Sawbones 007: Amputation

Published August 2nd, 2013

Listen here on TheMcElroy.family

Clint: Sawbones is a show about medical history, and nothing the hosts say should be taken as medical advice or opinion. It's for fun. Can't you just have fun for an hour and not try to diagnose… Your mystery boil?

We think you've earned it. Just sit back, relax, and enjoy a moment of distraction from… That weird growth. You're worth it.

[theme music plays]

Justin: [sounding panicked] Hello everybody, welcome to Sawbones, a marital tour of, uh, misguided medicine. I'm Justin McElroy.

Sydnee: I'm Sydnee McElroy. Justin, I've been looking all over for you, what are you doing here?

Justin: [dramatically] Just leave me, Sydnee. Leave me!

Sydnee: No, you're just laying there on the grass and you're—you're holding your foot. Are you bleeding?!

Justin: Not yet. Listen, Syd, we've had a lot of good years together, but I got a hangnail, and uhh, I don't know… I don't know if I'm going to pull through, Syd.

Sydnee: It's okay. No. We're getting out of this together! I'm going to drag you back to the studio!

Justin: Okay. Drag me.

Sydnee: [straining] Here we go!

Justin: You're dragging me!

Sydnee: [straining] I'm dragging you.

Justin: This is like when a lady lifts a car off her baby. She summons great strength in times of need.

Sydnee: [straining] Okay.

Justin: [sighs] Okay.

Sydnee: [relaxing] Oh, thank God.

Justin: You know, I was probably overreacting. It's just a hangnail. I think that there's probably a…

Sydnee: No. I'm the doctor here, let me take a look at it. Ooh. Uh-oh. This isn't good.

Justin: It's just a hangnail, Syd. Don't be silly.

Sydnee: No, no. This could get infected. This could ulcerate. I don't know how fast you're going to heal.

Justin: It's just a hangnail, I won't need to heal, it just—

Sydnee: No. I think there's only one solution. I think we know what we've got to do.

Justin: Just clip it off and then I guess I just move on with my life?

Sydnee: You're right it's gotta come off. The whole foot's gotta come off.

Justin: Nah… What?

Sydnee: That's right, Justin. The foot's gotta come off.

Justin: I don't think… I'm not a medical doctor, uh… I don't think…

Sydnee: That's right. I am, so listen to me, darn it!

Justin: Okay, listen. I'm understandably a little freaked out right now. I need my foot for soccer and stuff.

Sydnee: It's too late. It's too late for all that.

Justin: Listen. Okay, okay, okay, okay. Listen. I'm going to do whatever you say, I trust you. But can you walk me through… just walk me through a little bit about what we're talking about to help calm me down. Like you did that first time I tried Nyquil and you told me about all the chemicals in it.

Sydnee: Okay. Alright. I'll explain to you what we're doing, but we don't have much time.

Justin: I'd say we have about a half hour.

Sydnee: That infection could set in and it could develop and you could lose that foot to gangrene in… I mean, it could be as soon as weeks.

Justin: We have a half hour at least, I would say.

Sydnee: Okay. Well, let me tell you about amputation, Justin.

Justin: Please. It's the last thing I want to think about right now, but anything to take my mind off the pain.

Sydnee: Do you know where the word comes from?

Justin: Obviously not.

Sydnee: It comes from the word "amputare" in Latin, which means "to cut away." Which comes from "ambi," which means "around," and "putare," which means "to prune."

Justin: Okay.

Sydnee: So I'm going to prune around your ankle a little bit.

Justin: [sarcastic] Just cut some of this excess foot off.

Sydnee: May hurt a bit. Don't worry about it. Interestingly enough, the word "amputare" in Latin would only be used in reference to punishment for a criminal.

Justin: Like stealing, you'd get your hand cut off, that kind of thing?

Sydnee: Precisely. So it would never be used for like, the surgical procedure. That came much later. Like the 17th century.

Justin: Wow. So not a lot of… Usually we're going back to ye olde ancient times with Sawbones. This is a little more recent?

Sydnee: Well… no. The concept of amputation… I'm giving you some history of the word "amputation." You like that kind of thing. You love words.

Justin: I do.

Sydnee: That is your trade.

No, the idea that maybe, for some medical reason, people were removing limbs actually probably dates back to the Neolithic times.

They have found remnants of bone and something that was like a saw and rocks, and said, "Ah, there were probably Neolithic humans performing amputations for some reason."

I don't know how they figured that out.

Justin: I don't know. Listen, we're not caveman doctors. We're regular doctors.

Sydnee: No. I am not an anthropologist. And you are not a doctor.

Justin: Fair enough. Duly noted.

Sydnee: It probably… or we do have evidence from it in the Vedas text, the Sanskrit text from India from 3500 to 1800 BC. There were definitely amputations then.

Queen Vishpala had a leg amputated in battle, and they made her an iron leg to replace it.

Justin: God, that's hardcore.

Sydnee: Isn't that hardcore?

Justin: Yeah, that's pretty—

Sydnee: It's an iron leg.

Justin: Yeah, that's really boss. That's just begging for like, a Robert Rodriguez movie.

Sydnee: [laughs] It's gotta be hea-vy!

Justin: It is.

Sydnee: But it was really in Greece, and that tends to be where a lot of our episodes land, right? In Greece. Where we start to see the idea of performing this procedure for a medical indication, knowing why we're doing it. Not just randomly or guessing as to what old texts may be referencing.

We start to see the process of amputation for reasons other than traumatic. Other than your leg got crushed by a rock, and we've gotta leave it behind.

Justin: Like what kind of stuff are we talking about?

Sydnee: Largely, infection. At the time, we didn't have antibiotics, of course. We didn't have any way to fight infection, other than your own immune system.

So, if you had a horrible ulcer or something, y'know, some kind of infection in your extremity, in your foot or your hand or your leg or your arm, then it would continue to spread and spread until you died. You became septic and died.

Justin: Aw, man. I don't want that.

Sydnee: No, nobody wants that. So that's when they began to come up with the idea that you could amputate a limb, you could intentionally remove it in order to prevent the infection from spreading.

Justin: Right, because I think that the idea of spreading is, in itself, kind of an advanced idea when you look at how we saw the human body back then, right? Because we didn't see it… correct me if I'm wrong, as you don't need prompting to, I'm sure, but…

Sydnee: [laughs] No, no, no. Don't worry about that.

Justin: We weren't seeing the body as systems in the way that we do today, right?

Sydnee: Absolutely. Well, we didn't know… We knew that infection spread. I need to clarify; we didn't know the word infection or what infection was. We knew that redness, and heat, and then, y'know, dying tissue tended to keep spreading, but we didn't know what caused it. And we certainly didn't know that there was a circulatory system that was spreading it. Or a lymphatic system, or anything else.

Justin: But we saw something spreading, so we knew we had to cut it off.

Sydnee: We knew at least that it seemed to be progressing in a linear fashion, and that eventually, it would make a person so sick that they would probably die.

And so, y'know… and that's kind of a simplistic solution. So that part seems to be bad, the rest of them seems to be okay, let's just remove that part.

Justin: Which still, I guess, has some grounding in reality, right?

Sydnee: Oh, yeah. There's still… I mean, hopefully we're more scientific about it now. But yes, there's still call for this. And I think it's a testament to the 5th century Greeks that they figured this out.

Justin: Where next?

Sydnee: Well, it's interesting, because as we date back to Celcus, who would've… he was, uh… he would have operated around Year Zero, essentially.

Justin: With my man Jesu.

Sydnee: Exactly, around the time Christ was born. He was describing amputations, writing about amputations, that he was performing. And he was actually one of the… He was the first one to recommend ligating a blood vessel. Do you know that that means, Justin?

Justin: [laughs] Absolutely not.

Sydnee: So when you cut a blood vessel, as you may imagine…

Justin: Blood comes out.

Sydnee: Blood comes out. Good job! Gold star!

Justin: Yeah, well, I listened to the bloodletting episode, so I'm kind of a miniature expert when it comes to making people bleed.

Sydnee: [laughs] That's true. That's true. So, he was the first one to advise tying off those blood vessels to stop them from bleeding.

Justin: That seems… You've mentioned that to me before in passing that that happens. That seems so intricate. Like, I don't even know how you do that.

Sydnee: It is very intricate. You use very small thread and dexterious… dexterous… [laughs]

Justin: [laughs] Dextrenious.

Sydnee: Dexterity.

Justin: You need good fingers.

Sydnee: You need good fingers, yeah.

Justin: To do that.

Sydnee: And you practice. I mean, it takes a lot of practice.

Justin: Yeah, med students actually have to—

Sydnee: Special knots.

Justin: [sarcastic] Med students actually have to open their arms for at least two other students to let them practice on their veins, I heard.

Sydnee: [sarcastic] Precisely. My arm has been cut off and sewn back on several times.

Justin: You know that that actually does happen in dental school? They practice giving shots to each other?

Sydnee: In their mouths?

Justin: Yeah. A friend of mine went to the dentist and he said that his dentist told him that she used to get, at minimum, two shots every day, for a while.

Sydnee: That sounds horrific.

Justin: She said it never gets any better, which is comforting.

Sydnee: Well, I would imagine. They used to practice taking blood from each other in medical school, but we don't do that much these days because physicians honestly, at least in the US, don't take blood very often.

Justin: Nurses do it?

Sydnee: We're not personally responsible for phlebotomy. No, some still do, but most don't.

So he was ligating blood vessels. This seems like not a big deal, but it's a huge deal because it stopped bleeding effectively. Now, we still had the problem with infection, so the process of amputation is pretty easy. It's probably as simplistic… Well, I bet even Justin could guess how it's done.

Justin: [meekly] Saw it off?

Sydnee: That's right Justin.

Justin: You just saw it off?

Sydnee: You saw it off. So, if you want to remove a leg, you very simply—

Justin: You put the saw on it, move the saw back and forth.

Sydnee: Uh-huh.

Justin: [whispers] Just wait for the screaming to stop.

Sydnee: You cut through the skin, you cut through the muscle and all the tissue beneath. You cut through the bone.

Justin: You try not to lose your nerve halfway through.

Sydnee: You tie off the blood vessels. You bandage it. Probably cover it in some vinegar at the time.

Justin: Oh, that's good. Good job, guys.

Sydnee: And pray to the gods you believe in that it does not get infected.

Justin: Which it will.

Sydnee: Which it almost certainly will.

Justin: Because you're in ye olden days, and everything got infected all the time.

Sydnee: By 100 AD, Archigenes and Heliodorus began to… they were two more Greeks, Romans…

Justin: Lend me your ears.

Sydnee: Greeks, Romans. [laughs] Who began to use the same procedure for other processes other than just infection, although we didn't know what it was at the time.

Also for ulcers that weren't healing on lower extremities, so deep wounds, ulcerative wounds. For tumors. Although, again, they didn't understand the concept of cancer, but they knew something was growing there that shouldn't and would eventually kill the patient, so they could remove a limb for that.

And then, other deformities. Congenital problems or traumatic problems that would cause someone to not be able to use the limb. They also developed the technique of circumferential compression, meaning that they would tie something—

Justin: Circumferential compression… Break that down for me.

Sydnee: So circumferential, going all the way around, and compression, applying pressure. So like a tourniquet kind of idea.

Justin: Dig.

Sydnee: So they would apply… And it wasn't a tourniquet yet, not yet. But they would apply pressure around the top, above the blood vessels, so that they wouldn't bleed as much.

And they continued to ligate vessels, which is a big deal. And Galen, who we have spoken of many times…

Justin: Galen. Always popping up.

Sydnee: Galen. He also advocated this procedure and wrote about the importance of using material that wouldn't rot or decompose easily to tie off the blood vessels, acknowledging that if the patient survived, the material would be there for a while.

Justin: [sarcastic] But, Galen later admitted, "That's a pretty big 'if,' they're probably not going to. You don't really need to worry about that too much."

Sydnee: And that's absolutely true. Most of these patients did not survive. This became even more true when… okay. something happened in the Middle Ages.

Justin: King Arthur.

Sydnee: Again, I have referred to the… [laughs] Well…

Justin: Majesty of Camelot.

Sydnee: [sarcastic] The majesty of Camelot occurred. There was—

Justin: [sarcastic] Merlin's magic.

Sydnee: [sarcastic] There was magic and singing. There were talking squirrels. There was much dancing, and then everyone forgot every smart thing they'd ever learned.

Justin: [laughs] Well, there was all the magic.

Sydnee: Everyone smelled bad. Everyone was making stinky poultices to put other stinky places.

Justin: [sarcastic] You know, Stinky Poultice was the name of my death metal band when I was in college. We didn't play out much.

Sydnee: Somehow, we completely forgot about that really great idea about ligating blood vessels.

Justin: That seemed pretty on-point. Especially for old dudes.

Sydnee: It was a really, really important idea, and we just stopped. And instead, we would use cautery, which means burning the vessels to stop the bleeding.

So a piece of heated metal. Just stick it on there after you've removed the limb, which was probably just as painful as it sounds.

Justin: Or dumping a pot of gold on their head to prove the supremacy of the Dothraki.

Sydnee: Is that some kind of cultural reference?

Justin: [laughs] Little Game of Thrones humor for everybody.

Sydnee: Oh. Okay. I was about to call it That Nerd Show, but then I realized that all of our listeners would turn on me.

Justin: Hundred percent.

Sydnee: [laughs] Never mind. Keep on keeping on, you—

Justin: That's actually all I had.

Sydnee: … You Game of Thrones… Justin.

Justin: [laughs] Game of Thrones Justin, that's what they call me at the office.

Sydnee: They also would use hot oil for this process.

Justin: I would think that between your choices… see, like, all things considered, molten metal doesn't sound that bad. I mean, obviously—

Sydnee: Oh, it doesn't?

Justin: I mean, obviously painful, but it seems like as far as cauterization and stuff that would be… I mean, hot oil would just bring you to a delicious golden brown. It would make you sumptuous, I don't think that it would get the job done, in terms of cauterization, right?

Sydnee: Well, I mean if you burn and clot the end of the vessel that… We still use cautery today. Let me clarify. In surgical procedures, cautery, the use of heat to stop bleeding, the use of electricity and heat, is still used. We burn blood vessels.

Justin: Right. But I'm just talking about the disparity between hot oil and hot metal. Which hot metal, you got kind of a Johnny Tremain vibe, I'm into it. But it seems like that would be a good solution, albeit a bad one.

Sydnee: [sarcastic] Well, why don't I try both on you later and we'll see which one hurts more?

Justin: Fair enough. I mean, I know they're both going to hurt. I'm just saying that hot metal, it seems like it would do the job… of cauterization.

Sydnee: Now, of course, the problem with all this is that we didn't have any anesthesia.

Justin: Oops.

Sydnee: So I will say this. In the 13th century, they did try to come up with something. They would soak sponges in opium and mandrake root, and then just hold it over the patient's face until they went to sleep.

Justin: [sarcastic] Great.

Sydnee: And then at the end, you could revive them with vinegar. Now, my guess is that they probably woke up when you…

Justin: Hey. Heyheyheyheyheyhey!

Sydnee: … took a saw to them.

Justin: And you wouldn't remember. You're half out of a nap, you wouldn't remember telling the guy he could saw your leg off.

Sydnee: Exactly. You wake up, you don't know what's going on. And a lot of this was done… I mean, again, we're talking about a lot of procedures that were probably done as a last resort.

They knew that patients were going to either die of the blood loss from the procedure, the shock of the procedure, or infection. So this was a really life-or-limb scenario.

Justin: Literally.

Sydnee: Now, in the 1400s, things got serious, because gunpowder was invented.

Justin: Ah, humanity. [sarcastic] Things were going so well with the magic and swords.

Sydnee: [laughs] And the mandrake root. The history of amputations somewhat parallels the history of warfare.

Because that was where we really learned how to do amputations and how to do them more effectively, was because of the invention of gunpowder, the use of guns, and the havoc that that has wreaked on the human body.

Justin: So by necessity, we were doing more. And I think that with anything, right, if you do it enough, some of these advances are bound to become… to emerge from that.

Sydnee: Absolutely. In a general sense, you have to give the military, throughout history, not just the United States military, credit for coming up with a lot of cutting-edge medical procedures and treatments and ways to manage conditions out of necessity.

Justin: Because they created them.

Sydnee: Well, I think that's a little presumptuous.

Justin: How do we patch up the people that we got shot?

Sydnee: [laughs] Well, that's true. In the 1500s, with more amputations being done, there began to be a kind of... codified procedures were described.

At first they thought, "Well, maybe it would be a good idea to apply a band of pressure above and below where you're cutting everything off and then…" But they were still doing weird things like putting egg white styptics on the wound.

Justin: [sarcastic] Why not?

Sydnee: To stop the bleeding.

Justin: [sarcastic] We're just guessing, after all. It's just cutting off a limb.

Sydnee: It was really—

Justin: [sarcastic] Why not put an omelet on there?

Sydnee: [sarcastic] Sure. We don't know.

Justin: [sarcastic] Sure, I don't know.

Sydnee: I don't know.

Justin: "Put an egg on it! We've got lots of those!"

Sydnee: [laughs] "We've got lots of chickens."

Justin: "Not the yolk! What, are you crazy? Just the white."

Sydnee: "Take a chicken, strap it to your plague bubo, and then take the egg and pour it on your leg after you amputate it."

Justin: "Not the whole egg. Just the—"

Sydnee: "Just the white."

Justin: "I got cholesterol issues; I can't eat the yolk."

Sydnee: I'm sure we'll have an episode that tells you what to do with the yolk.

Justin: Yeah, that'll be something else. Feed it to Rocky, so he can beat Apollo Creed.

Sydnee: Now, there was a French army surgeon in the mid-16th century who really… Ambroise Paré, who was really instrumental in coming up with how we're going to do amputations.

He brought back ligation.

Justin: Thank God.

Sydnee: He actually… Yes. So, again, we started tying off blood vessels, which we should have been doing all along. And he also started creating more prostheses. The idea of a prosthetic wasn't very popular prior to this, simply because most patients didn't survive.

So if somebody did, you would make one out of whatever you had. You know, wood or bronze or iron or whatever. But he started creating prosthetics, because people might actually survive the procedure.

And we got even better at it when, in 1616, we discovered how blood circulates.

Justin: Kind of miraculous, actually, that we had gotten this far without that knowledge.

Sydnee: It really is. The idea that we knew how to stop bleeding before we knew what direction blood was going and what carried blood where and how that whole circulatory system worked.

Justin: So what next?

Sydnee: So after that, the tourniquet was invented. There was—

Justin: Help me understand. You talked about how, in the Middle Ages, we were tying off above and below where you're going to make the cut, right?

Sydnee: Mm-hmm.

Justin: What differentiates that from a tourniquet?

Sydnee: What really differentiated it was the idea that this is… okay, this is something that we are actually applying above the site of the incision, so closer to the heart than the incision is going to be. And it is tight enough to actually stop blood flow.

Because there's a difference between just applying pressure to the area and actually applying a tourniquet. A tourniquet's idea is to stop blood flow. So

you don't just want to willy-nilly apply a tourniquet. If I put a tourniquet on your arm and don't do anything about it, eventually, that arm is going to die. It's not going to work anymore, because of lack of blood flow.

So applying a tourniquet and applying pressure are different concepts.

Justin: Okay.

Sydnee: With the surgeon, Petit, in 1718, he came up with the idea of a tourniquet, and then actually kind of revolutionized the incision-making process. So the way that they used to make incisions was what was called the "classic circular cut." It was one very fast… because your patient was awake…

Justin: Right. And unhappy.

Sydnee: And unhappy and in pain. So you moved as quickly as possible. You made one big circular cut through as quickly as possible, sawed through bone, and you were done.

He was the one to say, "You know what? We really need to cut the skin first, and then cut through the muscle so we can leave, perhaps, some extra skin to maybe cover things up at the end?"

Justin: Hm.

Sydnee: And eventually that gave way to a three-stage circular cut, where you would cut through the skin, and then you would cut through the muscles—

Justin: So you would cut through the skin and then peel back the skin a bit?

Sydnee: Mm-hmm. Peel it back a bit so that you could leave a little extra skin—

Justin: [shudders]

Sydnee: —and then actually cut the bone. Eventually, when we got to the point where we were making three-stage cuts, where we could saw the bone off a little bit higher up, so that the bone was not as long as the skin and the muscle around it.

Justin: Retroactive apologies to anybody trying to eat a ham sammie while they enjoy our program. I do apologize about that.

Sydnee: Yeah, if you have a weak stomach, well then, why are you listening to our show?

Justin: Sydnee actually can't… anytime we watch something gross on TV, we've been in situations before where we've both been eating, and she'll just be happily eating watching somebody get dismembered. She has a very high tolerance for that sort of thing.

Sydnee: It really—once you've spent a few months in anatomy lab, you really just don't… you know…

Justin: I'm just a big sack of bones and meat to you, aren't I?

Sydnee: Well, I mean… I wouldn't say that on the air.

Justin: [laughs] Fair enough.

Sydnee: It's interesting. During the Napoleonic Wars, there was a surgeon in Great Britain, Guthrie, and Larrey in France, who both made great advances with amputation. Again, through necessity. War equals more amputations.

And they both realized that it was better… at the time, prior to this, they thought it was better to wait a while before you cut a damaged or infected limb, until it was absolutely the last possible option. And they both realized that it was better to cut a little sooner. And they performed many amputations and wrote papers on them and actually began to improve the survival rate.

Still not great, but better than before. And they were both recognized for that. But it really wasn't until 1846 that things started getting good for patients who unfortunately had to undergo amputations.

Justin: Good, of course, being a relative term.

Sydnee: In 1846, the idea of anesthesia with ether was finally introduced.

Justin: You're welcome, humanity.

Sydnee: So in Massachusetts, the first surgery using ether was done. And obviously, this revolutionized the idea of amputations, because now, we could put a patient to sleep before we removed a limb.

Justin: It says here on your information that Lister developed the antiseptic technique. Is this Lister of Listerine fame?

Sydnee: This is Lister of Listerine fame.

Justin: Wow, that guy got around, huh?

Sydnee: [laughs] As he began to… And he did play on the ideas of, I have to mention when we talk about antiseptic techniques, there were predecessors who began to advocate this. Such as Semmelweis, the Father of Handwashing.

Justin: Sure. Hero of mine.

Sydnee: There is a Father of Handwashing. Semmelweis was the first one to say, "Hey, you notice how after we do autopsies, and then we go and deliver babies, the women that we delivered their babies get really sick? Maybe we should wash our hands in between."

Justin: Revolutionary.

Sydnee: He was drummed out of every medical society for it.

Justin: Wow, really?

Sydnee: Yeah. He was greatly criticized, because he insinuated that physicians could transfer disease. Which, of course they can.

Justin: Absolutely.

Sydnee: But that was not a popular idea at the time.

So Lister developed, in the late 1800s, antiseptic technique. And then, patients of all surgical persuasions began to really stand a chance, because we could put them to sleep so they could undergo the procedure. You didn't have to move quite as fast because your patient wasn't, you know, screaming in pain. We knew how to ligate blood vessels—

Justin: [sarcastic] Just sort of pleasantly, "Oh, what are you doing down there? Oh."

Sydnee: We knew how to ligate blood vessels, so your patient could--

Justin: By the way, are we talking about a local anesthetic or a…

Sydnee: Gas.

Justin: What's the other one?

Sydnee: General.

Justin: General.

Sydnee: General. So gas. Ether, and then chloroform. So you would just knock your patient out. And it was good that we had this, because what came soon… And I think when a lot of people want to hear about amputation, this is what they're referencing. What came soon after this was the Civil War.

Justin: Brother against brother.

Sydnee: And—

Justin: That's my thing I say about the Civil War.

Sydnee: It's estimated that there may have been 50,000 amputations performed in the Civil War.

Justin: That is the same size as the population of the town we live in, for perspective for people who live in the same town as us.

Sydnee: The problem was that a lot of gunshot wounds would result in just shattering limbs. And there was no way to piece anything back together at the time.

Inevitably, the limb would become infected, and the safest thing for the patient was to remove it, if you wanted to save their life. So that was where we kind of get this… I think the image a lot of people have of amputation, which is the battlefield amputation. It's the Civil War, there are bullets flying, men are screaming, there's a tent, and you've gotta—

Justin: That's always key.

Sydnee: And you have a guy whose leg has just been destroyed by gunfire, cannon fire, whatever, and you knock him out with some chloroform, and you move quickly.

You make a cut through the muscle and the skin, and then you saw right through the bones. And it's from the Civil War that we get the term… Sawbones.

Justin: Oh yeah!

Sydnee: Yeah. That's where that comes from.

Justin: Yeah.

Sydnee: You would ligate the blood vessels. You'd leave a little hole in the skin. You'd sew the skin back up over top, leave a little hole for all the fluid to drain out. Because inevitably, there's gonna be fluid in the tissue there.

And almost everybody got an infection and died.

Justin: Hey, sorry Civil War.

Sydnee: Sorry.

Justin: Hey, sorry.

Sydnee: They were doing the best they could.

Justin: Yeah, with the caveman level knowledge that they had of amputating things. "Put a hole there. Some stuff's going to come out, I guess."

Sydnee: There were some important advances in prostheses at the time as well, largely because of the need. Y'know, there was a need for prosthetics.

So prosthetics date back to probably 300 BC. They found a leg in Capri, Italy, that was probably… it was an iron and wood leg that was probably used as a prosthetic.

Justin: Can I have an iron and wood leg after you take my foot?

Sydnee: Well, I wouldn't know how to design it, because the leg was housed in England and was lost when Britain was bombed. So now we'll never know what that leg looks like.

Justin: God. You know, you think—

Sydnee: There might be pictures.

Justin: You think wars don't have a cost, and then you hear something like that that I'll never—

Sydnee: The Capri Leg is gone forever.

Justin: Then I'll never have my wooden and iron leg.

Sydnee: But in the 1500s, they started making prostheses with joints. And then, by the 1800s and then after the Civil War, they started making more functional ones that would seal to the stump and they began making more functional prosthetics.

And as time goes on, as we go to World War I and World War II, we become much better at performing amputations, and our skills at making prosthetics also greatly improve.

Justin: Now, Syd, sadly this is still performed today. Obviously, my hangnail is not going to merit, but what are some of the reasons that we would have for amputating today?

Sydnee: Today… And I wouldn't be so quick to say sadly, because again, it's still a lifesaving procedure. And this is something that, if you're, as a physician, considering recommending this course to a patient, you sit down and have a lot of conversations about the risks and the benefits either way.

And a lot of the time, you're doing this because it is the best option. Vascular disease, so if there's no more blood flow to the limb, and it's going to be a site of infection or non-healing wounds. Certainly disease that can lead to infection of the bone, osteomyelitis, and that could be a reason.

Trauma can be a reason if there's just nothing we can do. A crush injury. Cancer, that certainly can be lifesaving with some bone and musculoskeletal tumors. And then. congenital malformations. Usually the amputation has just occurred naturally in the womb, but that can correct and give people more function.

Justin: Our procedures have evolved too, I would imagine, right?

Sydnee: Absolutely. I mean, the basic idea is still pretty similar. The general thing that has improved is that we sever it… We cut through the skin and we cut through the muscle, and of course, we cut through the bone using an electric saw, but we re-form the muscle around the bone, so that prevents any kind of rubbing against the prostheses that will be there later.

And we also cut nerve endings higher and sew them into the surrounding tissue to try to limit the phantom limb pain that can result, and some of the neuromas, kind of little balls of nerve tissue that can form that can cause a lot of pain and problems post-op.

And obviously, we try to limit joint involvement, because a joint will always make it easier to use a prosthetic, and we use antiseptic techniques and anesthesia now, of course.

Justin: Much to the delight of everyone receiving.

Sydnee, we want to let our listeners go, but first, we have to talk about this guy, which is the guy that, I think, makes this entire topic worth talking about.

Sydnee: So, as I was putting together our topic, one of our listeners, Eric West, tweeted that we should talk about a fellow named Robert Liston. And he was absolutely right we should talk about Robert Liston.

So this was a surgeon, a Scottish surgeon, lived from 1794 to 1847. He's famous for… well, many things. But he was the first surgeon in Europe to use anesthesia, after it had already been used in the USA first.

Justin: What what!

Sydnee: That's right.

Justin: Brought to you courtesy of the red, white and blue, baby!

Sydnee: [laughs] But he was known as "the fastest knife in the West End."

Justin: [laughs]

Sydnee: So what he was known for, other than his, I think his personality, was for being able to amputate a leg in two and a half minutes.

Justin: [laughs]

Sydnee: Now, speed, of course, was important, because the patients weren't asleep.

Justin: Sure, yeah.

Sydnee: So getting through the procedure quickly had some value. But it's obviously not the only concern.

And Robert Liston could attest to that, as he, in one case… And he cited his four best cases. And he knew what he was saying when he said "best", so you know…

Justin: Okay. Alright.

Sydnee: … he had a sense of humor about himself. In one, he accidentally amputated the patient's testicles along with his leg.

Justin: Yikes!

Sydnee: But he did it in two and a half minutes.

Justin: Still… I mean, that's great timing. That's sort of like when Pizza Hut brings it in under 30 minutes, but aw, there's anchovies on it. It's the same sort of problem.

Sydnee: I don't think it's like, "Aw, there's anchovies on it." I think it's like instead of opening a box and finding a pizza with anchovies, you open the box and find a human head.

Justin: You open a box and find your testicles in there, huh?

Sydnee: Yeah, I was going to say. I mean, he cut his testicles off. And you have to know they couldn't sew those back on. Not then.

Justin: There was another case he cited as one of his best?

Sydnee: The other, this is his best case of all time. So during the procedure, he accidentally amputated his surgical assistant's fingers.

Justin: [laughs]

Sydnee: And as he was wildly slashing about, is all I can imagine, he also sliced through the coattails of a wealthy observer who had paid to come witness the fastest knife in the West End. And the observer, upon being attacked with a scalpel, actually dropped dead on the site.

Now, the patient on whom he was operating went on to die from gangrene, as did many patients at the time. And the surgical assistant whose fingers he sliced off also died of gangrene.

Justin: [laughs]

Sydnee: So this was probably the only surgery in history that had a 300% morality.

Justin: [laughs uproariously] There's a great quote here, if I may?

Sydnee: Please. Please.

Justin: "He was six-foot two and operated in a bottle green coat with Wellington boots. He sprung across the blood-stained boards upon his swooning, sweating, strapped-down patient like a duelist, calling 'Time me, gentlemen! Time me!', to students craning with pocket watches from the iron-railing galleries.

Everyone swore that the first flash of his knife was followed so swiftly by the rasp of saw on bone that sight and sound seemed simultaneous, and to free both hands, he would clasp the bloody knife between his teeth."

Sydnee: This is a surgeon!

Justin: An awesome surgeon. I know who I'm going as for Halloween.

Sydnee: So Robert Liston—

Justin: If you're listening.

Sydnee: Which you're not. We salute the effort.

Justin: Yeah. A for effort.

Sydnee: And we definitely will be reading more about you, sir.

Justin: Another person I want to give an A for effort is you, our dear listener, for sticking with us through another grisly episode of our medical history program. We sure hope you enjoyed it.

Sydnee: And don't worry, Justin's going to make it.

Justin: I'm gonna pull through.

Sydnee: He's just wimpy.

Justin: If you have a minute, if you could go to iTunes, search for Sawbones and leave us a review, gosh, that would just mean the world to us. When you take a moment to do that, it may take just a minute out of your day, but it really does help us out.

And of course, we want to thank some of the people who have already made the journey, made the long trek across their keyboard over to iTunes to review our program.

Sydnee: And I read them all, so don't think I don't.

Justin: So be nice. Some of this week's, motewolen, Tirond, paleoarchs, daddiosam, HeyMaryHi, Surprised by Kitten, Delwina, Cutetology, axion22, darren505, bubbles41. My favorite, MedHistorian, who is an actual medical historian.

Sydnee: Yeah, let me tell you, bud, when we checked out that we had a review by a med historian, I got pretty nervous. So I'm thrilled that you enjoy it.

Justin: So head on over to iTunes and we'll read your name on the air.

On Twitter, you can follow us @sawbones. You can go to maximumfun.org and listen to all the other great Max Fun shows, like *Jordan, Jesse, Go!*, *Judge John Hodgman*, *Stop Podcasting Yourself*…

Sydnee: *My Brother, My Brother, and Me*.

Justin: … *One Bad Mother*, and thank you to you, the listener.

Sydnee: Yeah, thanks so much for tuning in. It means a lot. We love your comments, we love your reviews. And keep on giving us suggestions of things you'd like to hear more about.

Justin: You can email us, sawbones@maximumfun.org, or just tweet @sawbones.

Thank you so much again for listening. Make sure to join us again next Friday for another episode of *Sawbones*. I'm Justin McElroy.

Sydnee: I'm Sydnee McElroy.

Justin: And as always, don't drill a hole in your head.

[theme music plays]

MaximumFun.org
Comedy and culture.
Artist owned.
Listener supported.