Sawbones 211: Wound Care

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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 music plays]

Justin: Hello everybody and welcome to Sawbones: A Marital Tour of Misguided Medicine. I'm your cohost Justin McElroy.

Sydnee: And I'm Sydnee McElroy. Well Justin I, I was trying to prepare for this show this week, and I found a way to prepare for both this show and my day job all at once, and I was very excited.

Justin: How did you swing that, Syd?

Sydnee: It is so rare that that you think that two would overlap a lot since they're both medically oriented but telling patients about how we used to bleed people and then actually practicing medicine actually don't uh—

Justin: Two very different ideas.

Sydnee: Don't coincide very often.

Justin: Um so what, how did you, how did you find this overlap?

Sydnee: Well, uh I'm gonna do a, I'm gonna do a grand rounds— do you know what a grand rounds is?

Justin: I mean I do but why don't you explain it for everybody out there.

Sydnee: I guess that's worth explaining. A grand rounds as opposed to making rounds, when a doctor says they're making rounds and many people might already know this but just in case you don't, that usually means we're walking around and physically seeing patients in a hospital or then following that up by sitting at a table and talking about them.

Justin: Mm—hm.

Sydnee: Those are rounds, but grand rounds—

Justin: Mmm.

Sydnee: Grand rounds, is when we all sit in a room together and teach each other something. So it use to actually involve a patient back in, back in the day you would actually bring a patient into the room and tell all of the residents or students about them and you know go over their case in front of everybody and hopefully like get some good ideas about what to do next.

Justin: And the patient will be present or no?

Sydnee: Yes.

Justin: Okay.

Sydnee: The patient would be present.

Justin: Wild.

Sydnee: Yeah.

Justin: That's an uncomfortable day I feel like.

Sydnee: Nowadays that's rarely done. Although there are times where patients are invited in to share their stories and such, it's very different. It's a very different context, but most of the time it's about a topic or a case that we can all learn from or something like that. And so, it's like an educational opportunity. So I'm doing a grand rounds and I thought, you know, why not do something I, I think I'm getting pretty good at, which is medical history, and we don't learn a lot about that in med school, so I was gonna do the history of wound care and I thought, "You know what? We should do that as a show."

Justin: But that said, if, if somebody was there at the grand rounds?

Sydnee: Right. If you are— depending on when exactly you put this show up, if you have or are planning Family Medicine Grand Rounds tomorrow in dining room six off the cafeteria [laughs] you probably don't wanna listen yet.

Justin: You're gonna be, be a repeat.

Sydnee: It's gonna be a repeat. It's gonna— I know that a lot of our listeners will be there at grand rounds.

Justin: So sorry in advance.

Sydnee: You just sign the sheet in the cafeteria, and you get free food.

Justin: Nice. Whoa, are we talking schlotskies or pizza or?

Sydnee: No, I mean it's hospital cafeteria food.

Justin: But still.

Sydnee: But as much as you want.

Justin: Woo. They have good bacon.

Sydnee: They do um not at lunch.

Justin: For a hospital.

Sydnee: Yeah [laughs] for a hospital, they're very great at bacon. But let's talk about wound care.

Justin: Okay.

Sydnee: Uh so thank you to all the people who recommend this topic, Cara and Bria and Allison and Charles and Vanessa and Amanda, Glen, Jennifer, Lindsey, Shauna, Shannon, and Celia. A lot of people, and, and a lot of people recommend this because uh one there's a lot to say about wound care through the ages as long as humans have been—

Justin: Getting wounds.

Sydnee: [simultaneously] Wounds. Exactly, which is since there have been humans essentially um, but we also do a lot of gross stuff.

Justin: Great.

Sydnee: And people love that I found. So, what's interesting is that some of the principles of wound care that still exist today actually have persisted through the ages.

Justin: Really?

Sydnee: If you— there is clay tablet from 2200 BCE with a description of what they call the "Three healing gestures of wound care", and those are wash the wound, make the plaster, and bandage the wound.

Justin: Okay, you got it.

Sydnee: There you go.

Justin: Make the plaster, I'm not sure about but—

Sydnee: You know what's interesting? So, the term plaster.

Justin: I know that they used as bandage in the UK.

Sydnee: Right, so when you think— what we think of uh like here, stateside, what we call a band aid generally, which is a brand name I guess.

Justin: Sure.

Sydnee: But we call everything like that a band aid, uh that, that is a plaster. Of my understanding in the UK, but a plaster as I'm referencing it historically obviously they didn't have from the start adhesive bandages, so plaster was some sort of dressing for a wound. Throughout history was usually made of like clay or mud and then it may have had some sort of healing herbs sort of mixed with it.

Justin: Okay, so like getting it dirty [laughs] basically.

Sydnee: You get the wound really dirty with this.

Justin: Get it dirty. So, the three good things are wash the wound, get it dirty, and then bandage it.

Sydnee: And then wrap it up [laughs].

Justin: Perfect.

Sydnee: No, but you would, you would put the plaster on there to try to absorb moisture out of the wound.

Justin: Mm—hm.

Sydnee: There was a thought that if you tried to because if it had like drainage and stuff like pus coming out of it, just absorb all that in the clay or mud or whatever, and then wrap it in a bandage to keep it dry, and then sometimes you would add oil to the plaster because then it wouldn't stick to the wound, which was a smart idea.

Justin: Yeah.

Sydnee: Because you know that's you ever had the edge of the band aid stick to like the actual part of the cut? That's no fun.

Justin: Ugh. Yeah.

Sydnee: Yeah.

Justin: That's grody.

Sydnee: Exactly. So, uh what's interesting is if you look back to like wound care one of the primary ingredients used by the ancient Sumerians was beer.

Justin: Oh nice.

Sydnee: For wounds. Yes. And I didn't know this. They actually were big time brewers. They brewed like nineteen different kinds of beer.

Justin: Brewmerians.

Sydnee: That's, that's good Justin.

Justin: Thanks Syd.

Sydnee: Have you been talking to my dad?

Justin: [snorts] No.

Sydnee: Um but they would uh they would apply beer to directly to wounds or added to wound dressing uh—

Justin: They take it out of the bottle first I'm assuming. Right?

Sydnee: Yes.

Justin: They wouldn’t just use it as a cold compress.

Sydnee: I don't think it was bottled beer.

Justin: That's true.

Sydnee: It's gonna be my guess.

Justin: That's a good point.

Sydnee: Imagine like giant casks or something.

Justin: Yeah.

Sydnee: Um but they would add something like one recipe involved turpentine and daisy and some flour and some milk and some beer and you mix it all together in a small copper pan and you spread it on the skin and then you bandage it and, I don't— it sounds like also some weird holiday drink that involves beer too.

Justin: Yeah. Yeah. It's like a low—grade eggnog.

Sydnee: Yeah. Uh but I just thought it was fascinating that they were expert brewers apparently.

Justin: Yeah.

Sydnee: Beer is ancient and magical Justin.

Justin: You're right Sydnee.

Sydnee: I miss it very much.

Justin: I, I know you do. You make me very aware of that every single day of our lives.

Sydnee: Just throwing that in there. Uh, the Egyptians were the first to introduce the idea of honey to wound healing and we've done a whole episode on honey, so I won't, I won't belabor this point, but honey is actually helpful in some cases in wound healing.

Justin: Some.

Sydnee: Some, right. And have known that for obviously a very long time.

Justin: Um we've been using it for a very long time. Know is a very strong word but I don't think we knew much at this point.

Sydnee: We randomly guessed it and it turned out to be right.

Justin: Thank you. Thank you.

Sydnee: For a very long time. So, it was a primary component of a lot of their wound dressing recipes along with grease and lint, and so when I say that—

Justin: [laughs] You, the whole doofuses [wheezing] just two steps forward, eight—hundred steps backwards you guys.

Sydnee: Now, now hold on. Let me break it down for you.

Justin: Like pizza we found on the ground. Toe jam.

Sydnee: So, grease, lint, and honey was like a basic wound dressing, and the lint when they say the word lint, when they use the word lint, they probably mean some kind of like fibrous material from vegetables.

Justin: Okay. Okay. Okay.

Sydnee: Okay.

Justin: Like smut.

Sydnee: That's different. Right?

Justin: Silt?

Sydnee: Corn silk. Is that what you're thinking of?

Justin: Corn silk. Not smut no. Smut's like the—

Sydnee: That's different.

Justin: The rot.

Sydnee: Yeah.

Justin: Like silk. Yeah. Corn silk.

Sydnee: Yeah.

Justin: Basically.

Sydnee: Something like that. Something fibrous. And the idea was that it would absorb drainage from the wound to try to keep it dry again. The grease would have been some sort of animal fat. So, the idea was like to create a barrier on top of the wound.

Justin: Okay.

Sydnee: To protect it from stuff.

Justin: Okay.

Sydnee: Right?

Justin: Okay.

Sydnee: So, you take some grease as a barrier, you put some honey on there to heal it. You put some grease on there as a barrier and some lint to keep it dry. It doesn't sound as wild when you break it down that way.

Justin: You're right, Sydnee. I'm sorry ancient, ancient folks.

Sydnee: Um and as we've talk about with honey before, it, interestingly the use of honey arose in different cultures independently. So, like—

Justin: So maybe we did observe something. I don't know. I don't wanna—

Sydnee: Ancient Indians were also using—

Justin: I don't wanna detract.

Sydnee: Yeah. Were also using honey but uh much of why the Egyptians were probably good at wound dressing is because they were so good at mummies.

Justin: So good at mummies.

Sydnee: They're so good at mummies.

Justin: "Hey. What's up? My name's Derek. I'm an ancient Egyptian and I'm good at mummies."

Sydnee: [laughs] Uh the Egyptians also made the first adhesive bandage.

Justin: Oh yeah?

Sydnee: Yeah.

Justin: Congratulations [crosstalk]

Sydnee: Yeah, self—sticking bandage. I don't think they called it band aid. I'm fairly certain band aid does not date back to the ancient Egyptians.

Justin: That's very good.

Sydnee: [laughs] Uh they also—

Justin: "Trademark that. What did you say? Band—Aid. Very good!"

Sydnee: "Because it provides aid."

Justin: "It provides aid and it's a band. Very good."

Sydnee: [laughs] Was that how Egyptians sound?

Justin: Yeah. I don't think so.

Sydnee: The ancient ones.

Justin: They, they probably didn't even speak English.

Sydnee: You know what? I bet they didn't. Um there's a lot of movies that probably need to know that.

Justin: Yeah, because they, yeah like Prince of Egypt.

Sydnee: Yes.

Justin: The Ten Commandments.

Sydnee: Or like the common default if we're not sure what language we should have the characters speak, we'll have them sort of speak very proper English.

Justin: Yeah, or trans—Atlantic.

Sydnee: Yeah, it's not, it's not a British accent or an American accent, it's, right, it's just that sort of—

Justin: Like it's basically the accent for fancy.

Sydnee: Yeah. That's what I mean. It's like a very fancy English.

Justin: Yeah.

Sydnee: But it's no country. It's no specific area, and it's the wrong language so never mind. Uh but most uh anyways—

Justin: That's a pretty good diversion. Of your diversions this is up there in the top ten I think.

Sydnee: Thanks. Hey, I'll use it tomorrow in grand rounds.

Justin: Perfect. Yeah. Well no, you can mark that one off as like "Okay that's a dud. I'm not gonna do the ancient Egyptians accent stuff." Of course, I won't be there for you to get around so. I begged and pleaded for Sydnee to let me come because they wanted her to do a sort of medical history grand rounds, and I said, "Well that's not gonna be the same without Hoops." She was like, "I think it will be fine."

Sydnee: I actually have to teach them.

Justin: Go on.

Sydnee: I know, I did, too many distractions sometimes.

Justin: Fart joke.

Sydnee: [laughs]

Justin: Is what you mean. You could say the word, Sydnee.

Sydnee: The uh the Egyptians also believed that the color green was healing and was the color of life so a lot of wounds would be painted green.

Justin: Ah. Mm. Good.

Sydnee: I read this note, as I was reading about like wound healing techniques throughout history and I thought, okay well that's obviously off

base and then the author tried to kind of make a case for like now what's interesting is that they may have used a copper based paint and copper in petri dishes is somewhat inhibitory to bacterial growth and so you could make the argument, and I was like, "Nah. That's a stretch. It was the color green."

Justin: It might be enough for what I'm gonna call a anecdotal justification. Right?

Sydnee: Right.

Justin: It might be like, I don't know, it seemed to have worked. Right? Like it may be enough for it to have helped some people like—

Sydnee: Maybe, but then again as we've talked about before on the show, just because something works in a lab doesn't mean it works in a human body so—

Justin: Right so we don't have trials.

Sydnee: Copper inhibiting bacterial growth in a lab doesn't necessarily, yeah. Um the uh and if you go through a lot of the ancient um Egyptian like the Smith papyrus, the Ebers papyrus, the Berlin papyrus, they all kind of have this common idea that the presence of pus in a wound is actually a good thing.

Justin: It— doesn't that— technically incorrect. Right? I mean you should— you want it out. Right?

Sydnee: Well, I mean if you're talking about like an abscess, once you see pus that is better because that means that you've opened it and it's draining and it's not you know and then it will heal, but generally speaking if you have like an ulcer or a cut, you'd rather there not be pus there, honey.

Justin: That's true. Good point.

Sydnee: Yeah because then infection has occurred. Generally.

Justin: Yeah.

Sydnee: Yeah. So, so pus is usually a bad thing but there was the concept of pus being a sign of healing. Too much was bad, but you wanted some pus.

Justin: Like the pus is how you know it's working.

Sydnee: Right.

Justin: Okay.

Sydnee: This concept is really interesting because this hung around in wound healing for like 3000 years. The Romans would call it laudable pus.

Justin: Laudable pus.

Sydnee: Your pus is laudable.

Justin: That was actually my nickname on the high school basketball team.

Sydnee: I'm sorry, honey. This, this would hang around until like the 1500s when French surgeon Pare finally said I think this is wrong.

Justin: Listen.

Sydnee: I think maybe we should not be encouraging so much pus in all of these open wounds.

Justin: We've gotten terribly wrong.

Sydnee: If you— let's say that you had an open cut or what we would call laceration.

Justin: Okay.

Sydnee: Like a cut that needed to be closed, and not all wounds need to be closed, but let's say that this is a wound that needed to be closed.

Justin: Stitches.

Sydnee: Yes, but do you know what they would use as stitches at times in ancient Egypt?

Justin: No.

Sydnee: This is maybe my favorite thing I learned.

Justin: Tell me.

Sydnee: Ant pinchers, pincers.

Justin: [whispers] Really?

Sydnee: They would take an ant and like grip the bottom of it and like hold it's little like mandibles, it's little— you know its little pincers open—

Justin: Yeah.

Sydnee: And then make sure that those kind of get on either side of the wound and then like let them squeeze together to pull the wound edges together.

Justin: [whispers] You're kidding me.

Sydnee: And then once they had it in place they would just yank its little head off.

Justin: [whispers] That's mean. Very mean.

Sydnee: And just leave the pincers there.

Justin: That's mean bud.

Sydnee: And do it— that's the, those were the sutures.

Justin: That's wild.

Sydnee: Right?

Justin: That can't be true. I don't believe that.

Sydnee: I have seen pictures of this done in modern day.

Justin: Really?

Sydnee: Yes. You can look that up like ant pincers used as sutures and find images of this if you're interested.

Justin: That's so gnarly. Wow.

Sydnee: I mean and it, as far as like the wound healing aspect, I don't, I don't know how that would work like 24 hours, 48 hours, a week later, but

it, it will pull the edges of the wound, approximate the edges of the wound. It will do that. They will pull them together.

Justin: That must be confusing for any ants.

Sydnee: [laughs]

Justin: It's like, "Okay well that's good but now what animal's pinchers are we gonna get to hold Greg's neck shut? Because now Greg has this issue. Are there smaller ants that we don't know about, whose pinchers we can use to hold Greg's neck all shut?"

Sydnee: Now, there are smaller and smaller ants.

Justin: I guess you'd need to find like wicked small ants, huh?

Sydnee: Mm—hm.

Justin: Poor Greg.

Sydnee: So, uh the, the Greeks were the first to introduce the idea that wounds should be kept clean, so they actually advised washing with boiled water, wine, vinegar. This idea that like remaining—keeping the wound clean throughout the duration of its healing was actually important.

Justin: It's good.

Sydnee: They also kind of distinguish between an acute wound and a chronic wound, which is really interesting because you do manage them differently and they, Hippocrates talked about that, like there were different cures and poultices and herbs recommended for wounds you just got as opposed to like a chronic ulcer that wouldn't heal.

Justin: Hmm.

Sydnee: That kind of thing. Hippocrates specific note on chronic wounds for an obstinate ulcer, "Sweet wine and a lot of patience should be enough".

Justin: That doesn't make any sense Hippocrates. I don't understand what you're saying.

Sydnee: On the flipside, sweet wine and a lot of patience is probably enough for most things in life.

Justin: [laughs]

Sydnee: I don't think it's bad advice if you have no idea what you're doing.

Justin: Right.

"Oh no, the sweet wine's for me, and also a lot of patience is for me, the doctor. I have no idea what's happening."

Sydnee: "I don't know. We make this up as we go along at this point of history. I don't know if you've heard. Things get worse before they get better."

Justin: "Sorry."

Sydnee: "Sorry."

Justin: "Not for many millennia. Anyway, here's your sticker."

Sydnee: [laughs]

Justin: "You did a great job."

Sydnee: The Romans introduced what we consider in medicine kind of like the cardinal signs of inflammation. So, if a wound is inflamed, you look for redness, you look for heat, uh pain, um swelling. Rubor, calor, dolor, and tumor. Those are classic signs of inflammation, and Celsus introduced this concept and this was very key to the idea of like following a wound and seeing if it was healing appropriately or something had gone wrong. From there it broke down into like some like Celsus advised using honey and bran or cork and ashes on wounds were common things. Galen continued the vinegar and wine theme. That was very popular.

Justin: Mm—hm.

Sydnee: Pliny the Elder, one of our favorites.

Justin: You know we had to get his beak wet.

Sydnee: You know what's really disappointing is that I read everything from Natural History I could find, that's Pliny's big book, on wound healing and various things to put on wounds, for just one of those good old like Pliny the Elder wacky—

Justin: For some of those good old stinky gems.

Sydnee: Whacky like, "What are you, what are you thinking Pliny? Why?" And he really let me down this time. He would often say just let it breathe and leave it open, and it will probably heal.

Justin: [sigh] Fine.

Sydnee: And then even in his variety of actual treatments for wounds, and there are many. There are extensive lists. It's really just various herbs or roots mixed with honey. Almost every single one ends with "And add some honey." So, it's really hard to poke fun at old Pliny with this one because, I think it was really just about the honey.

Justin: Man.

Sydnee: And then he would throw in different herbs depending on like what location of the body or what caused the wound.

Justin: We'll get you next time Pliny.

Sydnee: Yeah.

Justin: That's all right.

Sydnee: So, Pliny you get a pass on wounds.

Justin: Not every porkchop is perfect. Uh, uh if every porkchop were perfect we wouldn't have hotdogs, so, so there.

Sydnee: That's true.

Justin: Steven Universe says.

Sydnee: That's good advice Justin.

Justin: What about after uh after the uh, those Romans there?

Sydnee: Well things as I've already alluded to, things are gonna get worse before they get better.

Justin: Nice.

Sydnee: But—

Justin: My middle ages.

Sydnee: Yep, but before we get to the middle ages, let's hit the billing department.

[theme music plays]

Justin: Okay Syd, I'm fired up. You know the middle ages is always the worst. What do they got this time?

Sydnee: Well overall in the middle ages as you may imagine techniques were not greatly improved. Uh there were some things that were still being gleaned from like the writings of ancient Greece and Rome, and were still being used to like linen dressings, wine, lint, um honey, you know.

Justin: Yeah.

Sydnee: Those kinds of things that were persisting but as far as advances in the field there generally were not a lot at… period.

Justin: On anything really.

Sydnee: Really.

Justin: Yeah, it was rough.

Sydnee: They were still debating about you know, should we, every time somebody gets a wound should we sew it up? Should we leave it be? I don't know.

Justin: [mumbling] I dunno. It's the middle ages man. Just figure it out.

Sydnee: And, and part of that is that at the time a lot of kind of magical thinking overtook scientific inquiry. Um, the use of charms to ward off you know infections and that kind of things or just things like prayer, you know. A lot of, a lot of treatments were religiously motivated so, you know, go pray and you'll get better or you won't.

Justin: Oh.

Sydnee: That's pretty much it. The dominant theory in medicine at the time was the humoral theory, so—

Justin: Yeah.

Sydnee: The four humors.

Justin: Four humors and balance.

Sydnee: Exactly so treatments for that usually included like, bleeding the patient or cupping, things that would make you puke, things that make you poop, things that would make you pee. That kind of thing and even for wounds, it's really interesting that bleeding would be used for wounds, but it was.

Justin: Yeah.

Sydnee: I have a wound. It's bleeding.

Well, let me cut you somewhere else.

Justin: Good news. My treatment is already working.

Sydnee: Now there were— I, I found this interesting, so one common wound problem in the middle ages were arrow wounds because I guess the longbow was a popular weapon at this point in history, and so the way that a wound— the way that an arrowhead was attached to the shaft was usually with like beeswax or something, so it wasn't there that tightly. I mean it, they usually would stay on for like the duration of the—

Justin: They got the job done.

Sydnee: Yes. I mean they flew through the air and landed in a human if your aim was good. So, they did the job from that perspective but—

Justin: And you're aiming at a human. Because it may have been a warning shot you were trying to do. You were trying to do.

Sydnee: That's true.

Justin: Trying to spook them.

Sydnee: So, it, that really depends on your aim though. That’s not the fault of the arrow.

Justin: Fair.

Sydnee: But the problem is, if you got shot and you didn't die and then someone was trying to treat for that arrow wound they would probably try to remove the arrow. That was usually the first thing to do and if you just grabbed the arrow and pulled, well other than the fact that there were arrows with hooks and barbs and all kinds of—

Justin: Yeah, and the flesh would get caught. Ew.

Sydnee: Yeah, all kinds of awful things like that. The other problem is that the head of the arrow would often just come off.

Justin: Mm—hm.

Sydnee: So, you would get the shaft out, but you still have this arrowhead lodged in your body somewhere.

Justin: And every metal detector from then on out is gonna be so annoying.

Sydnee: So, and I mean it's not like the arrows cleaned to begin with so like this is bad. This is— we're in a bad— you're in a bad way.

Justin: Yeah that's rough.

Sydnee: So, one specialized instrument that was invented at this time in history was called the arrow spoon

Justin: Okay?

Sydnee: Which was uh a kind of a hooked, a long—hooked instrument, and the way you would use this is first you would want to widen the wound some.

Justin: Okay?

Sydnee: So, you would wanna kind of just probe around the arrowhead and just like push out—

Justin: Groovy. Okay. I love it.

Sydnee: So that the wound got a little bigger.

Justin: Yes.

Sydnee: And then you would use this spoon device to kind of hook underneath the arrowhead and then yank it out of there. And there were different variations. There were some that even had like screws in them and you would try to like insert them into the arrowhead and screw them it, then pull them out that way. And then—

Justin: Luckily the patient had been anesthetized.

Sydnee: We had no anesthesia.

Justin: Mm—hm.

Sydnee: They, if they were lucky they had a stick to bite on, and after you got the arrowhead out if your patient has survived this then, of course, the natural progression you would take a hot iron and stick it in the wound—

Justin: To cauterize it.

Sydnee: To cauterize it. To stop the bleeding.

Justin: Cool day.

Sydnee: So, is that an advance? I don't know that we can count that as an advance.

Justin: No. No.

Sydnee: It was a tool that got a job done [laughs].

Justin: It did something.

Sydnee: I would not call it an elegant tool.

Justin: No.

Sydnee: And probably not really a multitasker there.

Justin: No, just that one—

Sydnee: Just that single use.

Justin: Maybe if you needed a melon baller on a short notice it would work.

Sydnee: Uh now I will say that as we move into like the 1400s we see the concepts of debridement, meaning cleaning up like, dead tissues and stuff from the wound that is inhibiting healing.

Justin: Hm—mm.

Sydnee: Getting rid of that without actually just kind of cutting the whole wound, you're just getting rid of the stuff that's gonna stop it from healing.

Justin: Great.

Sydnee: And um cleansing it and trying to like recognize that there is a certain kind of tissue that means the wound is healing call granulation tissue. It's like pink fresh-looking tissue on the edges of the wound.

Justin: Okay.

Sydnee: That use— that's a good sign. And if you see that like encourage that. Keep that growing and get rid of the dead stuff.

Justin: Okay.

Sydnee: If there was that recognition by English surgeon Thomas Morstead all the way back in the 1400s.

Justin: Well that's something.

Sydnee: And then during the 1500s that's when we get into Ambroise Pare who revolutionized wound care, not just with the ideas I mentioned earlier that pus is not a good sign and we should not try to encourage things to… to be infected.

Justin: Pus up?

Sydnee: But [laughs] but by encouraging just like basic, basic care things like good nutrition, sleep, better dressings, um ligature, the idea of ligating blood vessels as oppose to cauterizing them. Don't just burn a wound to stop it from bleeding. You could actually sew like um like sew up vessels.

Justin: Mm.

Sydnee: To stop them and that doesn't do as much tissue damage obviously um and then the idea of like a pressure ulcer, something that had develop from just putting too much pressure on it like something that had

been laying on a bed, a bedsore, for a long time. Just offload the pressure. So put a pillow under their leg or something and get their heel off the bed. Revolutionary idea, so simple.

Justin: There we go.

Sydnee: There you go. Um it wasn't until as we move into like the 18th century, surgery was really its own field at this point.

Justin: Mm—hm.

Sydnee: And that's when you see more surgical involvement in wound care as I mentioned like the idea that we need to surgically clean certain wounds to allow them to heal. And then we move into things like the process of antiseptic technique and then after that things like antibiotics. And all that happened because in the 1800s and I think we've talked this before Ignaz Semmelweis the guy who told you to wash your hands.

Justin: Sure.

Sydnee: The revolutionary—

Justin: Much to the chagrin of everybody else.

Sydnee: Right. The revolutionary idea of wash your hand was introduced and then Joseph Lister was uh the one who said, "You know what? In the operating room we should wash things with certain," I think he was using things like carbolic acid or something, but anyways things to, to clean instruments and whatnot.

Justin: Mm—hm.

Sydnee: The idea that you know if your dressings and instruments that have been cleaned.

Justin: Perhaps not everybody wants gangrene.

Sydnee: Exactly um and then we get to Pasteur's germ theory of disease and we suddenly understand how infection is spread more or less.

Justin: It's rad for Lister, that he got that before Pasteur on his jam going. It's quite the call to shot.

Sydnee: Well, it's the same with Semmelweis. I mean he came up with the idea that washing your hands improved outcomes for patients without really knowing why, you know. And then this— and again this was a time when medicine where like the bloodier your coat was when you walked into surgery—

Justin: Right.

Sydnee: The better a surgeon you were considered to be.

Justin: You wanted it stiffened by blood. That's how uh—

Sydnee: Exactly.

Justin: Physicians, other physicians knew you were legit.

Sydnee: Exactly, and you walked into the O.R that way. Not out.

Justin: Not out. In.

Sydnee: In that way. Um as, as we look at advances in wound care from this point forward, a lot of it's traced to various wars. As you can imagine those were times where there were lots of wounds being created, and so a lot of advances were made kind of on the fly as to how to treat them. So, in the Civil War we see better bandages and iodine beginning to be used to clean wounds. In World War One we come up with something called Dakin's solution, which was created by English chemist Henry Drysdale Dakin and French surgeon Alexis Carrel. It was a solution of sodium hypochlorite, just sort of like bleach.

Justin: Okay.

Sydnee: It's basically, it's bleach, but it's like a dilute bleach. But anyway, Dakin's solution was good at removing dead tissue and leaving the living tissue safe.

Justin: Ah.

Sydnee: And it's still used ‘til this day in some cases.

Justin: Good job Dakin.

Sydnee: Yeah, so—

Justin: Crushed it.

Sydnee: So pretty cool. Um one, one side note that, that has happened already chronologically speaking but I wanted to give a little bit of time to it at the end of our show, are maggots.

Justin: Nature's bugs.

Sydnee: Micro-surgeons maybe.

Justin: Nature's micro-surgeons. Okay.

Sydnee: How about that. So, maggots, many people are kind of aware, maggots are used maybe. Did you know that maggots are still used today?

Justin: Uh, yes but I only know that because I'm married to you.

Sydnee: Okay. Maggots are, are, they really are nature's micro-surgeons. So, it has been noticed for hundreds of years that if a wound gets infested with maggots, fly larva, in some cases it actually does a little better. This is because maggots are very good at eating only dead tissue. They don't eat living tissue.

Justin: Not interested.

Sydnee: And—

Justin: They only want that good dead stuff because they nasty.

Sydnee: As [laughs] as I've mentioned getting the dead tissue out of the wound is very important to the healing process. So myiasis or the wound being infested with larva, myiasis, or just being infested with larva in genera,l has probably been noticed for, I mean, thousands of years certainly. There's some evidence that maybe the Mayans and some of the aboriginal tribes of Australia knew about this and utilized this technique for a long time, but the first time we actually have recorded, "Yes maggots are good for wounds use," dates back to Napoleon. In 1829, Napoleon surgeon general Baron Dominique Larrey described wounds on the battlefield that have been infested with fly larva that actually seemed to do better than wounds that weren't infested with fly larva.

Justin: Uh huh.

Sydnee: And begin to theorize that, that the larva were doing something to the wounds that were actually, that was actually helping. So, in the Civil War there were actually times where blowfly larva were introduced into wounds.

Justin: Mm.

Sydnee: To clean them, and then again even more so in World War One, American surgeon William Baer noticed that soldiers who had maggot infested gashes didn't seem to have the infection issue or the swelling in the wound that patients that didn't have maggot infested wounds.

Justin: God, the willpower it would take to not just knock those bad boys off. Ugh.

Sydnee: [laughs] So, not only did he not knock 'em off but Doctor Baer actually started using this um in, at Johns Hopkins in 1929. He actually was mainly using it, he was working at the, the associated children hospital and using it in cases of like chronic wounds with osteomyelitis which is an infection of the bone in children. And uh—

Justin: Nurse, this patient is very serious. Bring me my giant box of maggots I keep in my office.

Sydnee: But this— he was getting, he was getting really great results from this. His— the wound, the wound healing process was greatly improved at his facility and in the patients that he, he tried this with. So, within five years of him doing this and publishing it, over a thousand American, Canadian and European surgeons were using maggots in their practice.

Justin: Ugh.

Sydnee: For wound healing.

Justin: Great. I believe it. Great.

Sydnee: Um a lot of hospitals started to operate their own insectaries to grow and utilize maggots because you don't wanna go like scrape them off roadkill.

Justin: You want them on the, at the ready.

Sydnee: You want them sterile. You want them clean.

Justin: That's fun gig.

Sydnee: It's not good to go get them off like dead animals out in the wild.

Justin: Why? I thought they were so great at eating only the dead stuff.

Sydnee: Only want, we want the clean larva, and there was even a lab that, that opened, a Lederle Labs in Pearl River New York where you could get your supply of surgical maggots if you needed them. If you didn't have an insectary. So, from 1931—

Justin: Did they transform into blowflies when you're cured? That's how you know, like they've had enough of you and they're—

Sydnee: That sounds like magical thinking.

Justin: Yeah.

Sydnee: They will uh, I mean they will at some point become flies.

Justin: Right, and then they'll leave. They grow up so fast.

Sydnee: The uh— so, so by 1931 it was pretty commonplace um sterile maggots of the green bottle fly are the most common— I think persist as the commonly used. Lucilia sericata is the, if you're interested in that kind of thing, what kind of fly is used.

Justin: No, I'm not.

Sydnee: It— and you really see like this, so 1931 it's introduced. Everybody is raving about this new therapy.

Justin: Wild for it.

Sydnee: It really dies down in the 40s with the introduction of antibiotics.

Justin: Don't need you maggots anymore. Close the insectary.

Sydnee: Because everybody thinks, "Well, we'll just—"

Justin: Stinky, stinky Doug's out of the job.

Sydnee: We'll just give you antibiotics [laughs].

Justin: Our lead insectician, Stinky Doug.

Sydnee: But that was, it was kind of a misunderstanding of what they're doing because they're, they're cleaning up the wound, they're cleaning up dead tissue. Antibiotics don't do that. They might kill bacteria, but they don't clean up dead tissue the way that maggots do. So, there was still this undercurrent of people insisting there's probably a place for this in medicine and then it wasn't really until the FDA approved it again in I think 2004.

Justin: Wow.

Sydnee: Yeah. That recently. When they said, "You know what. You're right. There is a place for maggot therapy, and it can be reintroduced." So maggot debridement therapy or MDT is what we call it now, you introduce up to a thousand maggots into a wound, you leave them there from anywhere from one to three days at a time, and you can use it for any kind of wound that has like, like I said, dead tissue, the skin is kind of sloughy, there's pus, you know something that needs to be cleaned up.

Justin: Mm—hm.

Sydnee: This would be alternative to other ways, other surgical methods of cleaning up a wound or other um not even surgical, chemical methods of debriding a wound. The neat thing is that we have a lot of studies that say it does in fact help. That it reduces um, the intense pain—

Justin: Mm—hm.

Sydnee: From some of these wounds. It reduces the odor.

Justin: Sure.

Sydnee: That's nice, and then eighty to ninety-five percent of cases, a complete or significant debridement of the wound is achieved.

Justin: All right.

Sydnee: Yeah, so it actually is pretty successful if using the right case.

Justin: Not bad.

Sydnee: It reduces your risk of amputation.

Justin: Nice.

Sydnee: Which is great. It reduces your risk of bacteremia, which is an infection in your bloodstream, and um the only real side— the only real side effect, well there are a couple. One, there are some people who have discomfort with it.

Justin: Okay.

Sydnee: Not a lot. Not as many as you'd think. Twenty to twenty-five percent, but uh—

Justin: Ugh. I think some people are fibbing honestly.

Sydnee: Well, I would assume it would be higher.

Justin: Yeah, no kidding.

Sydnee: But um—

Justin: I wouldn't. No way. All you need is stitches, it's 2017.

Sydnee: But—

Justin: Stitch me up.

Sydnee: And, and it depends on the wound. I mean if you have like exposed nerves and things and you got a maggot crawling across it that's probably gonna cause some pain, but if you're talking about something like a chronic diabetic foot ulcer, that patient may not have any sensation left in that food. They may have such severe nerve damage that they're not feeling anything and so in which case you probably wouldn't have more pain from maggot therapy. So, it depends on the wound and the patient. There are some other drawbacks. Medicinal maggots are alive, and so you have to ship them there—

Justin: Alive.

Sydnee: Assuming you don't have your own in your own lab which most hospitals don't. Ours doesn't, but you have to ship them there alive and you have to care for them and make sure they maintain their living status.

Justin: Keep their spirits up. Play them music.

Sydnee: So about one percent arrive dead. That's actually, again, not as bad as I would have assumed.

Justin: Yeah.

Sydnee: And also, through because they are live they can escape. They do move.

Justin: Fun. Okay, great.

Sydnee: And once they escape I saw them called mobile fomites, meaning that a fomite an object that can spread disease, like a white coat is a classic example of a fomite. That's why we're, that's why there's more and more studies encouraging us to be careful about wearing white coats because we're going in and out of rooms wearing white coats and spreading disease maybe on our white coats. They're a fomite.

Justin: Yeah.

Sydnee: Well these are mobile ones.

Justin: Yeah.

Sydnee: So, they're, they're covered in infectious material and they move.

Justin: Let's all agree they're a mobile fomite when they brought them in gang. I mean let's be honest they, and now they're bugs. No, they've been bugs the whole time. You brought bugs in your hospital clever girl. Come on.

Sydnee: So, you have to keep the dressing over top of them pretty tight to keep them in place. You don't want them wiggling away. Um and if they do wriggle away, uh fugitives is what I saw them referred to in some of the papers. If you have fugitives, I mean they will become flies.

Justin: Perfect.

Sydnee: Which is not great in a hospital.

Justin: Yeah. And then somebody's just gonna swat them. It's like that's a doctor. What are you doing? That maggot is a doctor.

Sydnee: You know and then a lot of people— there are a lot of papers that talk about the yuck factor.

Justin: Mm—hm.

Sydnee: It actually tends to be a bigger problem for the doctor than for patients who get maggots debridement therapy.

Justin: Ah.

Sydnee: In general. Most patients tolerate it pretty well, and if, and if it's working I think and you're able to avoid amputating your foot or something then it's worth it. Um but they do have like, special dressings to help cut down on that. Sort of like a double-sided enclosed kind of dressing that you can like peel off and apply to the wound. There are ways to do it so that the person applying the dressing and patient themself never really see the maggots.

Justin: Mm—hm.

Sydnee: They have all kinds of advanced encasement dressings that you can put on and the maggots are there and they're doing their thing, but you don't really see them.

Justin: Don't lie to me. That's no good. Don't lie to me.

Sydnee: So.

Justin: Um, well Syd that was all very grody.

Sydnee: [laughs] Sorry about that.

Justin: I hope you're proud of yourself. Uh thank you for listening to Sawbones. Uh, a couple of things going on that we're going to tell you about. It's not too late, we're gonna be at PodCon this weekend and you can, if you can get out there to Seattle I think they got tickets at the door, or you can go to podcon.com and you usually get a remote ticket and you can listen to a lot of the shows and enjoy them right from the comfort of your own home. So, it's gonna be cool. Check it out. PodCon uh MBMBaM's gonna be there. Still Buffering, you can go see them live. Get some stuff signed. You can uh see uh we're doing an Adventure Zone discussion. Not a, not a live Adventure Zone but we're doing a talk about it. A bunch of panels and stuff. Night Vale is gonna be there. Hank and John Green are gonna be there. It's gonna be fun, so.

Sydnee: And we're doing a live show.

Justin: Ah yes, Sawbones. The podcast.

Sydnee: Yeah.

Justin: Is gonna be there. So, uh check that totally at podcon.com. I also wanna mention uh, it's Candle Nights season. We're doing a live Candle Night show in Huntington. It actually sold out pretty quickly, so for other people that want to get in on the holiday spirit Sydney's sister Rileigh, also from Still Buffering, organized a fundraiser called Be a Candle Nights 2017 Star and you can— the way it works, you can kick in five or more dollars towards the uh towards the cause, which I'll tell you about in a second, and you can get a star on the Candle Nights tree, and the cause is Big Brothers, Big Sisters of South Central West Virginia because when they started supporting uh offering more services and got a grant for LGBTQ+ youth um they were actually had a big donor pull $80,000 away from them because of that work.

Sydnee: And that, that is severely impacting their ability to provide services in general to, to kids in the area.

Justin: So, all of Candle Nights is gonna go to them. All the ticket sales, all the merch, and this Candle Nights 2017 Star. You can get yours at bit.ly/mbmbamstars.

Sydnee: Uh, can I also say I was on a different podcast.

Justin: [gasp] How dare you?

Sydnee: Sorry about that, but uh if, if you feel so inclined you can hear me on Court Appointed next week. They publish this coming Monday where my dad and my uncle Michael who is an actual real deal lawyer. My dad is not but he makes lots of dad jokes. Uh talk about vaccine law and I'm there for the science. You can check that out.

Justin: Excellent. And you can find that at iTunes.

Sydnee: Yes.

Justin: Search for Court Appointed, and folks that is gonna do it for us. Um thank you so much for listening. Thank you to you at home just for being you, but also for, for helping to spread the word about this show, rating our show on iTunes, tweeting about it, et cetera. Um but uh that's gonna do it for us. [Music plays] So until next week, my name is Justin McElroy.

Sydnee: I'm Sydnee McElroy.

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

[Intro Music ends]

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