted guinea pig dinner.

Chapter x+1. ISR Boston

Anil sat in a corner with two engineers. One was Sudhir Chowdary, who had arranged his invitation. The other was a biomedical engineer named Chris something. They were discussing the finer details of a prostatectomy. Both of them were so well versed that he could have been talking to a couple of his clinical colleagues. They knew the anatomy. They knew the procedure. They knew the outcomes. They knew the literature. He was impressed.

Once they got through the superficial details, they wanted to hear details about how he made decisions during a procedure. How did he see and select tissue planes to move through? When would he use energy and how much? Could an instrument with a new shape or blade improve his performance?

Each of them had a tablet computer that they used to show him videos of surgeries on the newest animated manikins. These looked even more realistic than cadavers. The instrument tips on the screen moved quickly and to precise points.

“Have these videos been sped up just to illustrate your point faster?” Anil asked.

Sudhir smiled, “No, this is real-time speed.”

“Impressive. Whoever this is, they’re very talented. Can they do this with the Talos robot too? Or does this kind of speed only come from your new prototype?”

“It can only be done with our machine. We called it Dash during development. But they will announce it tonight as the Mark III robotic surgical system.”

“Three? So that implies that the Talos was generation two. What do you consider the first generation?”

“Last century, the very early Zeus and Aesop are gen one. They didn’t have a long shelf life like the Talos, but they were important milestones in launching this entire field,” the biomed answered.

“Those were long before my time. But I’ve seen them in a surgical museum in France. Primitive. It was amazing that patients consented to using them.” Looking back at the video, Patel went on, “How does your machine make it possible for a surgeon to tie a knot that fast? I’m not sure my hands can dance at that speed.”

“That, Dr. Patel, is the secret sauce. We can’t go into details tonight. But if you agree to join our clinical trial program, you’ll see how it’s done and a lot more.”

That was intriguing. They were not making empty promises. They were showing actual performance. He looked around and saw a half dozen similar little clusters of engineers and surgeons in the room. All of them were heads-down watching video on a tablet. They were getting the same pitch. He could either walk away and stay with the standard course of his practice, or he could jump in with both feet. A cautious stance would leave him some place in the middle, unable to excel in either world.

He imagined Ben’s career on the Talos compared to what his own might look like with this new machine. Ben was making a big mistake.

He already knew the minds and attitudes of several of the older surgeons in the room. They wouldn’t risk their established careers and reputations on a new robot until they were one hundred percent certain that it would be a hit. By that time, it would be too late to make a name with it. There were also younger surgeons with no reputation to put behind the robot. By pure luck of the calendar, he was at the right place in his career to both help ISR with its new product and to gamble his career on something new.

If he went in too deep and this technology flopped, it would be a setback for him. It would put lost years on his resume, but he could recover. On the other hand, if this was the next big thing, it could transform his practice and his life.

“It’s better to fail in originality than to succeed in imitation.” Where had he read that quote? It sounded like something that John F. Kennedy or Winston Churchill would say. Succeeding in imitation could be extremely lucrative if it was the right field. Maybe a revision of that quote would be more appropriate, “Better to succeed in originality than to fail in imitation.” Yes, that sounded much better. That was really what he was looking for.

Sudhir tapped him on the shoulder. “Dr. Patel, the main presentation is about to start. You might want to find a closer seat.”

While they had been talking and watching videos, the stage curtain had been drawn back. On the stage was a large black box with a drape over the front. It was no secret what was hidden inside.

Dr. Jerry Blanchet strode onto the podium and took up the microphone. ISR was his company and this was his party. “Welcome to our little reception. I hope all of you are having a pleasant time. And I hope our staff has piqued your interest in our little project. As CEO of Intelligent Surgical Robotics, I couldn’t be more proud of our team and more excited by what they’ve been able to create. Most of our guests will have seen the videos that the team is sharing on their tablet computers. Did those look unusual? Exceptional? Maybe even exciting?” He paused to let the audience absorb and react.

“Well, videos are nice. But we want to show you a bit more. Tonight, we’re privately announcing the Mark III surgical robot. The technology is almost finished. We’re going into clinical trials soon. We need surgeon champions to work with us. We think the most promising partners are in this room tonight. We want to show you the tip of the iceberg. There’s a lot more

beneath the waterline, so to speak, that we can reveal later. What you are about to see is covered by the NDA that you signed before coming here tonight.”

“Let’s meet the Mark III.”

With a flourish, a pair of black-clad stagehands whisked away the cover to reveal the tips of four surgical instruments protruding from the black box. They were poised over a partially dissected, animated manikin. Spotlights were trained on the instrument tips. The image was projected on a wall-sized monitor so everyone could see every detail.

The instruments were beautifully made. Anil could see that they were rigid, but also multi-jointed. His eyes ran up the shafts to where they disappeared into the box. Clearly, the company had constructed this specifically to reveal only a small part of the machine. Running his eyes down the shafts to the tips, he noticed that the last several centimeters contained at least two joints. This meant that most flexibility would be performed at the ends of the instruments inside the patient. It also meant that the robot’s upper arms could be smaller and would not have to swing as wildly as the current machines did. Very interesting.

Music gradually filled the room as the instruments traced circles and ellipses in the air. He noticed that the instrument shafts weren’t straight. Each had a slight curve to it. He had faced several surgical situations where a slight curve would have been a big help in getting to his target.

The shafts were a deep maroon color that reflected the light in beautiful patterns. Clearly, someone at ISR had a talent for artistic design as well as engineering.

For nearly a full minute, the instrument tips danced their pattern while powerful classical music played from the room’s expensive audio system. It was mesmerizing. The audience was caught in the spell, watching silently.

Then Blanchet’s voice came gently into the room. “We’ve been working on the Mark III robot for almost a decade. Today, we have everything in place. Today, we’re ready to bring a few of you into a partnership for clinical trials. We think you’ll find this machine unique from anything you’ve seen before. Would you like to see some of its tricks?”

Gentle and universal applause from the audience.

“We have a surgeon at the controls. She’s not here in the room with us. But she can see us and hear us. Let’s ask for a few simple tasks.”

“Annie, the manikin on the table has several incisions already placed. Can you select one of them and just close it with a running suture?”

One of the robotic hands was already holding a needle and suture. It and a second hand moved gracefully into position over an incision. Patel noticed the speed with which it moved toward the manikin. Almost as if it would impale the tissue. But then it stopped just millimeters from the surface. The robot worked with one instrument stabilizing the tissue, while the other threw the needle through the two layers. It was a basic maneuver. Something that any surgeon here mastered years ago. But the instruments did it so fast that everything was a blur. In fact, the instruments had made three throws through the tissue in what seemed like the blink of an eye.

Everyone in the room was murmuring. Not sure that they had really seen this. How could anyone’s hands move that fast? The robot paused for a couple of seconds so everyone could see that the throws were perfectly placed.

Then the robot secured the end with a knot. Like the throws, it seemed to materialize in thin air. One second it was not there, then a blur, then a finished knot.

A much louder murmur through the audience.

Blanchet, "So, what did you think? Would this be useful to you?"

Patel was the first to speak up. "Sir, how can a human surgeon possibly move that fast? And be that accurate?" He was not shy about questioning the outrageous claims of medical device salespeople.

Smiling, Blanchet had expected this question. In fact, the entire demo had been designed to elicit it. "That's part of the secret sauce. Human and robot working together to accomplish something that neither can do alone. Annie, our remote operator, is very talented. But no more so than all of you. She's learned how to take advantage of the capabilities of the machine."

Another voice asked, "How do we know that what we just saw was not done by some industrial robot on a programmed path? Maybe that was a robot that assembles parts in an electronics factory."

Still smiling, Blanchet had expected this as well. "You would be right that the automated speed and precision of manufacturing robots inspired us. We asked ourselves, 'How can we put that speed and precision into the hands of a surgeon?' and we have found an answer."

Blanchet went on, "Please step up onto the stage and reposition the manikin. There's also a scalpel on the table if you'd like to change the incisions or create your own."

Dr. Jeremiah Yarborough, a very prominent surgeon from Cleveland Clinic, stepped onto the stage and did some work on the manikin. Then stepped back and nodded.

"Annie, can you simply close the incision that Dr. Yarborough has made? And show us something new this time."

The robot's instruments danced rapidly through space and the giant image on the wall showed the incision closing up under a blur of motion. This one had been diagonal to the orientation of the robot and not completely straight, a little zig-zag in the middle. When it finished, they could see that the incision was closed with a series of discontinuous throws and knots. It was certainly the right thing to do for an incision like that, but the speed with which it happened was unbelievable.

This time there was no murmuring, just silence.

"The machine has a few more tricks to show off this evening. But let's enjoy the party for a few minutes before we get to those."

Anil was impressed. "Sudhir, do you have those agreements?"

"Yes, Dr. Patel, right here on the tablet."

He waved for the engineer to hand it over. He signed his name almost as fast as the robot had closed the incisions.

He knew he had seen the real thing. He wanted in before anyone else. This would change surgery. It would change his life.

PostScript

Other chapters in this flashback sequence reveal the details of how the robot performed the magic on stage that night. The technology described in those is just a stones throw into the future from what really exists today in 2023.

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Books 2 & 3 will be released in late 2023.