

ENQUIRING MINDS**EQM EP 2 SEG 2**

HOLLY: Ever wondered what happens when someone breaks a bone in their arm or leg? Well, Lockie and Yang Yang are about to find out.

LOCKIE: I bet most of us have dressed up as doctors or nurses and played hospitals at some point in our lives. Those real life roles are so important to help sick patients get better. But did you know that robots are being used as test patients and to help doctors with their work during surgery? I'm about to meet a fourth grader who wants to be a doctor and we might have a special surprise for her at a pretty cool hospital later on. So Yang Yang, why do you want to be a doctor?

YANG YANG: Because I want to learn to heal people and learn about medicines and using big machines.

LOCKIE: So what's this here?

YANG YANG: A kit with some medicine things.

LOCKIE: It's a doctor's kit?

YANG YANG: Yeah.

LOCKIE: Cool. What do you think about meeting a real doctor who uses these kind of tools?

YANG YANG: I'd be very excited because I get to kind of learn a bit more about doctors.

LOCKIE: Would you like to go meet a doctor now?

YANG YANG: Yeah.

DR JOHN: I like people, you know, and I like helping people that are really sick. I like to help them to get better. We talk about team work in medicine and in surgery and usually when people think about teams they think about opposing teams but the nice thing about team work in medicine is that there's only the one side. It's a lovely thing to be part of that.

LOCKIE: Hi, Dana.

DR DANA: Hi Lachlan, how are you?

LOCKIE: Good, thanks. I'd like to meet Yang Yang.

DR DANA: Hi Yang Yang, nice to meet you.

YANG YANG: Nice to meet you too.

DR DANA: So what are the most common types of breakages in children, what bones do you they usually break?

YANG YANG: I think their arm and their leg.

DR DANA: An arm and a leg. Well you're right. Children do actually break their arms and legs quite often. In adults you see other breakages as well such as the femur, the thigh bone. Today we're going to be breaking a femur and put it back together again.

LOCKIE: How are we going to break that bone?

DR DANA: We'll be using the Instron material testing machine and we're going to apply a load to the head of the femur and hopefully it will fracture.

DR JOHN: These bits of equipment we use to test what we call the mechanical properties and measure what's happening.

DR DANA: I'll just give you a lab coat. I'll also get you some safety glasses.

YANG YANG: How strong is the human bone?

DR DANA: The human bone can actually take up 4 to 5 times body weight but what's important is the impact that the bone experiences. That's what breaks the bone. Okay, so I'll get you to click okay. Okay. There you go. Fractured.

YANG YANG: Once the bone is broken what do you do after that?

DR DANA: Well, we've got to put it back together again and in this case we're going to use what is known as a sliding hip screw. This is the femoral head that snapped off, have to put the lag screw in here. It will sit like that and then we have this part that sits in there. Now we need to put some screws in. Can I get you to put that one in here and then I will get you to screw that one in with this.

LOCKIE: So once a plate's been inserted does this stay in for the whole time or does it come out again?

DR DANA: Basically, yeah, it stays in. There's a bit of sliding allowed which allows bone to grow between these two surfaces. Fantastic. Great job there.

LOCKIE: What sort of role do robots or machines play in this kind of work that we're doing now?

DR DANA: Well, a lot of surgery, orthopaedic surgery nowadays does use robotics, use navigation to position implants. It's definitely an area that is growing. Okay, that looks pretty stable. How about we go and X-ray it? See what it looks like?

YANG YANG: Yeah.

DR DANA: Okay.

DR JOHN: The good news is that it will heal pretty much in whatever position we put it in. If you just let it heal the way it is it will heal in a funny angle and so we go to some trouble to line the bone up again and give it the best chance of being a straight line and lasting you for the rest of your life if it possibly can.

DR DANA: So I've got you both in these suits. These are lead gowns because we're going to be taking an X-ray. As you can see the implant is sitting against the bone and the screws that we inserted. It's not bad, not looking bad. And also you can see the fracture. So looks really good. Hello, John.

DR JOHN: G'day.

DR DANA: This is John the surgeon who is going to take it from here.

DR JOHN: But first we've got to change out of our street clothes and put some special pyjamas on.

LOCKIE: So John, what can you tell us about this?

DR JOHN: It's a hat. And it's actually to stop bits of hair and stuff falling into the patient. I'm afraid, Lockie, I'm going to have to ask you to put a mask on as well.

LOCKIE: Okay.

DR JOHN: We need one more thing, a headlight. Now we're going to get really clean and this is called the surgical scrub.

YANG YANG: Before you do the operation how long does it take?

DR JOHN: It does seem to be taking a long time, doesn't it? But normally even if you're in a hurry you would spend 5 minutes washing your hands, a full 5 minutes. I'm afraid you touched the spout, you have to start again.

LOCKIE: It's like never ending washing.

DR JOHN: I didn't actually decide to be a surgeon until I was a medical student and had the opportunity to go into an operating room. And what they were doing really was important, you know. It was life or death. So here we are, operating room. And our patient whose name is Sim Man.

LOCKIE: Can you tell us how helpful Sim Man is in teaching surgery to students?

DR JOHN: We use him for so many different things, so you can hear his nice

steady heart beat. He can have a heart attack and then we have to use all of the tools and drugs and things that we have up here to bring him back around and all of this requires us to talk to one another, to communicate, to work really, really well as a team.

YANG YANG: Is he really close to a human patient?

DR JOHN: It's a good question. In some ways he's better than a real human patient because he can get really, really sick again and again and again and again and we can practice making him better. That's the main reason we've got him here. He looks like, you know, a 32-year-old rugby player but we can make him behave like a, you know, little old lady who has broken a femur as you did earlier on today. Would you like to operate now?

YANG YANG: Yep.

DR JOHN: Yeah, I thought so. Here's a scalpel, we call it a knife. So you want to hold it with your finger tips. I want you to just cut that skin. One of the things that makes medicine such an interesting place to work is some people are particularly good with their hands and they make good surgeons or radiologists or cardiologists, other people are particularly visually orientated and find themselves doing radiology or pathology. Other people will do psychiatry, they won't even touch a patient but will influence them through talk and ideas. I want you to hold the scissors as if you were going to cut something. Good. What I liked about that was that you were holding them with your fingertips. Remember we said the tips of the fingers was where the sensation was and if you hold them with your fingertips you can put them down and if you don't want to use it anymore for a little while you can just hide it in the back of your hand and just use the rest of your hand to operate with and

there they are.

LOCKIE: So what's next?

DR JOHN: Well I think we need to know how to use a forcep and we're going to hold it as if we hold a pen with the fingers curved so that we're using our fingertips.

YANG YANG: What material do you use for the stitches?

DR JOHN: Just about anything that I choose. So this is polyester. This is something that's not really going to degrade. So if we put these stitches in we'll have to take them out in a week's time. A week because that's how long it takes to heal. We could put something in that's biodegradable that just rots away in a couple of weeks and that way we wouldn't have to take those stitches out. Now, see how we're holding this needle right on the tip, this is not at all easy. Turn your wrist, perfect, that's exactly right and then I want you to do something that's a bit tricky. I want you to hold this about 10 or 15 cm away and I want you to do two turns around it and grab that. Just closed enough to hold on to that and then I want you to do this. Very nice.

To be a doctor you have no choice you have to study at a university. I enjoy having helped people, I enjoy bringing younger doctors on, showing them how to do something that they didn't know before.

You know how important practice is here and you've started today, I want you to keep practising, okay. And I'd like you to take this needle holder and put it in your pink doctor's bag.

YANG YANG: Okay.

DR JOHN: And practice, okay.

YANG YANG: Okay. Thank you.

LOCKIE: It looks like Yang Yang's had a full day learning about doctors, surgery and the Sim Man and it's pretty cool to think that one day she could become a surgeon just like John.

HOLLY: Next episode – Sacha learns a few fashion tips and I'm off to meet Fabian who gets up close and personal with tigers. Thanks for joining us, see you next time. Bye.

VOICE-OVER: If these stories have inspired you then check out our website for activities and loads of information on all of our experts. Plus, don't forget to challenge yourself with our Enquiring Minds game.

END OF TRANSCRIPT