



## Digestion: Assessment and Overview of the Digestive System

### Transcript

Hello and welcome to our Institute of Nutritional Endocrinology's *Digestion* Module. I am Dr. Ritamarie Loscalzo and I am thrilled to be able to present to you valuable information about digestion and how to understand how it works, to assess what is going on with your clients, and to help them put together protocols and processes, and diet and lifestyle changes, that help to optimize their digestion. Digestion is super important, and it doesn't always show up as digestive symptoms; so that is where you get to learn, and become the sleuth that helps your clients to overcome problems which may be related to the digestion, and they did not even know it was related to their digestion.

If you cannot digest and assimilate your food, there is no way that you can be healthy, no matter how good your diet is, no matter how perfect your exercise program is. Without digestion working, you just can't get well, and that's what you are going to need to get across to the people that you are working with. You really need to start with your digestion and make sure that it is working properly, even if they don't present with digestive symptoms. I am going to show you, as a go through the presentation, how some digestive problems may not show up as digestive problems so people are thinking they have perfect digestion, when in reality they have not. You are going to get the tools to have you feel really comfortable and competent with understanding what is going on with people's digestion and then knowing what to do about it.

As far as the evaluation, we are doing it on a level without labs. We are doing it with observations and symptoms. Later, when we start our module for *Evaluation*, you will get the deep scope on: how do you, and when do you need to, run labs for people to see what is going on with their digestion, and to clear it up. We are going to go superficial on the assessment, but deep on the protocols. Some of you have a very detailed anatomy and physiology understanding, and I didn't want to spend a lot of time digging into the basics.

### Anatomy and Physiology Resources

[www.DrRitamarie.com](http://www.DrRitamarie.com)



What I did was I prepared some materials for you so that you have background material, not only background material to fill you in if you are not quite as in-depth in anatomy and physiology, but even some if you are at an in-depth level, it is going to take you beyond. I found some public domain textbooks of physiology and anatomy. What I did was I pulled out the sections on digestion and all of these extra documents and videos can be found on the page called *Advanced Topics/References*.

*Anatomy at a Glance Digestion*. It is a 10-page document and it has some good pictures and descriptions. This one is a very nice chapter, about 25 pages, and it goes through everything in a really easy to understand way, so that you can study, you can go back, and you can really understand. If you are not sure it will help you to do that. This next one is really in-depth as well. It goes through more details of peristalsis and has pictures. You know how it is when you say you only remember about 7% of what you hear? The more you hear it, the more you see it, the more you are going to get it. If you go through these documents, and spend some time studying these, you are really going to get a feel for this; you want to be so familiar with digestion that you go, 'wow, I know this'.

I could not resist giving you this. It is a 500-page textbook. It is from 1910, a full physiology textbook. I did not just do the digestive part, but it is lets you see what was done in textbooks back then. It is always kind of fun and if you are interested it is there. It has all of the different physiology sections. You don't have to go out and spend \$200 on a really good anatomy and physiology textbook, you've got this. The next one is the anatomy coloring books. It has basic anatomy, and you can color if you want. It has some lines, and you can color in the picture, but don't look at the key. It has a key to let you know if you are right or wrong.

Finally this one is another quiz. It is a word file and you can just fill in on the word file and this is what it looks like. You can go into it and type. The other thing I did is, I spent hours and hours pouring through videos on YouTube and various other sites. Some of them are real basic, and some of them are really short, some of them are a little bit longer, but they are all really well illustrated but it actually gets you to see, in motion, the bullets of food making its way through the digestive tract, and really scoring things out. There are a whole bunch of them. None of them are more than eight minutes, I think that is the longest one; but it goes through everything, your basics, overall physiology, pancreas, digestive juices, you see the digestive juices squirting into the areas, and you actually get to see what is happening. It is kind of cool. It is actually what is happening. That is your pancreas, that is your gallbladder up here. Green is the bile, and the tannish is your digestive secretions that have



your digestive enzymes. I really love this, McGraw-Hill's online lessons. You may be interested in going through this. You can actually play the lesson which shows you all about the organs of digestion, but then they have others right there. They have little quizzes so you can quiz yourself. They have flashcards. It is more intended for school kids, but it certainly works for us. It shows you what is happening. I would suggest that you make some time in your schedule to take a look at these.

I am really excited about these worksheets. They all start the same with a little description of the problem. Then there is an evaluation section; how are you going to evaluate for this problem, what are some of the common causes, what are some of the lifestyle habits that you can do to heal this problem, what are some of the dietary habits, what are the herbs and nutrients that can heal this. You can put these in a little folder, and when you are working with people, you can use these as quick reference guides. Of course we know there is no protocol. There is not, everybody who has leaky gut does this or that. You are going to be modifying it for who they are, what their situation is, and their budget is going to play into it. But you are going to have the protocols right there in front of you of all the possibilities to hone in, then if you need to look up something in more detail, you can.

Instead of going through the entire digestive tract anatomically, then physiologically and then patho-physiologically-wise, I am going to go through them in sections because it keeps it more interesting. We're going to go through the upper G.I., the lower G.I., which would be the small intestine/large intestine, and then the liver/gallbladder. We are here to talk about digestion.

We're here to talk about digestion not from the standpoint of how you balance your own digestion although that is a big part of it. You want to be able to do that. But you are really looking at how are you going to be balancing your clients, and how you are going to be knowing when somebody comes in, do they even have a digestive problem, even if they are not presenting with a digestive problem. Some chronic health issues that people just cannot get a resolution for, that nobody really is helping them with, can turn out to be something like leaky gut, or a gluten intolerance. It is really important that you have the skill set under your belt to be able to handle this.

### Medical Disclaimer



As with everything, when you present to people as well, you should be saying, the presentation is not intended to replace a one-on-one relationship with a qualified health care practitioner. It is not medical advice. What we are talking about is sharing of knowledge from my knowledge bank to yours, so that you may then share it from your knowledge bank to those of your clients. We are not diagnosing, we are not ever telling anybody to get off of medications because this 'great' herbal treatment is better. We are just opening up people's awareness, so if they are under the care of a doctor, or on any medication, that they check with their doctor before they begin any major lifestyle changes.

### Why Study Digestion?

Let's begin with why are we even studying digestion? There is so much to digestion. It is not just a food getting into you. **Digestion affects your brain.** There is actually shared embryologic tissue that, when we were in the embryo forming, there was a piece of tissue that diverted out to become brain and gut, and they are connected via the vagus nerve. The vagus nerve is a parasympathetic branch of the nervous system, and it runs from up and down from the brain into the digestion, and controls a lot of things related to your digestion.

You are not just what you eat. **You are what you digest and absorb.** People say 'you are what you eat.' You can be eating wonderful food, but if you are not digesting it properly, or you've got bad bugs in your gut that are fermenting it and turning it into toxins, or you have a leaky gut, or you're gluten intolerant so what you consider whole-grain bread is not handling well with you, or you have a food allergy, you are allergic to broccoli but are eating a lot of it because you know is good for you; it is not good for you. We have to be looking at not what people are eating but what they are digesting and absorbing.

**Your gut provides a protective barrier.** About 75% of your immune system is located right inside of your gut lining. That is a huge percentage but think about it. It makes sense because your gut is what is exposed to the outside in a way that is not as protected as your skin. Your skin is exposed to the outside, but it has a barrier that does not allow things to penetrate as easily. Your gut is intended for absorption and there is an open tube at the top and there is an open tube at the bottom. It is all the same tube and there is an opening there. It is easy for stuff to get in there that does not belong. That immune system is under surveillance. Whenever you are eating, your immune system is like that little cat waiting to stalk its prey or a tiger waiting to stalk. It's saying okay, we've got to watch out, something bad might be coming in. Is this self? Is this outside?



That stuff is called the GALT, the gut associated lymphoid tissue. What we will find when we discuss allergies a little bit later, is how the GALT, the gut associated lymphoid tissue, actually gets inflamed when you eat foods that you have a sensitivity to, or are exposed to allergens, and can cause your belly to bloat up three sizes bigger, all within a half hour.

The impact of the gut is body-wide, because when you eat and the gut gets the nutrients in, if you don't appropriately digest your food and absorb it, then your organs and glands are going to be starving. They are going to be missing something. If you've got a leaky gut and your gut is allowing toxins to get into the bloodstream, you are going to have symptoms throughout your body. You really need to be looking at the gut, and I would say look at it for everybody who walks in the door, even if the symptoms have nothing to do with digestion, just to make sure. It may be just little things that you can do to help them improve it, but you really do need to be looking at it.

Also, you want to understand, you want to be able to communicate with your clients' other providers, because chances are when people come to you they may be under the care of a medical doctor, or a naturopath, or an acupuncturist, but specifically the medical doctors who are maybe prescribing drugs for them, and you are thinking maybe there is another way. You want to be able to understand this well enough that you can actually talk to somebody and be understood, and have them understand you.

We are in a position as nutrition coaches to change lives in a big-scale way. People are getting more and more fed up with being in a health system that does not work, that is very expensive, that has a lot of side effects to the treatments, and is not as effective as it needs to be.

Lots of people are starting to look for alternatives. We have to be there and ready. We cannot be there and just say, just eat lots of fruits and vegetables. They can read that in the newspaper. While that is true that we need them to be eating more fruits and vegetables, there is a whole lot more that needs to be looked at, and to be done, and to be understood. I want you to be able to explain it on a level that your clients and patients understand, but also to be able to talk with the doctors if they say, would you talk to my doctor, or you may say, I would really love to talk to your doctor. It may take a little while before you get there, but you will get there.



### Digestion Influences Other Body Systems

How does your digestion influence other body systems? Number one is **nutritional deficiencies**. If you can't get the nutrients absorbed because of a faulty digestion you better believe that your heart is going to suffer, your pancreas is going to suffer, your thyroid is going to suffer, your reproductive function is going to suffer, because they are not getting fed.

When you have proper digestion you don't have **inflammation** in there. When you have inflammation in the digestive tract, it creates irritation to the lining of the tract, which affects absorption and affects that barrier, the immune barrier. Now instead of protecting the rest of your body from some of these toxins and large food particles that you have not fully absorbed, or antibody antigen complexes, you can't. That is going into your bloodstream and the whole rest of your body is under possible attack. You are not supposed to be able to **absorb toxins** through your digestive tract. They are supposed to be filtered and sent down. If your gut is not working properly you will be absorbing toxins. You better believe that those toxins are going to affect the whole rest of your body.

The other way that digestion affects other body systems is if you have a lot going on down there, you are having a lot of **immune stress**. What does that mean? It means that you are taking away some of your immune system's surveillance from other parts of your body where you need that protection. You may be getting some really weird stuff going on like autoimmune diseases, allergies, and inflammation in the joints, muscles, and bones. Yes, digestive problems influence **hormonal imbalances** in many ways, some of which we already talked about. One way in particular is by allowing some of those xeno-estrogens to be recycled and recycled and recycled and affect the way that your hormones are working.

Finally, **neurotransmitters**. You've got the gut/brain connection, and when your gut is not working properly your neurotransmitters are affected. There are serotonin receptors in your gut. If you are not absorbing your nutrients and you are not taking in the right B vitamins and amino acids, you better believe that that is going to affect your mood and your neurotransmitters.

### The Digestive Tract

Let's talk about the digestive tract. I am not going to stop and give you every little detail. I get that you have the overview. You have seen me present the mouth-to-the-anus model many times. That is the physical digestive tract.





We are going to talk a second about how the digestion just doesn't begin in the mouth and that there is an actual name for that phase of digestion. It is called the cephalic phase, which begins in your head. This is just a picture to show you everything in the digestive tract and we will go through each of these in detail. Your digestive tract's job is to take the nutrients from the food you eat so that the cells in your body can use them. That is its main job, and to protect you from the toxins in the food that you eat.

### 3 Main Functions Of The Digestive System

Let's talk about the three main functions of your digestive system.

One is **digestion**. What does digestion mean? It means the breakdown of food into molecules that the body can use. Digestion is broken into two parts. One is mechanical breakdown and the other is chemical breakdown. We all know where the mechanical breakdown happens. It starts in your mouth with the teeth, those molars crunching down that food. Then when it gets down into the stomach and passes into the duodenum, the majority of the chemical breakdown happens. A little bit of the chemical breakdown does happen in your mouth because you secrete an enzyme called salivary amylase, but most of that happens further down in the stomach and the duodenum.

The next phase is **absorption**. Once you have broken those molecules down into particles that the body can use, you need to be able to pass them through the small intestine into the bloodstream, so that they can be carried around through the body. I am going to show you exactly how that happens. When you understand how that happens, you are going to be able to understand what could be going wrong.

Finally, there is the **elimination** phase. That's the mouth-to-anus model. It goes in one way and comes out the other, but comes out looking quite different on the other end if you have done your job properly. The fiber that is not digestible passes through. Any toxic waste products, any chemicals, and anything in the bile that your liver has added on the way, as it is detoxifying your environment, is supposed to be eliminated. Any hormones that were used up that your liver said oh, we don't need this anymore, that eliminates the waste particles of those. Anything that needs to be eliminated is eliminated through your bowel, and that is the elimination phase. Those are the three main functions: digestion, absorption, and elimination.



### Assessing The Digestive Tract

Let's talk about assessing the digestive tract. There are a number of ways to do it. When people think of assessing parts of the body, they usually think about doing labs. Labs are good to do, but I don't jump into lab. Lab is one of my tools, it is just one. There are so many other tools that we can use, and we are going to use those tools as we go through the symptoms. We can list the **symptoms**. What are they healing? We could use online assessment scores, we could use paper and pencil questionnaires that we have them fill out. We can sit and interview them, I highly recommend that you use a paper and pen or online assessment tool because for you to ask all of the questions you need to ask who really get to know this person, it could take you an hour, two, or three depending on the person and how deep their history is and how much they go off on tangents, but if you keep them focused then you will know the questions to ask.

Those online assessments and written history forms, they do not take the place of the history, they certainly don't because you need to clarify that, you actually need to speak to the person and get their take on it, but it is a really great way to hone in and shorten your time.

Another way to assess the digestive tract is through something called **transit time**. We will talk a little bit more about transit time when we talk about the large intestine later on. Transit time is basically how long does it take you? How long is the bus route from mouth to anus? How long? Is it 30 hours, three days, two days? Is it 12 hours, 6 hours, 4 hours? Or is it right there in the middle between 18 and 20 hours where it should be? That tells us about the quality of your digestion. If it is too fast, you are not absorbing those nutrients. If it is too slow, you are not getting rid of the toxins fast enough. Your people will be having one or the other quite frequently when they come to see you because typically when they come to see you they are coming to see you because they are tired of being tired, they are tired of having digestive problems, they are tired of the doctor putting them on medication and they want to find the nutritional approach. You better believe that you want to assess their transit time, and we will talk about how to do that in the elimination phase and the large intestine phase.

The other piece is lab. You are going to want to look at **lab markers of malabsorption**. If you have done some other stuff first or if you get a person in who has been working with five other practitioners and still has not gotten results, you listen to what they have to say, they are eating a good diet, they are exercising, they are destressing, they are seemingly doing all the things that you think they should.





Maybe they have a gut critter that needs to be identified so we can put a very good attack in place to get rid of it, or maybe there is something else going on in their gut. That's what we would do, we would do markers of malabsorption, critters, parasites, candida, etc. There are also **physical signs of nutrient deficiencies due to malabsorption** and as we go through each section of the digestive tract I am going to remind you of these.

**Inflammation and allergic reactions.** If a person is constantly getting hives and it seems to be related to what they are eating, or even if it does not seem to be, that is a clue that there is something going on in their gut. If they are having inflammation and they are having allergic reactions they most likely have some imbalance in their gut. Maybe not 100%, but it is most likely the case, especially if they have eczema, psoriasis, or frequent skin rashes.

If they have some other stuff you really need to look outside. There are certain **symptoms outside** that we will talk about in each section **that relate to digestive tract**, skin, gums, nails, lips, tongue, joints, bones. Assessing the digestive tracts is not just asking how often they have a bowel movement, although that is an important question that you should be asking everyone that comes in the door. You are going to have to ask that embarrassing question and if you don't want to ask that question in person, you are going to write it on a questionnaire. How often do they have bowel movements? What do your bowel movements look like, what color are they? What is the consistency? We are going to have a chart later that you can compare the consistency to and understand what is going on. What is that consistency like? Are they long and skinny? Are they short and fat? Are they long and fat? Do they come out in one piece? All important questions and we will go through that in detail when we do our evaluation module as well but I will give you the beginnings here.

### 4 Stages Of Food Processing

We talked about the four stages of food processing earlier. We said the three parts of digestion were breaking the food down, absorbing it, and eliminating excess. This is adding the eating. **Ingestion** is eating. **Digestion** is using physical and chemical means to break down complex organic molecules into usable parts; and that is where your enzymes come into play. They take long strings of proteins and break them down into individual amino acids, long string of carbohydrates and break them down into individual sugars. Long strings of fat and break them down into individual fatty acids. The **absorption** is basically your pulling all of that across the membrane into the bloodstream. When you think about it, your mouth has a direct access to your bloodstream via your digestive tract.



So it is really important that I am really grateful that 75% of my immune system is going down there to protect me. Finally the **elimination** is the removal of wastes.

#### 4 Phases Of Digestion

Now we are going to talk about the phases of digestion. These are related to the particular body parts that are involved. Here is a picture from the top to bottom, but this does not show the **cephalic phase**: the brain phase. When you see, smell, or imagine seeing and smelling certain foods, it causes a reaction. Your body gets ready. It starts to secrete digestive juices. It starts to salivate and secrete salivary amylase in there. That is the cephalic phase. If by the time you are starting to eat you are in a fight/flight mode: you have just come from work, you're grabbing your food, you are eating it at a meeting, you are not even thinking about your food, you might as well not even eat it because what you are doing is you are putting yourself in a position where you are not going to digest your food much at all because everything shuts down when stress gets in the way and you have cortisol in your system. It closes down the sphincters that we will talk about. It decreases the salivation, decreases the enzymes, shuts down the ileo-cecal valve. That is the cephalic phase.

The next phase, **esophageal phase**, is a really brief phase and is about six seconds long. I am pointing to the esophagus, which is this tube that runs from the back of the mouth down into the stomach. We have a more detailed picture that I can show you how all of it works in a second. Your food goes into your mouth. You've got three sets of salivary glands, the parotid, the sublingual, and the submandibular. Those secrete digestive juices, saliva, into your mouth so that it moistens and begins the chemical breakdown. We've got the mouth and we've got the esophagus. The cephalic phase could be short or it could be a while. It could be you are making food, or you are sitting in another room and somebody is making food in another room, and it could be another 15 minutes before you get to eat. The esophageal phase is six seconds. The food goes from the mouth to the stomach in about six seconds.

The **gastric phase** could be 45 minutes, or half an hour for something really quick and easy. Say for example you have a piece of watermelon. Quick and easy and out of the stomach really quickly. But if you have a steak dinner with a baked potato and vegetables, that food could be in there from 2 to 4 hours. Fat stays there longer, proteins stay there a medium amount of time, and complex carbohydrates, and simple sugars are out of there really quickly. That is one of the reasons, if you have heard about food combining, don't mix fruit or sugars with other foods because the sugars digest really quickly and they need to get out or else they start to ferment.



Then we had the **intestinal phase**. That is the bulk of it. That is where it is mostly, it could be anywhere from 12 to 18 hours in the intestinal phase. This is the whole thing, we'll go through each of these in detail.

We already talked about the fact that there are two kinds of digestion, mechanical and chemical. Your food is ground into small pieces on the mechanical side, and then the large molecules are broken down into small molecules by the enzymes. It is really important to remember that because your teeth do most of the mechanical breakdown. Your stomach does a little bit more by churning and contracting. This is just your organs -- your mind, your mouth, your esophagus; your stomach, your small intestine; your liver, your gallbladder, your pancreas and large intestine.

We're going to go through all of these in detail so you understand the anatomy, which means the physical structure. Then we will look at the physiology, which is the function. Then we are going to look at the pathophysiology, which means when things are going wrong, how does it function? What kind of things can go wrong? Then we are going to look at how you do repair and how you do restore balance. Then we are going to be breaking it up.