

Sawbones 115: Gunshot Wounds

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Intro [Clint McElroy]:

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 song plays]

Justin:

Hello, everybody. Welcome to Sawbones, a marital tour of misguided medicine. I am your co-host, Justin McElroy.

Sydnee:

And I'm Sydnee McElroy.

Justin:

Normally, we have, like, a fun fake—

Sydnee:

Like a bit.

Justin:

Like a bit.

Sydnee:

Like a whole little back and forth.

Justin:

Fun, goofy...

Sydnee:

Where we pretend...

Justin:

... fun bit.

Sydnee:

... like we're gonna talk... Like, we pretend like we're gonna talk about something else or, like, you just kind of happen to walk into our living room...

Justin:

Yeah.

Sydnee:

... to overhear us discussing something unrelated.

Justin:

Maybe I do, like, a fun accent. Like, I'd be like, "Zut, alors." Like, that kind of thing.

Sydnee:

That's Justin's favorite thing to say in an accent.

Justin:

Uh. "Zut alors!" You see I do that in a, we have books about that French giraffe Sophie. I do... Anyway, that doesn't matter. Um.

Sydnee:

No, because we're not gonna do a bit this time.

Justin:

No bits.

Sydnee:

We're not gonna pretend like you wandered into, like, our crazy conversation about how Justin thinks he's sick or, um, you know, us talking about Charlie or something like that.

Justin:

No. Uh. We're gonna talk about, uh, um, gunshot wounds on this episode. Uh, because it has become a pressing topic, I would say in the world.

Sydnee:

I think that, um, it, 'cause this is actually isn't something, I looked back, isn't something that anybody has asked me to specifically cover before.

Justin:

And why would they? [laughs]. And why would they?

Sydnee:

At least, you don't, you know. [laughs].

Justin:

This show's supposed to be fun.

Sydnee:

It is. Um, now, and I will say that you're gonna get your usual, uh, kind of goofy Sawbones stuff here.

Justin:

We'll still be...

Sydnee:

I'm not, there's no exception when we're talking about the treatment of wounds in general throughout history, I think you can imagine we've put some weird stuff on wounds. And I have all that gooey gory detail for you that you enjoy, but I think it's fair to say this is a little more of, um, more of a serious topic.

Justin:

You know, you have two options. You can either, uh, like, try to have a little bit of fun or just, like, scream in moral, mortal terror 24 hours a day. Uh, so it's...

Sydnee:

[laughs]

Justin:

... like, and then that's... so those are the two options. And we're trying to take option one, uh, because option... Nobody will buy ads on option two.

Sydnee:

[laughs].

Justin:

[laughs].

Sydnee:

Which is, which is the podcast Justin's going to do next, 'cause you know that's what we do, basically all day.

Justin:

Yeah.

Sydnee:

Justin comes up with new podcasts to do, but it's going to be him just screaming...

Justin:

Just screaming in panic.

Sydnee:

... in mortal terror. For, like, what? Are you doing, like, 30... Is that a 30 minute or is that a...

Justin:

Well, start with a tight 20.

Sydnee:

... more of a 60?

Justin:

Start with a tight 20...

Sydnee:

Okay, a tight 20 minute.

Justin:

... and go from there.

Sydnee:

Now [laughs], do you think any of our sponsors will be interested?

Justin:

Uh, you know what? I think I can get 'em for at least a couple months just based on the McElroy brand.

Sydnee:

[laughs].

Justin:

The beloved McElroy brand.

Sydnee:

Are, are you gonna, are you gonna get a brother in on this or is this a solo?

Justin:

Uh, a solo mish.

Sydnee:

A solo project.

Justin:

A solo mish.

Sydnee:

Okay, great. Awesome.

Justin:

Syd, uh, where does this, where does this start? Take me back.

Sydnee:

So let's...

Justin:

I know the Chinese invented, uh, gunpowder, right?

Sydnee:

That's absolutely right.

Justin:

For fireworks, right?

Sydnee:

Yes. Yeah.

Justin:

And they were, like, wait a minute? What if we put a bullet in here? Hachi machi, this is a good idea.

Sydnee:

Is it?

Justin:

"Ouch," said Daniel. "I don't agree. I think this is a bad idea."

Sydnee:

Don't do that.

Justin:

Don't do this, please.

Sydnee:

No, absolutely, you're right that, uh, the Chinese had been using, um, like, explosions. You know the use of, of gunpowder to propel rockets or fireworks, uh, for a long time before we started thinking about making weapons out of them. Um, and they were used, it was used first for, like, cannons and, like, big, large artillery-kind of guns, before we moved towards, like, handheld guns that were, like, hand cannons that were used in some parts of China and that kind of thing.

Justin:

Mm-hmm.

Sydnee:

But not, um, a very efficient, kind of, what we'd think of today as, like, a gun, so to speak...

Justin:

Okay. Yeah.

Sydnee:

... until later in the, in the 1200s, really. And we see a really good description of one that actually was written not in China, by Sir Roger Bacon in 1242, which is where you really describe, like, the kind of concept of using, like, a small explosion, like a small amount of, like, an explosive powder to propel a, a small object at someone very quickly.

Justin:

Mm-hmm.

Sydnee:

Which is, like, the most roundabout scientific way I can say of, like, shooting somebody.

Justin:

It sounds like the, uh, the explanation that Charlie's grandpa gives him in Charlie and the Chocolate Factory. 'Cause he says, "Remember how you asked me how a bullet comes out of a gun?"

Sydnee:

[laughs].

Justin:

... and then it's like, that's not it at all. Actually,

Sydnee:

That's not, that's not, no.

Justin:

... it doesn't...

Sydnee:

No, 'cause there's, like, there's—

Justin:

You don't put a chubby, a German boy into a tube full of chocolate. That's not how guns work, right?

Sydnee:

No, it doesn't work from, like, chocolate pressure.

Justin:

No, there's no chocolate pressure involved.

Sydnee:

No, I'm not gonna be talking a lot about the gun mechanics, but I, I think that's... That's not how they work.

Justin:

No.

Sydnee:

Um. I wish they involved chocolate, but probably like...

Justin:

They'd be a lot better, yeah.

Sydnee:

Um. Initially, these attempts to make guns were much more likely to cause injury to the person attempting to shoot the gun, uh, because, you know, it was like a... It was supposed to be a small, controlled explosion and that doesn't always go so well.

Justin:

Sure, right.

Sydnee:

... when you don't know exactly what you're doing. It wasn't until the 1400s in the War of the Roses that we start to see artillery really playing a major role in warfare. And, I'm gonna talk a lot about this in, like, a sequence of wars and battles. Um, and I, that should probably make sense to you, because that's when we have, like, large collections of data on gun injuries and gunshot wounds and, like, surgeons who are trying to treat it and constantly, um, changing and adapting because they have lots of patients, unfortunately. So I'm gonna be skipping war to war, but that's the history of guns. That's the history of GSWs. That's the history of gun shot wounds.

Justin:

Okay.

Sydnee:

Um. So guns became more portable at this point, so they can be carried into battle. So they became a lot more important for winning, at this point. Um. And so what follows guns becoming, uh, more widely used is, uh, the first mention of treating wounds from guns. You know, that's, that's why surgeons started talking about it, right?

Justin:

Right, 'cause they, yup, 'cause they had to.

Sydnee:

'Cause it happened. Um, at first, there's, uh, no specific treatment, uh, that anybody, they just kind of acknowledged... like, there are already these concepts that they would draw of the wounded man, which was like this figure that, uh, that would be common for surgeons of the day to have. And it was, like, a naked guy standing there with, like, arrows and spears, like, sticking out of various, [laughs], part of his body.

Justin:

Yeah.

Sydnee:

And then, like, little descriptions of what each of these wounds are.

Justin:

I bet that's a few album covers by now. Wouldn't you think?

Sydnee:

You would think, right?

Justin:

Probably.

Sydnee:

And, like, initially it didn't have, um, artillery wounds or bullet wounds in it, because there weren't. Um. And so we see that kind of join the picture in 1497 when you first see artillery wounds pop up on the wounded man.

Justin:

Mmm.

Sydnee:

A German surgeon added them. Um. And even then, we see, like, a distinct difference in the way that surgeons are approaching, uh, bullet wound or an artillery wound as opposed to, uh, like a knife wound or a spear wound or an arrow wound or whatever other wound.

Justin:

Well, yeah. I mean you would think there's a difference in velocity. There's burns to consider, I would imagine.

Sydnee:

Exactly. Now they didn't quite understand these things, obviously, at the time like why they...

Justin:

Not everybody has my medical acumen.

Sydnee:

No, [laughs]. Thank goodness that, you know, some of us have more... Uh, but at the time they just knew that bullet wounds were different. That, like,

a knife wound or an arrow wound was cutting, is what they would have described it. And then they thought it was pretty straight forward. If you get, like, shot with an arrow, it either kills you right away, or you're probably gonna heal all right on your own. [laughs].

Justin:

Yeah. Well, yes.

Sydnee:

It's either gonna cut something really important or it's not.

Justin:

[laughs]. Medicine!

Sydnee:

Artillery wounds were much more complicated, because what they found is that they can be lacerating, they can be cutting, but they can also be contusing, meaning they can cause bruising and damage to the surrounding tissues. Like, a contusion is a bruise. And they were also penetrating, so they go much deeper because of the velocity and everything than, than a lot of these, uh, than a lot like an arrow, or something necessarily would. Um. So they can sever important structures, damage organs, but they can also damage all the tissue around the path...

Justin:

Mm-hmm.

Sydnee:

Plus, they go, like I said, they go deeper. And as they do, they can carry, what was called at the time, poison, along.

Justin:

What was the real...

Sydnee:

It was infection.

Justin:

Okay.

Sydnee:

And they were worried about infection. But, um, they, but they know that almost every single time somebody would get wounded by a bullet or, or artillery, they would get, um, they would have pus come from it. Which was their way of saying that it was infected, although they didn't know that was what it meant.

Justin:

Mm-hmm.

Sydnee:

They would say, "Oh, anytime you're gonna see pus because it's poisonous."

Justin:

Was that because it was deeper or harder to treat or... ?

Sydnee:

As the, well as the bullet passed through our layers of, uh, like, clothes and skin and everything...

Justin:

Huh.

Sydnee:

... it just carried germs. I mean...

Justin:

You just, that's how dumb I am. I would just assume germs can be just like, knocked off 'cause it's going so fast.

Sydnee:

No.

Justin:

No.

Sydnee:

No, they don't.

Justin:

No.

Sydnee:

Well, and it carries them all deeper, plus you've gotta consider, um, the bullet wound itself is likely dirty.

Justin:

Mm-hmm.

Sydnee:

But then, like what we would do to it afterwards...

Justin:

Right. I'm assuming it's gnarly.

Sydnee:

... is a big part of the problem.

Justin:

Gnarly attempts at...

Sydnee:

So let's talk about what we were gonna do to these. And that's going to give you a good reason why the gun wound wasn't what they, again, were referring to as poisonous.

Justin:

Right.

Sydnee:

A poisonous... and it took a long time by the way for us to get rid of the idea that wounds were poisonous. Um, it was like, it was like, throughout the writings of hundreds of years that, uh, "Gun wounds, of course, were

poisonous." Well, no, they're not. They're infected. But, uh, so what you could do was take a hot seating. So like, like a metal, like a rod... Like a hot, like, branding iron-kind of looking thing, right?

Justin:

Yeah.

Sydnee:

And you would drive it in and out of the gun wound.

Justin:

Just until they died...

Sydnee:

[laughs].

Justin:

... and so they don't have to worry about it anymore.

Sydnee:

What you were trying to do was force the gun powder out, because the belief was that it was the gun powder that was still in the tissue that was poisonous that was causing all of the pus and odor and everything that was actually infected.

Justin:

It's obviously wrong, but I bet... I mean, wouldn't it help somewhat because of cauterization?

Sydnee:

Yes. I mean, yes, driving... Yes, you would. You'd cauterize the wound and maybe stop bleeding, um, but you're also, again, sticking something that, while part of it is hot, not all of it is. Part of it is just, like, cold and germ.

Justin:

Dirty.

Sydnee:

Dirty. [laughs]. Um. And you're damaging all the tissue around it.

Justin:

Sure. Right.

Sydnee:

Probably. Um. And you're doing it for an indeterminate time to force powder out, which isn't necessary, of course.

Justin:

Right.

Sydnee:

Uh. And then what followed that was just as bad. You would plug the wound with lint that was moistened with, like, bacon or ox grease.

Justin:

Just like, they, they sat around, and was like, "What's a worse thing we can do? Let's start there and build up." Like—

Sydnee:

[laughs].

Justin:

"We can jam, hey, we can jam it full of grease and dirt and lint." "Yeah, man. That seems pretty good. Let's start there."

Sydnee:

Well...

Justin:

"Let's go up."

Sydnee:

... and the great thing was, they had all kinds of alternatives. If you didn't want to do grease, you can try melted butter, you can do barley water. You can try, uh, water with earth worms mashed up in it.

Justin:

[laughs]. That's not even a thing.

Sydnee:

That was a very popular... Earthworms play a big role here. Um. The important thing about all of these difference substances that you're going to pour in your, [laughs], your gunshot wound...

Justin:

Mm-hmm.

Sydnee:

... is, uh, that it's boiling hot.

Justin:

Sure.

Sydnee:

That's the main thing you want to make sure.

Justin:

Super painful.

Sydnee:

Whatever it is, it's that it's boiling hot. Um. And then you're going to cover it with rose oil, camphor, and turpentine. Now if the bullet is still in there, 'cause this is for a wound that the bullet is not there anymore.

Justin:

Mm-hmm.

Sydnee:

'Cause you, you cannot leave the bullet in. That was the, uh, the understanding at this time. This kind of waxes and wanes throughout history, whether or not you can leave bullets in, which now we know, there are people who have, like, you can see on X-rays and stuff little bits of

shrapnel and stuff inside. So we don't always necessarily go in and dig every little teeny bit of everything out. Like, buckshot...

Justin:

You can't get an MRI, though.

Sydnee:

Yes. That is true. That is very true.

Justin:

You hesitated.

Sydnee:

Eh, MRIs are electric gear, because it depends on the kind of... Generally, yes. Generally speaking, you can't get an MRI.

Justin:

That's better. Let's just go with that.

Sydnee:

Yeah. It's— There's a lot more to do with metals and magnetism when it comes to MRIs, but generally speaking, you can't. Um. But at the time, you were definitely gonna try to get the bullet out. So if the wound was not open far enough for you just to kind of pick it out, you would either open it up further by cutting... and these were techniques that they actually already developed from arrows. So a lot of this, they would just be, like, in the book, like, "Refer to arrows here." [laughs].

Justin:

[laughs].

Sydnee:

And then they'll tell you how to take the bullet out.

Justin:

Hmm. That would be early in the books. "A. Arrows, arrows, okay."

Sydnee:

[laughs]. So you'd either cut the wound open further to dig the bullet out, or what you would do is just keep stuffing dry packing into the wound.

Justin:

Perfect.

Sydnee:

Because it is, as it absorbed, like, all the liquid, like, the blood and the stuff-

Justin:

Mm-hmm.

Sydnee:

... in there. It's gonna expand and, like, open the wound up further.

Justin:

Great.

Sydnee:

And then you can just kinda, get some, you can get some bullet forceps...

Justin:

Pull it out? Yeah.

Sydnee:

... and... Um, and that led to the invention of new forceps, bullets did.

Justin:

Well, that's finally, something good from guns.

Sydnee:

We had to have new forceps to grab the bullets.

Justin:

Great.

Sydnee:

Um. One thing I did read that it was important at the time that you wanted the patient to stand in the same position, uh, that he or she was in when they got shot while you were extracting the bullet. Uh. I don't know. So it was an easy, like, a straight. Like, So you were kind of in, like, a hunched over, or were you, like, springing up with your arms up in the air with like a, like a, "Aaah!" expression...

Justin:

"Aaah!"

Sydnee:

... on your face. Like, just do that. Hold still.

Justin:

Just wait.

Sydnee:

I'm gonna dig a bullet out of you and then pour some hot grease in it. Hold still.

Justin:

Just hang in there for me.

Sydnee:

Um. In 1552, a big advance was made by Alfonso Ferriro, who was a surgeon who, uh, started to use some ligature, like, tying off blood vessels to stop bleeding. Which is crazy because he wasn't always clear on the difference between arteries and veins.

Justin:

Cool.

Sydnee:

So how he figured, I mean it's... Without that knowledge of the circulatory system, it's amazing, but it did move the field forward somewhat. He also advocated that instead of, at the time he would sound for bullets.

Justin:

Ooh. What does that mean?

Sydnee:

Like try to use, like, a sounding, to, like...

Justin:

What is that... What are you talking about?

Sydnee:

Like you would, like, looking for-

Justin:

Like using a divination rod to find...

Sydnee:

I think so...

Justin:

... water?

Sydnee:

Like sounding for bullets. Yeah.

Justin:

Oh, my gosh.

Sydnee:

And he kind of advocated. He just kind of, like, dig around with your fingers.

Justin:

Sure, get in there.

Sydnee:

There's probably more, there's probably, like...

Justin:

Like, pretend you're in a haunted house and you're digging for the bowl of spaghetti and eyeballs.

Sydnee:

[laughs]. He actually created a tool for it that he called an alphonsinum... his name is Alfonso...

Justin:

Mm-hmm.

Sydnee:

... which is my favorite surgical tool.

Justin:

Yeah.

Sydnee:

I don't think we use an alphonsinum anymore to my knowledge.

Justin:

No.

Sydnee:

But the alphonsinum, uh, I finally found a picture of it, and it kind of reminded me of, like, a really fancy, like, claw machine.

Justin:

Mmm.

Sydnee:

Like, you would, like, kind of... It was like, three fingers on, like, a spring and you would, like, stick it in and then, like, clamp it around something and drag it back out.

Justin:

Great. Okay. Got it.

Sydnee:

Um. He also advised, like, warm oil and vinegar baths. He said some good stuff, like immobilize, if it's around a joint, immobilize the wound. Massage it. Do slow range of motion. So he had some good ideas. Um, but, but on the flip side, he also said that, um, at the time, and this would've been all throughout probably most of what we're going to talk about, you would also bleed the patient.

Justin:

Sure.

Sydnee:

So they've come in, they've had a bullet wound, they probably lost a lot of blood. Part of your treatment is definitely gonna be cutting them and bleeding them or putting some leeches on them and bleeding them at some point. He did advocate waiting three days before you do it, though. Like, let them level out first.

Justin:

That's good. And then get in there and get all that bad, bad bullet blood right out.

Sydnee:

[laughs]. Um. Now we've talked about Ambroise Paré before. Uh, famous famous French surgeon, and he definitely, I mean, he advanced the field of surgery in a lot of different ways. Um, but definitely for bullet wounds as well. Uh. He actually kind of did it accidentally. He was using hot oil in the wounds, as was the fashion, as we discussed. Um, but one night he ran out.

Justin:

Mmm.

Sydnee:

So he just kind of had to use what he had, so he started using, what was described as a digestive. Which, like, I thought of, like, the biscuit.

Justin:

Digestive biscuits? Yeah.

Sydnee:

Yeah. But it's not.

Justin:

Not that.

Sydnee:

No. It's a mixture of rose oil and egg yolk and turpentine.

Justin:

Mm-hmm.

Sydnee:

Um. And he used that in the wounds instead of the hot oil, and he found that the patients, that those patients did better. The ones with the rose oil, egg yolk and turpentine, did better than the oily ones. Uh, and so somehow this advanced the field. I think the main thing is he started to move us away from the idea that things were poison.

Justin:

And it's pretty impressive, though, that he actually did, like, scientific testing. Don't see a lot of that in this time period.

Sydnee:

No, that's true. He compared the two. He actually, like, laid awake all night worrying about them and dreaming that all the patients that he used the digestive on were gonna die. And then he came in the next morning and wrote that it was all different. Like, everybody with the digestive did better. So, like, pouring boiling oil on somebody who's got a gunshot wound was a bad idea.

Justin:

Yeesh.

Sydnee:

Uh, but he did figure out better ways to remove bullets. Um. Better ways to close wounds. What wounds you should leave open and let heal by

secondary intention because they were infected and, although we didn't know that, but he figured out some good stuff about tying up blood vessels. Really smart guy. Again though, all these really smart guys who do some good stuff, there's, like, these weird little facts?

Like, one thing about Paré is that his digestive ointment was based on a secret antidote that he obtained, a recipe that he obtained from an Italian surgeon in Turin. And he writes about this encounter where he traveled to find this, like, famed Italian surgeon who had this, like, amazing ointment that was perfect for any wound, but hopefully for gunshot wounds. And this is what he says he did.

He went to him, and the surgeon said, "Here's what I need you to do. Go out and find me two puppies, one pound of earthworms, two pounds of oil of the Lily, six ounces of Venetian turpentine, and one ounce of brandy."

Justin:

Like, that's just horse apples. That's just horse apples.

Sydnee:

And I'm assuming, like, a Holocaust cloak, too. [laughs].

Justin:

Yeah. All right. Yeah.

Sydnee:

Uh. So once he...

Justin:

That's a Princess Bride reference, by the way. Not a Holocaust reference, if you're not familiar.

Sydnee:

Oh. No, yeah.

Justin:

[laughs].

Sydnee:

No, that's from the Princess Bride.

Justin:

Yeah, you know...

Sydnee:

It's a cloak that you can set on fire. Yeah.

Justin:

It's not, like, a cape that Hitler wore. Don't even, don't even panic.

Sydnee:

[laughs]. No, just... Uh, okay. And also, if you didn't get that, stop listening to our podcast immediately, and please go read the Princess Bride. And then you can watch it, too.

Justin:

Yeah, just watch the movie of it.

Sydnee:

No! Read the book. Anyway, uh, so he went and he found all these ingredients. 'Ingredients.' Um, and he brought them back to the surgeon who, unfortunately, boiled the dogs in oil.

Justin:

Accidentally?

Sydnee:

Accidentally. Uh. He added the earthworms that he did take the trouble of killing beforehand by putting the pound of earthworms in white wine, because it was thought that it would kill them and also make them expel the earth, [laughs], that was in there.

Justin:

So just to be clear, he gave a humane death to the earthworms. Boiled the puppies alive in oil?

Sydnee:

Yeah.

Justin:

Cool dude. Cool dude, Paré.

Sydnee:

Yeah. Not our best example.

Justin:

Not our best hero.

Sydnee:

Well, it wasn't Paré, it was his hero, this Italian surgeon whose name is lost in the literature.

Justin:

So he didn't also follow this crazy concoction?

Sydnee:

His was not identical. No, not at all. Um.

Justin:

I bet if you're gonna fudge one thing, I know which one it's gonna be.

Sydnee:

He didn't, 'cause at this point once you've got, like, the puppy and earthworm and wine mix, you're gonna strain it through a towel, and then toss in some turpentine and brandy, which I assume at this point was just to drink. [laughs]. Like, just to deal with the whole...

Justin:

Right. It's like [crosstalk]...

Sydnee:

... thing. And then you got this ointment. His was similar, I guess, in the sense that it had turpentine in it, but, uh, he didn't do all that other stuff. Thank goodness.

Justin:

That's also not much brandy. It's, like, an eighth of a cup. Like, that's not a lot of brandy.

Sydnee:

Well, that's more for drinking to deal with, like, the reality of what you've just done.

Justin:

Uh. I wanna hear more about all this, Sydnee, but, um, we, uh, have to take a quick break. And so we're gonna do that, uh, right now. Is that okay?

Sydnee:

Sure.

Justin:

Let's go to the billing department.

Sydnee:

Let's go.

[theme music plays]

[ad break]

Sydnee:

So in 1718, a big improvement, um, in the treatment of gunshot wounds is when the, uh, German surgeon Heister comes up with the tourniquet which, how is that related to a gunshot wound? Well, up to this point, um, it's crazy 'cause I would try to find these old manuals on treatment for gunshot wounds.

Justin:

Mm-hmm.

Sydnee:

Like, these old, like, war surgery manuals, and I kept thinking I clicked on the wrong link because there would just be these huge like, these huge

descriptions of amputation, field amputation, and that's because that was largely what happened.

Justin:

Mm-hmm.

Sydnee:

Like, you got shot on the leg or the arm and we just cut the limb off 'cause otherwise you were gonna die. The tourniquet helps to save your life, um, and now you eventually do get amputated, but you don't have to do it in the field, necessarily.

Justin:

Yeah. And I think this is a misconception I think a lot of people, like, have about tourniquets. I know I certainly did before, like, before you, like, told me about them at some point. Like, I kind of always assumed they were like a... They're something you gotta take pretty seriously. You gotta be really sure it's tourniquet time, right?

Sydnee:

Exactly. You don't wanna just willy-nilly throw on a tourniquet because when you're using a tourniquet, you are saying whatever's happening is life threatening, um, to the person, and so I'm willing to risk losing this limb in order to save this person's life. It is literally only used in life or limb.

We actually, if you use a tourniquet in the field, one thing we advocate, like if you're out in a, at a sight somewhere outside the road or out in the wild. Somewhere where, like, you're not gonna be maybe in direct contact with the hospital just yet. If you put a tourniquet on a patient, you write a T on their forehead. It's a quick way of communicating to the people in the ER, wherever they end up, like, this patient has a tourniquet somewhere. Strip 'em down and look for it because the sooner they can get it off, the more likely they are to save the limb.

Justin:

Mmm.

Sydnee:

Um. That's a side note.

Justin:

Cool tattoo idea.

Sydnee:

[laughs].

Justin:

Not really.

Sydnee:

No, don't.

Justin:

It's actually a very bad tattoo idea.

Sydnee:

Please don't do that. Please don't do that. Um. Other improvements in the 1700s include, uh, understanding that bullet wounds also cause... and we kind of knew that they were different wounds... but, uh, that we start to understand they 'cause crush injury to the surrounding tissue, because of, like, the air compression.

Justin:

Mm-hmm.

Sydnee:

And then we, so we start to understand, like, head injuries and intercranial hemorrhage and stuff that results from bullet wounds. From, like, just the velocity and, like, the air pressure from the bullet moving. Not just the actual physical bullet itself. Um.

In the late 1700s, and, and like the War of 1812, we start to see, um, improvements just because, like, of improvements in our, uh, front line, like, surgery efforts. Like we see stretcher brigades to get, um, wounded men off the field faster so we can care for their bullet wounds quicker. We see, uh, surgeons move to the front line to, you know, take care of the damage quicker. Um.

And in the 1800s we get, uh, some better guidelines for, like, uh, when a bullet-wounded extremity is gonna be amputated, how you do it, you know. And, um, then Lister comes along and we get, like, antiseptic theory and so, then we're not doing it in such a, such a sloppy, um, dirty fashion, so to speak. You know, and so then that greatly improves, um, the mortality from the bullet wound.

Justin:

Mm-hmm.

Sydnee:

And that's, like I said, I'm kind of moving war by war, 'cause this is really where, where we learned about bullet wounds...

Justin:

Sure. Right.

Sydnee:

In War World I, uh, we, uh, at the, uh, start out by, um, irrigating the wounds daily with, like, a chlorinated solution. Which sounds like a good idea, right? It sounds good.

Justin:

Mm-hmm.

Sydnee:

You're cleaning it out, right? But the problem is that you're opening the wound daily in order to do so.

Justin:

Ah, right.

Sydnee:

And so, while you're, yes, the...

Justin:

The, instinctually that sounds good, right? Keep it fresh, air it out, that kind of thing.

Sydnee:

It was a move in the right direction, but at the same time, you don't want to continue to just, like, re-open a wound, um...

Justin:

Right.

Sydnee:

... and expose it to stuff.

Justin:

Natural healing can't take place.

Sydnee:

Right, and you're also exposing this wound to whatever is on the person's hands...

Justin:

Sure.

Sydnee:

... or the sheets, or the, you know. Whatever. So, uh, a surgeon, Winnett Orr, came up with a new method: the Orr method, that involved, uh, debriding the wound, uh, and then you pack it with a Vaseline gauze, and then you put a cast on it, and you leave the cast on... this is true... until the smell gets so bad you can't bear it. And then you take the cast and change it out, and change out the dressing.

Justin:

Oh, god. [laughs]. What a metric.

Sydnee:

Um. And in World War II, we actually get a lot better at handling, um, bullet wounds because we start doing a lot of research into... this is even, this is sad to say... we started doing a lot of research into which weapons will create the most damage to the other side.

Justin:

Right.

Sydnee:

And in researching how best to hurt somebody...

Justin:

'Cause that's always been my problem with guns.

Sydnee:

Right, is that they don't damage people enough.

Justin:

Yeah. They just don't hurt people enough.

Sydnee:

Um. So it was actually, it was filed under a branch of underwater ballistics, because, um, here's a fact for you. A bullet hitting a body, the body sort of reacts like liquid does when a missile is hitting and moving through it.

Justin:

Mmm.

Sydnee:

So, if you wanna think about that.

Justin:

Great.

Sydnee:

Um. And, and we start to learn that like there's the cutting of the tissue by the bullet, and stuff that we kind of already understood, but as we get a better understanding of physics and, like, ballistics, we know a little better, is that there're shockwaves that damage the surrounding tissue... This is crazy. So we know there's clearly, there's a cavity formed by the path of a bullet, right?

Justin:

Right.

Sydnee:

Like, there's the hole that it makes, and the tunnel that it travels through. There is actually a temporary cavity...

Justin:

What do you mean?

Sydnee:

... uh, from the shockwaves, stuff is spread out. And there is a temporary hole/cavity that is formed inside the body that is 27 times larger than the permanent cavity that remains.

Justin:

What?

Sydnee:

So there is, like, you can do these, like, still motion photographs of the bullet entering, and, like, what happens after that. I mean, they did this again with, like, water and liquids and stuff like that to try to figure out how it works. And, like, everything spreads out really far from the shockwaves, and then comes back together, but that helps us to understand all the bleeding that happens, because it's not just the path of the bullet where the bleeding is happening, it's all the damaged tissue around it.

Justin:

Right.

Sydnee:

And so we start learning that, like, all that damaged tissue, while it's bleeding, if we can go in and stop the bleeding, all that tissue is salvageable. So we can clean out the, like, that bad stuff, get the bullet out, clean the wound right away, and stop that bleeding, and all that tissue will actually, it'll be okay. So it kind of helped us figure out why everything was such a mess and what we could do to stop, um, losing so much tissue from a bullet wound.

Justin:

Okay.

Sydnee:

And, you know, stop bleeding. And then, of course, uh, in World War II, you know, in the '40s, we see antibiotics hit the scene. Penicillin comes around and this hugely reduces the rate of, like, chronic bone infections from bullet wounds and that kind of stuff. Um, by Vietnam, we were much better at figuring out how to reconstruct blood vessels, which made amputation no longer the main treatment for...

Justin:

Great.

Sydnee:

... a bullet wound. Um. And nowadays, uh, you know, I could go into... There's endless things that you can say about how good we are at stopping bleeding, at ligating, you know, blood vessels and reconstructing blood vessels, and cleaning out wounds, and keeping things clean, and the antibiotic, antiseptic technique. We're good at removing bullets and preventing infection and limb loss. We have surgery we can do now because we can put people to sleep and intubate them and support them until they get better.

And so, I, you know, we're really good at treating gunshot wounds, as long as they make it to our ER. We're really good at that now. We have lots of ways of doing it. Um, but I would propose the best treatment for a gunshot wound be to stop shooting each other. That would be my main idea.

Justin:

Well...

Sydnee:

I mean, I can tell a million ways, uh, to kind of, like, take care of yourself when you got, if you get the flu. You know, how to treat yourself and then, like, make yourself better quicker, and then that kind of thing. But what I would probably tell you is to get a flu vaccine. There is no gun shot wound vaccine that I can promote for you.

Um. If there is one, uh, I would say this, because if you've been listening to a lot of the talk about gun violence that's on TV right now, um, then you've

probably heard something about a lack of research we have into gun violence. Have you heard anything about this, Justin? Is this...

Justin:

Yeah.

Sydnee:

... something that you're familiar with?

Justin:

That its, uh, yes. I am. And not just because you've, uh, mentioned it to me in passing. The, the, uh, lobby groups have basically lobbied to stop looking into gun violence.

Sydnee:

So, that's exactly right. In the '80s and '90s, we were doing... and I'd like to think about things in a scientific way. So this is me approaching... There is a problem, um, in the U.S. with people dying as a result of guns, and so let's look at a scientific way to stop so many people from dying, uh, from gunshot wounds.

Um, in the '80s and '90s, we were doing a lot of research, and making a lot of progress to try to figure out if we were gonna pass laws to try to prevent gun deaths, what would they look like?

Justin:

Mm-hmm.

Sydnee:

What would actually work? 'Cause let's not just do it willy-nilly because we're angry or we're scared or we're sad. Let's do it, do things at work. And we found some upsetting facts. For instance, um, there's a study in the '90s that show that having a gun in your home increases the likelihood that you will die from a violent death.

Justin:

Mm-hmm.

Sydnee:

Uh, it's more likely to kill you, a family member, or be used in a suicide than it is to defend you from somebody. Uh, but lobby groups, the NRA, in particular, did not like the results of this research, uh, so they started, um, pushing Congress to ban any kind of research... the, the wording is that "any research that might advocate gun control," um, and they actually defunded the CDC to the exact tune of the amount of money that they had spent on, uh, firearm injury research the previous year.

Justin:

Mm-hmm.

Sydnee:

And all other government organizations have met a similar fate, so nobody's doing this research right now, um, compounded with the fact that the assault weapons ban ended in 2004, and other little laws. Like, for instance, in some states, do you know that I as a doctor could not ask you, for instance, as Charlie's dad. I couldn't say, "Hey, uh, Mr. McElroy, do you have a gun in your home?"

Justin:

Mm-hmm.

Sydnee:

To talk about the importance of discussing gun safety and that kind of thing with your child. I would not be allowed to ask you that question because it would be a violation of your privacy. Now, I consider that part of my job as a doctor to kids. 'Cause I do take care of kids.

Justin:

Yeah.

Sydnee:

But there are some states where I would not be allowed to ask you that question. Um. And what I would say is that if you wanna know, if you're feeling helpless and you're feeling scared, and you wanna know something we could do, that would be the thing to push for. Instead of, let's just pushing for, um, stricter gun laws... that probably is the answer, but which

gun laws? Somebody needs to write 'em, somebody needs to word 'em... I would say that we need to just look at this scientifically.

Justin:

Right. We're not, I mean we're not advocating anything other than let's get some more information. It's a science podcast, right?

Sydnee:

Yes. It is a science podcast. Um. But I, my job... Uh, one of my jobs as a physician is to put injured people back together.

Justin:

Mm-hmm.

Sydnee:

And I would like to see a lot fewer injured people, personally. Um. And I think that there is an impetus on us as humans to figure out why so many people are getting shot in the U.S. and do something to stop it.

Justin:

All I'd add, because you spoke about it very eloquently. All I'd add is that I don't, I'm not in a position to tell anybody how we can rewrite gun laws in this country to make it safer to live and raise kids and stuff. I'm not that smart. But I do know that there is a very powerful group that has worked really hard to stop people from even talking about it.

And when you get to that point, even if you do think people should be allowed to own guns, if a group is trying really hard to keep people quiet and to keep people from asking questions, that's gotta raise your, uh... You know, I mean that's gonna set off alarm bells for you, no matter what you believe. At least, that's what I think.

If you're an honest person, um, then you should want there to be light shown on stuff. And the only reason we have made advancements like we have in medicine is because we've shone a light on this stuff. And if you think that, like, an issue this serious couldn't benefit from that. If you think that, um, uh, it's worth supporting a group that's trying to keep from us doing that, then I really don't know what to tell you. That's where I'm at.

Sydnee:

So that was our, that was our really heavy, serious...

Justin:

Happy holidays, happy holidays!

Sydnee:

... [laughs] Christmas podcast.

Justin:

Uh, yeah. So anyway, um...

Sydnee:

Sorry, I'm sorry Justin, sometimes I can't keep my mouth shut.

Justin:

Well...

Sydnee:

I just can't...

Justin:

Well, the little woman someday...

Sydnee:

I can't help myself.

Justin:

... someday you'll learn your place, et cetera, et cetera, the kitchen, et cetera, et cetera.

Sydnee:

Just kidding.

Justin:

I'll learn to defer to you, your man, your protector, your guardian. Uh. [laughs]. Anyway, this has been our show. Um. Thanks to Taxpayers who lets us use their song "Medicine" as the intro and outro of our program.

Thank you to Maximum Fun Network for, uh, letting us be a part of their, uh, their, their family of podcasts. Uh, you'll find a lot of great shows at MaximumFun.org.

Uh, listen, we are doing a, uh, my other podcast, My Brother, My Brother, and Me, we do a kind of a, uh, an annual charity drive to help out people here in the mountain state, in West Virginia where Sydnee and I live and where, uh, all of us, uh, hail from. Uh, we're trying to get basically get some stuff for people who don't have a lot this holiday season.

And, uh, if that's something that you'd like to be involved with, if you can kick in a couple bucks, or what have you. Um, you can get all the information on that, uh, on the My Brother, My Brother, and Me Facebook group. Uh, we're gonna actually post it on the Sawbones group, if we haven't already. You can also go the MBMBAM.tumblr.com and, uh, find out how to help there. We'd sure appreciate it.

Uh, also we're doing a show, um, with My Brother, My Brother, and Me on December 21st, 8 PM here in Huntington. Um, the tickets are, like, \$20 I think. And if you want to get tickets to that, that's gonna be a lot of fun, you can go to Candlenights.net, and, uh, and get the tickets for that. Or Candlenights.org if you wanna treat it like a charitable organization. That option is open to you as well.

Anyway, uh, that's gonna...

Sydnee:

And I really would, I would say, Justin, just to back up your point. I really would check out, as Justin said, um, the Empty Stockings group. The boys have, you know, helped to fill a lot of people's needs in this area at this time of year. Um, because you're working with local organizations, so, like, the stuff that you're donating, it's going... I mean, you are answering people's, like, direct needs. It's going right to people. You're really helping, like, on a one-on-one...

Justin:

Yeah.

Sydnee:

... level. It's a really cool thing that you don't always get an opportunity to do.

Justin:

Uh. It's fantastic. So go take part in that. And, uh, Syd, that's gonna do it for us, uh, until next Wednesday. My name is Justin McElroy.

Sydnee:

I'm Sydnee McElroy.

Justin:

As always, don't drill a hole in your head.

[theme song plays]

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