

>> Okay, so this last part of digestion, we're going to talk about accessory organs: the liver, gallbladder, pancreas. Each of these secrete digestive enzymes to help with digestion of course. So the liver – please know – the liver has two functions, two main functions. One is to produce bile. Bile is made in the liver and stored in the gallbladder, and it's released into the small intestine to help you digest fats, okay? If you've had your gallbladder removed, it creates some problem in that when you eat a fatty meal, rather than the gallbladder squeezing little bits of bile into the small intestine, usually it releases large amounts and it can create cramping and nausea and other problems. But again, you know, you can prevent getting your gallbladder removed, getting gallstones, by having a healthy diet. Usually, it happens in people that are overweight or eat a lot of sugars, the wrong types of fats. But bile breaks down fat, like I said. The liver also helps to detoxify your blood. So it breaks down and neutralizes any toxins, any substances that was in your food that you don't want. It also helps detoxify alcohol and medications. Your pancreas produces insulin and glucagon, like we talked about. It also produces digestive enzymes. So those are the two things the pancreas does – that's it, okay? Let's talk briefly about the lymphatic system. The lymphatic system, you probably are familiar with lymph nodes? That's part of the lymphatic system. The lymphatic system is similar to red blood cells but it basically has no – it has plasma. It has white blood cells but no red blood cells and no platelets. So it's basically to filter substances – fat, we talked about – but it also helps fight against pathogens, against bacteria and viruses and similar. Again, it's basically similar to blood in that it's got plasma, it's got white blood cells which fight infection but no red blood cells and no platelets, okay? And I'll go through a little bit more of that in a minute. The lymphatic system is all wrapped around your small intestine – picks up, like I mentioned, fat to filter it – also helps defend against pathogens. So that's a picture of the lymphatic system. It's throughout your whole body. It's pretty much everywhere. Again, it helps filter out bad things. There's your lymph nodes. You know, under the armpit here, you – usually, women that get breast exams, they will also look under the armpit and make sure you don't have palpable lymph nodes there. That could be a bad sign. So you don't want that. The ones you might feel – maybe when you're sick, you might feel a couple under your jawline there. Some thin people might feel some in the inguinal area, but you shouldn't feel it. You hear sometimes people get cancer and it's gotten into their lymphatic system or the lymph nodes and that's a really bad sign because then it can spread through the body. So your immune system is made up of white blood cells that help fight infection and bacteria and so forth. Your immune system also is made up of the lymphatic system. Your skin – your skin helps protect against pathogens from getting into your body. Your intestinal cells, we'll go over that in a minute again and the mucosal cells, they all help make up your immune system, which fights against bacteria, viruses, cancer cells, allergens, toxins, parasites, all that. So, you know, if someone gets cancer it's a problem with your immune system. Your immune system was weakened to the point that it could not identify a cancerous cell and kill it off. Because we produce cancer cells every day but most of us have a strong immune system, can

recognize it, and kill it off. So the skin, like I said is – you know, it’s a barrier. It helps keep bacteria out of our body. If you have a cut, now bacteria can get into your system so – and you want to keep your skin healthy. You don’t need to know this for the test but dry skin is usually caused by a deficiency of the essential fatty acids, which we’ll go over in chapter 5 – but basically the healthy fats: fish oils and oils from nuts and olive oil. We’re not deficient in lotion (skin lotion), we’re deficient in healthy fats. When your skin is dry, vitamin A and zinc also help keep your skin healthy. Your intestinal cells are definitely part, a big part, of the immune system. Because think about it, we touch our fingers that have bacteria on it or viruses, we eat foods with bacteria in it or parasites – hopefully not, but it happens. And hopefully, if you have healthy intestinal cells, where these cells are packed closely together there’s no space for these pathogens to get through into the bloodstream, to sneak on through. And I’ll show you what that looks like. Here, as you can see, these all the villi. This is lining the small intestine – all the villi, those fingerlike projections. And you see how your there’s no spaces. They’re packed real close. So when you eat foods, you’ve got all your carbs, fats, proteins normally. Those foods get properly digested and they absorb through the villi and get into the blood. But if you have nutritional deficiencies, these villi aren’t being supported well and they break down. There’s spaces here. Some of these undigested foods, particularly proteins, can flip through the space and get into the bloodstream and create all kinds of health problems: autoimmune diseases, allergies, and all sorts of things. So we call that leaky gut. You can Google that and see what that means, leaky gut. But again, that’s something alternative doctors help deal with and how do you help patch up your immune system in the gut? So, like I said, if you have nutritional deficiencies, it can break down those intestinal cells and then the bacteria, the viruses, parasites, and so forth can get into the body more easily, causing all kinds of things: diarrhea and other problems. So you want to keep your digestive tract healthy. Eating a protein and getting enough vitamins and minerals. Okay, slide is not – here we go. Okay, the white blood cells, most of you are familiar. If you get sick, you have a cold or the flu, they tend to increase in number because they’re helping to kill off the bacteria. And you have to keep, you know, good nutrition to keep those white blood cells healthy and be – your body be able to produce enough. You don’t need to know this for the quiz but, again, it needs several different vitamins and minerals and enough protein. Lastly, you might’ve heard the expression, “you are what you eat.” But now, hopefully after this chapter, you understand that you actually are what you absorb. Because you can eat great, you know, lots of different foods and whatnot, but if you’re not digesting and absorbing them, it doesn’t do your body any good. Okay, so if you have any questions, again, please email me or come by during my office hours.