

[music]

CHILD 1: When I grow up, I want to be a firefighter.

CHILD 2: I want to be a YouTuber.

CHILD 3: I'm seven years old. I want to be a doctor when I grow up because I can cure the sick people.

[music]

SHAWNE MCKEOWN: Ray, what words come to mind when you think of the health care system?

RAY HARRIPAUL: Bed pan.

SHAWNE MCKEOWN: Wow. Bed pan.

RAY HARRIPAUL: Bed pan.

SHAWNE MCKEOWN: Okay.

RAY HARRIPAUL: I know you said-- you said word but more words--

SHAWNE MCKEOWN: No, word, words.

RAY HARRIPAUL: But bed pan, literally.

SHAWNE MCKEOWN: Okay. Bed pan.

RAY HARRIPAUL: What about you though? What do you think of when you hear healthcare?

SHAWNE MCKEOWN: Um...the first thing I think of is wait times. Take a guess. How much time do people spend on average waiting in an emergency room before they're admitted?

RAY HARRIPAUL: Two, three hours tops? Longer?

SHAWNE MCKEOWN: Yeah.

RAY HARRIPAUL: Like, how much longer? Double that time?

SHAWNE MCKEOWN: Oh yeah. Double it.

RAY HARRIPAUL: Six hours?

SHAWNE MCKEOWN: M'hmm, more.

RAY HARRIPAUL: Like a work shift? Eight hours? Like, I get paid to wait.

SHAWNE MCKEOWN: M'hmm. You're gonna have to work overtime my friend.

RAY HARRIPAUL: Are you serious?

SHAWNE MCKEOWN: Yeah.

RAY HARRIPAUL: More than eight hours?

SHAWNE MCKEOWN: Sixteen hours. So that is according to Health Quality Ontario. They are a government task force. They released a report with that stat in it in November, 2018.

RAY HARRIPAUL: And in February, 2019 the government announced it's going to create a healthcare super agency to provide more integrated care and make the system easier to navigate.

SHAWNE MCKEOWN: Another way we could create efficiencies and possibly reduce wait times could be using new technologies. Um, robots. Say, automated pharmaceutical dispensing, 3D printed medical devices, artificial intelligence enabled systems. There are all kinds of things, don't you think?

RAY HARRIPAUL: I'm all for using technology to reduce wait times and get people the help they need faster but I'm about the jobs. So I'm asking this: at what cost?

SHAWNE MCKEOWN: We're gonna look at the future of Canadian health care and new opportunities for work. It's pretty exciting.

RAY HARRIPAUL: I'm pretty excited about this. Hopefully we don't have to wait too long. Welcome to Work Shift.

[music]

DR. CORY ROSS: There are going to be future jobs. So in other words, they're going to have to train students for jobs that don't even exist right now. But there's also a whole bunch of jobs that are being recombined based on what we see currently. There's gonna be medical roboticists which marries both the practice of medicine and engineering. That is someone who will actually help out with the actual insertion of robots in the hospital setting.

[music]

SHAWNE MCKEOWN: Medical robots. What do you think, Ray?

RAY HARRIPAUL: Sounds interesting. In fact, I'm actually now just getting used to my little Roomba.

SHAWNE MCKEOWN: Oh.

RAY HARRIPAUL: Little cute Roomba.  
(laughing)

[music]

RAY HARRIPAUL: Digital disruption.

SHAWNE MCKEOWN: The gig economy.

RAY HARRIPAUL: Artificial intelligence.

SHAWNE MCKEOWN: Robots.

RAY HARRIPAUL: There's a lot of talk about these things in the media and online but what do they mean for you?

SHAWNE MCKEOWN: I'm Shawne McKeown.

RAY HARRIPAUL: And I'm Ray Harripaul.

SHAWNE MCKEOWN: We're exploring the future of work and changes you can expect to see at your job.

RAY HARRIPAUL: We'll tell you how this massive digital shift could change your career and what you can do to adapt, evolve and thrive.

SHAWNE MCKEOWN: Today we're talking to Dr. Cory Ross about emerging health care technologies and trends and what that will mean for jobs in this sector.

RAY HARRIPAUL: Cory started out as an anatomy prof and has gone on to have an extensive research career, attracting more than 5,000,000 in research grants and publishing more than 50 papers in peer-reviewed journals.

SHAWNE MCKEOWN: He did his Masters of Business Administration in the U.K. and was a hospital administrator before moving into the education sector. Cory is a Fellow of the U.K.-based Royal Society for Public Health. In 2015, he was granted Member Laureate status by the

Bethune Medical Development Association of Canada. He's currently VP Academic at George Brown College.

DR. CORY ROSS: Well, healthcare is currently undergoing a phenomenal transformation. And actually it's two-fold. There are gonna be future jobs; so in other words we're gonna have to train students for jobs that don't even exist right now but there's also a whole bunch of jobs that are being recombined based on what we see currently. And so, I'll read a list of some of the things that are happening that makes it a very exciting time to enroll in health science courses and programs because there are going to be a lot of new types of jobs that are going to really help the healthcare system push itself in terms of its quality and in terms of delivering much better patient care and client-centered care. So some of them are a little obvious. There's gonna be medical roboticists which marries both the practice of medicine and engineering. There's gonna be tele-surgeons where you can actually perform surgery at a distant site; not being there but through almost like a telemedicine. There's now this big surge on big data and so bioinformaticians are going to be very, very important and what that data is gonna help shape how we actually look at how we deliver healthcare. Something that's new, a little bit controversial, there's cryo-preservation specialists.

SHAWNE MCKEOWN: Wow.

DR. CORY ROSS: So those people who believe that they would like to be frozen in time to be reinvigorated at a later time. So that's an interesting one. There's also going to be students and practitioners that are called custom implant organ designers where they can actually help on organ transplantation teams on picking the actual organs that will be needed. There is an end-of-life therapist to help not only-- you know, we have it for early childhood care but we don't have it for end-of-life. There is gonna be genetic counsellors because the whole issue of genetic counselling and mapping the chromosomes and understanding what the genetics say will be important for later on. Whether unlocking or actually blocking the release of expression of genes. There's gonna be health speciality professions; especially looking at the marriage between western medicine and alternative medicine. So the conventional versus alternative. Although, depending upon what part of the world you are, those terms can be flipped. There'll be health care navigators. Basically professionals who help you navigate through a very complicated system. And the last is a resurgence of a very ancient art that was really depicted many, many years ago maybe in the seventeenth century and that's medical scribes. And I'll talk a little bit later about the whole profession of being a medical scribe.

SHAWNE MCKEOWN: Sorry, what was number one again that you said?

DR. CORY ROSS: Number one was a medical roboticist.

SHAWNE MCKEOWN: Okay. Can you tell me about what that is?

DR. CORY ROSS: So that is someone who will actually help out with the actual insertion of robots in the hospital setting.

SHAWNE MCKEOWN: M'hmm.

DR. CORY ROSS: So, we see this often in Asia where you can actually go and have your blood draw done by a robot. A robot will come to your room.

SHAWNE MCKEOWN: M'hmm.

DR. CORY ROSS: You'll be able to basically swab up and place your arm into a receptacle and the robot will actually do your blood draw.

SHAWNE MCKEOWN: Right. And then would that one robot be used for that one function or would you-- would it be able to do multiple things?

DR. CORY ROSS: I've seen robots that are very uni-dimensional; one function.

SHAWNE MCKEOWN: M'hmm.

DR. CORY ROSS: I've seen others that have a mosaic of functions. So not only can this robot withdraw blood but it may be even able to administer the flu vaccine or may be able to remove stitches and sutures.

SHAWNE MCKEOWN: So, a few years down the line, we have robots that can potentially do these tasks at the bedside or at a pharmacy even? So, then what happens to the nurses who usually do those jobs now?

DR. CORY ROSS: So, it's interesting, throughout history when we talk about AI and artificial intelligence and robots, there has been a reduction in job function---

SHAWNE MCKEOWN: M'hmm.

DR. CORY ROSS: To actual professions, however those professions are now used more strategically for other things. So, a nurse can spend a lot more time cognitively with the client and not do the procedure.

SHAWNE MCKEOWN: So, for anyone who is listening who may hear about more robots being used in health care and more automation and instinctively worry that that might mean not the end of but less of the human touch aspect of healthcare, you're kind of saying the opposite here. You're saying actually it would free up nurses to spend more time in that face-to-face time with patients and---

DR. CORY ROSS: Absolutely. It's actually in a funny, round-about way, it's getting back to the nursing profession.

SHAWNE MCKEOWN: But the role of big data? Can you tell me more about that in healthcare?

DR. CORY ROSS: So, we see that every day today and we just don't realize what we're doing. But by placing our Fitbits on and by allowing a machine-type to understand your whereabouts, what you eat, how you sleep, all the issues--- all the areas that Fitbits take into account, there's a huge registry and repository of all that information. That information's important because essentially, every human being that is wearing that Fitbit, identity-secured is actually supplying information to big companies, big pharma, big analytic companies to then fashion what the next wave of medical devices will be. I could see one day where all of us will have a chip implanted and in the Nordic countries it's begun--

SHAWNE MCKEOWN: M'hmm.

DR. CORY ROSS: Where your health record you carry with you all the time 'cause it's chipped inside you.

SHAWNE MCKEOWN: Right.

DR. CORY ROSS: And so, this is what's important. This is what the bioinformaticians will be able to extract.

SHAWNE MCKEOWN: And do you see a huge, you know, in your opinion, see a huge kind of explosion in potential jobs in that area compared to like, what is it like now?

DR. CORY ROSS: Yeah, I do because we see it actually in business with an area called business analytics.

SHAWNE MCKEOWN: M'hmm.

DR. CORY ROSS: And that's really to shape the market place in terms of consumer demands and what consumers are looking for. It'd be the same thing in terms of health.

SHAWNE MCKEOWN: Right.

DR. CORY ROSS: And so, the individuals who are going to be dealing with the biostatistics will be helping sequester the data necessary for large companies to start producing devices and even hospital visit-like durations and waiting times based on prognostification of an ordeal of an illness.

SHAWNE MCKEOWN: Can you tell me more about jobs that may have to shift or change or may not exist in 50 years?

DR. CORY ROSS: So, if we take the experience of a medical doctor, we now see that the pharmacist is able to actually do a lot more than what they used to do in terms of dispensing pills or actually using their apothecaries to actually make the preparations. They're now injecting; they're now prescribing certain drugs. So, every professional along the line has had scope creep and something's happened. But all in all, what it is basically is there is no way with the infrastructure that we have and the human resource power that you could deliver a top rate service to everybody out there.

SHAWNE MCKEOWN: Right.

DR. CORY ROSS: Case in point, the flu season. I mean, when you go into the doctor's office and there's a waiting line of 150 people waiting for the vaccination or for the sequelae of having the flu, I mean you need other professionals to step up with a scope of practice so that you can lessen the burden on the medical system.

SHAWNE MCKEOWN: M'hmm. And what about in terms of people who may not be dealing with patients face-to-face? Do you see any of those position changing? I'm thinking like, from ranging from hospital cleaners to people who are building prosthetic pieces? What about those types of jobs? Or denturists?

DR. CORY ROSS: Yeah, absolutely. So, I'll give you a good example around the world what's happening. So, I do a lot of work in China and currently in China it's very, very interesting because when I left five years ago to visit China in terms of denturism, I believed what we had created here in Toronto was state-of-the-art. And what low and behold when I got to China, I walked into the Suzhou General Hospital, went to their department of stomatology which is their department of dentistry. And I visited there the way that they fabricate dentures. Well, we were fabricating dentures the old way. We were setting teeth and articulating the two plates, maxilla and mandibular plates. Whereas in China, individuals were sitting in a chair, they were hooked up digitally intra-orally and extra-orally. The information, the data was sent to another centre. The centre was connected to 3D printers and low and behold, three hours later the client was walking out with their dentures. So, the question is, so what happens to the dentist?

SHAWNE MCKEOWN: Well how long would it take here, comparatively?

DR. CORY ROSS: Here, from a student's point of view, we have the client come back at least four or five times over a three to four-month period---

SHAWNE MCKEOWN: Whoa.

DR. CORY ROSS: To set the dentures. But the question is, what happens to those denturists along the way?

SHAWNE MCKEOWN: Yeah.

DR. CORY ROSS: China still has the same amount of denturists but now what they're doing is focusing on the realignment of the primary denture. In other words, the dentures are already seated, however now a dentist-- denturist will actually come and work with the facial features and look at the pressure points and to reduce that. So, they're on the minor fine-tuning---

SHAWNE MCKEOWN: M'hmm.

DR. CORY ROSS: Not on the fabricating of the denture which is highly labour intensive.

SHAWNE MCKEOWN: And is that a-- sorry. How did you phrase that again? The realignment of the denture?

DR. CORY ROSS: Right.

SHAWNE MCKEOWN: Is that kind of still done in the old-school way like?

DR. CORY ROSS: Ours? Yes.

SHAWNE MCKEOWN: No, but even in China when you have someone go for a second visit?

DR. CORY ROSS: Yeah, yeah, except that it's, you know, it's much more precise because you have a radiographic digitized piece that you can study prior to seeing the client.

SHAWNE MCKEOWN: Right.

DR. CORY ROSS: And remember in China too, which is interesting, people are travelling vast miles and traversing cities to get to these centres to have their dentures done. They can't keep on doing that. So, they have to come, spend the day and leave. Scalability is everything. My wife I were very-- we were marvelled at this that we would go to the pharmacy. There would be 25 people wide.

SHAWNE MCKEOWN: M'hmm.

DR. CORY ROSS: Twenty-five people deep as the first cohort of people to the pharmacy and not anybody spent more than three minutes in line. You would submit your card from your doctor-- electronic card. You'd walk down an aisleway and you would see in the background how the pharmacy works. It almost looks like the perpendicular view of Amazon floor with all the boxes. We certainly can steal from them-- great ideas. I don't think we have such a huge need but quite frankly I wouldn't mind being able to get my 'script filled within five minutes.

SHAWNE MCKEOWN: No, no. I wouldn't either. And can you tell me was there anything in elder care that you saw there?



DR. CORY ROSS: Yeah. So elder care is a huge concern for mainland China and for actually the Pan-Asian world because modern day now is children are educated, they are leaving so the parents are left behind. In China in particular there was the one child rule so there's only the one child. They are building huge centres for elder care but they have an infrastructure problem and that is the human infrastructure. You either have a maid or you have a nurse. There's no personal support worker. And that's one of the places that George Brown feels that they can actually really help fill the void in China and actually begin to train in regional centres-- personal support workers get train-the-trainer so that a whole bunch of people can be served. I mean, in Canada, people say, "You wanna come visit my nursing care home? It's quite large." So, you would go and it's six floors high and there's maybe 200 residents and you go, "Wow. That's pretty big." In China there's centres of 15 buildings being built all 74 floors high with an underground arcade and promenade of medical services and medical tourism. I mean, so the numbers are huge.

SHAWNE MCKEOWN: Right now in Canada, what are some kind of cool new technologies and positions that have cropped up say just very recently that--

DR. CORY ROSS: Yeah. So, there's two in particular. There's one which involves tele-health, tele-surgery and that is being able to conduct surgery especially for our northern partners that don't have the luxury of urban centres and urban hospitals for doctors to actually perform surgeries through a robot. So, they'd be here in downtown Toronto. They'd be controlled through controllers but the surgery would be done up in northern Ontario.

SHAWNE MCKEOWN: Right.

DR. CORY ROSS: And so that's here already. Remember that-- so there's two jobs here.

SHAWNE MCKEOWN: Yeah.

DR. CORY ROSS: So, medicine, you know, think about this. So, medicine is being performed through tele-health and tele-surgery.

SHAWNE MCKEOWN: Yeah.

DR. CORY ROSS: However, you're going to need specialized humans to actually help fix the machines. And so that's a whole production of another kind of service. So, as I said before as---

SHAWNE MCKEOWN: So, technicians essentially.

DR. CORY ROSS: Yeah. As robots take over, somebody's gotta take care of the robots.

SHAWNE MCKEOWN: Yeah.

DR. CORY ROSS: Exactly. So, Newton's third law of thermodynamics, for every action there's a reaction and that's one of them. So, you know, we often say that people are sometimes often scared about the change but we often say-- we use this moniker that, you know, you have to respect the past but you have to embrace the future.

SHAWNE MCKEOWN: Right.

DR. CORY ROSS: And so, it doesn't mean that-- so given the case in point of the denturists, you're not throwing away that past. You're just retooling them to embrace the future.

SHAWNE MCKEOWN: And I think that addresses probably a big fear a lot of people have in a lot of industries. You know, the robots are gonna take over and we're gonna lose our jobs and, you know? And where in fact they actually could free people up to do more human work, you know?

DR. CORY ROSS: Right. And service a whole, much more swath of people.

SHAWNE MCKEOWN: M'hmm.

DR. CORY ROSS: So, you wouldn't have to wait three weeks for your repair person.

SHAWNE MCKEOWN: And this has nothing to do with robots, AI or automation but cryogenics.

DR. CORY ROSS: It's funny because---

SHAWNE MCKEOWN: Just gotta ask.

DR. CORY ROSS: No. Listen, if you watch the news lately you actually have a surgeon in Russia trying to do what's called a head transplant. I mean, nothing is sacred anymore. So basically, people are-- this whole movement of cryotherapy, cryogenics is big business. And in the States, I'm led to believe that there are centres in Los Angeles where people are preserving their bodies.

SHAWNE MCKEOWN: All right.

DR. CORY ROSS: So, to be reawoken at another time when cures come for certain things, we can start life again.

SHAWNE MCKEOWN: Let's just-- let's just riff on that one. Let's like, imagine that becomes a thing and then like, what are the-- what is a potential job that could come out of that? It could be like the reanimation therapist or something.

DR. CORY ROSS: It could. There's lots of, you know, there's lots of possibilities. You can extract a whole bunch of different pathways.

SHAWNE MCKEOWN: This is kind of a broad question but if you had words of advice or words of reassurance and I know what we talked about earlier kind of speaks to this but for someone who's working in the field, in the sector who might be concerned about the future--

DR. CORY ROSS: So, yeah. So, I say that's, you know, I often counsel students here at the college, I counsel my own children. I practice the same way. You're always in shape for retraining. You're always learning. And so jobs will come and go, professions will transform and morph but you're always on that continuous cycle of learning.

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SHAWNE MCKEOWN: It's time to take a look at the future 'want ads'.

RAY HARRIPAUL: We're going to ask our guest to give us an outline of a job that doesn't exist yet. According to the Institute of the Future, a non-profit think tank based in Palo Alto, California, 85 percent of jobs that will exist in 2030 have not been invented.

SHAWNE MCKEOWN: Okay, Cory. What have you got for us? What job do you think will be in demand in the future?

DR. CORY ROSS: The medical scribe.

RAY HARRIPAUL: What will a medical scribe do?

DR. CORY ROSS: Technical tasks such as entering medical information into an online database. Clerical tasks such as writing down medical information into a medical record system. Organizing tasks such as organizing patients' charts. But they must definitely be able to do it and have typical responsibilities that would include entering medical records into a portal such as the electronic health record, the EHR; charting the doctor and patient encounters such as documenting patients' medical concerns: primary, initial and secondary complaints. Writing letters such as referral letters for doctors; helping with e-prescribing such as electronically prescribing medicine and keeping track of medical testing times; making sure patients get their results in a timely matter; and make sure a small synopsis is done for the doctor with the medical information. So, it seems like it's a very, very-- it's a very crucial job to the proper functioning of an office.

SHAWNE MCKEOWN: What skills will you need for this job?

DR. CORY ROSS: What I would suggest is it can actually be anybody that has already some sort of medical information or medical programming behind them. But I also believe that students can come out of high school, definitely have biology and the lexicon of medical terminology and actually enter into a two-year diploma or advanced diploma filled with medical terminology,

nomenclature and the history and public health system and all the program that you need to educate yourself to be the doctor's right-hand person.

SHAWNE MCKEOWN: That's cool. And do they get to use a quill?

DR. CORY ROSS: Yeah. (laughing) Now, now it's iPads. But actually, we can actually-- they, they can actually probably win the Quill Award if they do a good job.  
(laughing)

[music]

SHAWNE MCKEOWN: That's a wrap on this episode of Work Shift. What did you think?

RAY HARRIPAUL: Want to share your thoughts on the future of work in healthcare or another industry? Have you been affected by technological shifts in your career? Tell us about it.

SHAWNE MCKEOWN: Email us at [workshift@georgebrown.ca](mailto:workshift@georgebrown.ca)

RAY HARRIPAUL: And be sure to tune into episode three when we talk about the future of the business and finance world.

SHAWNE MCKEOWN: This podcast is brought to you by the fine folks at George Brown College. We want to thank Dr. Cory Ross for sharing his thoughts with us today.

RAY HARRIPAUL: It's the end of your Work Shift. Until next time.

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