

*Diet, Nutrition & Inflammatory Bowel Diseases:*

## **Understanding the Connection**

David T. Rubin, MD

Tracie Dalessandro, MS, RD, CDN

**March 10, 2009**

Operator: Hello, everyone, and welcome to today's free educational teleconference and webcast: *Diet, Nutrition and Inflammatory Bowel Diseases: Understanding the Connection*. It is my pleasure to introduce your moderator, Kimberly Frederick, Vice President of Patient and Professional Programs at the Crohn's & Colitis Foundation of America.

Ms. Frederick: Thank you. On behalf of the Crohn's & Colitis Foundation of America, I want to thank you for attending today's program: *Diet, Nutrition & Inflammatory Bowel Diseases: Understanding the Connection*. Today's program features two nationally recognized speakers: Dr. David T. Rubin from the University of Chicago Medical Center in Illinois and Tracie Dalessandro, a registered dietician specializing in inflammatory bowel diseases and best-selling book author.

Participation in today's program is available via the Internet and the telephone. I am thrilled to share that we have more than 2,500 individuals participating from across the United States and from 30 different countries around the world. However you are joining us today, we thank you for your participation and welcome all of you.

We also would like thank Shire for their generous support of today's program.

In just a moment, Dr. Rubin and Ms. Dalessandro will begin today's presentation that will highlight important information about diet, nutrition and inflammatory bowel diseases. We want to thank all of you who submitted questions in advance of the program. We received many outstanding questions and we have worked hard to address many of those content areas in today's program. We will have an interactive question-and-answer session after our two presenters speak. We will take as many questions as time allows from both the telephone and webcast participants. If we are not able to take your question, please feel free to call our Information Resource Center at 888-694-8872. The Information Resource Center accepts calls Monday through Friday from 9 AM to 5 PM Eastern Time.

And beginning this Wednesday, March 11, you will be able to view today's slide presentation synchronized with audio on the CCFA Web site. This synchronized presentation will be available for three months. In addition, a transcript of today's program, a copy of the program slides and audio file will be available on the CCFA website at [CCFA.org](http://CCFA.org). We encourage you

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Ms. Frederick: to share this information with your family members, your friends, your colleagues, who are not able to attend today's live teleconference and webcast.

And finally, we'd like to remind you to fill out the program evaluation form. For our teleconference audience, the program evaluation was enclosed in your registration packet. Please use the self-addressed postage-paid envelope to return your evaluation, or you can go to [www.RMEI.com/ccfaevaluation](http://www.RMEI.com/ccfaevaluation) to submit the evaluation online. For our webcast audience, you will see the evaluation link come up on your screen at the end of today's program. Your feedback is so important to us. We use these evaluation forms to help us develop future educational programs. In fact, it was through your suggestions in previous evaluations that we chose today's topic on diet and nutrition.

So now without further ado, I have the pleasure of introducing today's speakers, Dr. David T. Rubin and Tracie Dalessandro. Dr. Rubin is Associate Professor of Medicine, Co-Director of the Inflammatory Bowel Disease Center and Program Director of the Fellowship in Gastroenterology, Hepatology and Nutrition at the University of Chicago Medical Center. Ms. Dalessandro is a registered dietician specializing in inflammatory bowel diseases and author of the best-selling book *What to Eat with IBD: A Comprehensive Nutrition and Recipe Guide for Crohn's Disease and Ulcerative Colitis*.

Thank you again for being with us today. And now I will turn the program over to Dr. Rubin.

Dr. Rubin: Thank you, Kim. I want to welcome everyone today and I also want to take a moment to thank the Crohn's & Colitis Foundation of America for sponsoring these educational programs, making them available to all of you, and ask that you all consider joining the CCFA if you haven't done so already. It's through educational programs and support of research that we're together able to fight these diseases.

One of the most common questions that I face in my clinical practice, seeing patients with Crohn's disease and ulcerative colitis, has to do with what they can eat and whether or not diet and nutrition has had a significant role in the development of the inflammatory bowel condition, and specifically whether it's involved in causing relapses or what we sometimes call *flares*.

Today's objectives will try to address some of these commonly asked questions and obviously this very important topic.

By the time we conclude this presentation today, we're going to understand the importance of diet and nutrition in inflammatory bowel diseases, we'll review the effects of IBD on your digestion, we'll discuss various diets that have been popularized in the lay press and on the Internet, we will identify key elements of nutrition support therapy, and we're hoping to outline dietary strategies that are helpful in controlling IBD symptoms. We will review

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suggestions for your diet during a flare, we'll discuss what's new in alternative nutritional therapies and, very importantly, we'll do our best to answer as many of your questions as we are able.

So why is diet such a hot topic in the area of inflammatory bowel disease? The role of diet in the cause and control of IBD certainly makes sense. We've been told since we were young that you are what you eat. We also think that it's reasonable to consider that a disease that affects your GI (gastrointestinal) tract must be somehow related to what we put in our GI tract. And specifically that there must be a dietary contributor to the intestinal disease. In addition, when your gut is inflamed or diseased in any way, it certainly feels worse when food passes through it and therefore it's logical to think that food must be making the disease process itself worse.

One of the observations that inflammatory bowel disease in incidence and prevalence or the number of cases around the world is rising, may be explained by changes in the world's diet. So we think that this may be indirect evidence, that there is a dietary contributor to inflammatory bowel disease.

Diet and nutrition are important parts of IBD management. Diet is the actual food that you consume, it's what you eat. Nutrition refers to properly absorbing that food and staying healthy.

Incorporating good nutrition into your diet is actually quite important, as you know. When your bowel is inflamed and when your disease is active, it affects both your diet and your nutrition. And we want to separate those terms and understand how this affects you.

There's no evidence to date that diet can actually cause or cure inflammatory bowel disease. We have great interest in understanding this link. There's been lots of research that has been performed and there is ongoing critical work that's being done now. But it's important to understand that when we treat inflammatory bowel disease, we are trying to control an immune-mediated process that involves the gut, the immune system in our bodies and something in the environment. And when we talk about the environment, that certainly may be the food that we ingest, but it also may reflect the bacteria that live in our intestinal tract. And it's probably a combination of all of these factors that give individual people a specific type of inflammatory bowel disease.

We often hear the term *food allergy* mentioned. Patients ask, "Am I allergic to certain foods?" IBD is not related to a food allergy, but actually the symptoms of IBD may be worsened by food intolerances. A true allergy to specific foods is actually quite rare, where this is an immune reaction to the food akin to having a histamine release or even anaphylaxis. That is exceptionally rare. But we certainly appreciate that some people are intolerant to certain

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Dr. Rubin: foods, and specific foods may be things that those individuals should avoid. And we'll come back to that.

Your proper diet may improve the symptoms of IBD, and there's a difference between talking about symptom control and control of the disease process itself. We certainly want our patients to feel well and to have as few symptoms of active disease in their bowel as possible. But one of our goals is to control the disease process, so there isn't destruction of tissue and complications from the disease like surgeries.

We also know that when your bowel is inflamed, certain foods may help the bowel heal in conjunction with the natural process of the inflammatory condition and certainly in conjunction with effective medical therapies.

Patients with IBD are prone to becoming malnourished, and this is quite important to understand. First of all, people who have an inflamed gut or who have side effects from some of their medications may have nausea and a loss of appetite. They also may start attributing abdominal pain to the food that they eat and therefore they can develop what we sometimes call *food phobia*. This consciously or unconsciously leads our patients to avoid eating certain foods or avoid eating altogether.

In addition, when you have a chronic inflammatory disease, it tends to increase the caloric needs of your body. Sometimes we say this simply as the body is fighting itself and burning more calories.

Finally, poor digestion and absorption of nutrients, especially in Crohn's disease, can lead to malnutrition and weight loss. So when your gut is not working properly, it can affect your body's ability to handle the nutrients that you so desperately need for good health.

Now in order to maintain good nutrition, you have to do a number of things. It has to do, number one, with having effective and safe therapies to control the disease process. Number two, to allow your good nutrition to aid in healing and promote a healthy immune response and immune system, so your energy levels are restored to normal. And thirdly, we want good nutrition to help prevent or minimize your ongoing GI symptoms and normalize your bowel function.

I can't emphasize enough to all the listeners that our goal for managing inflammatory bowel disease is to achieve an unrestricted quality of life. That should not mean avoiding lots of different types of foods. It should not mean living with active symptoms or daily pain. It certainly should not mean looking for a restroom every time you go out or planning your social functions around whether or not you're going to have easy access to a bathroom. What we want for our patients, and thankfully what we're able to achieve for most people—

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and we're pleased with the progress we've been able to make—is control of the disease and an improved quality of life. And all of this works together to achieve that.

Now, poor nutrition or malnutrition can have lots of important and sometimes irreversible effects on our patients and on all of you. Lost nutrients may actually cause growth effects in children and teenagers. In fact, one of the most common ways children present with inflammatory bowel disease is not with typical symptoms of diarrhea and abdominal pain, but rather they will present with a failure to grow or what we sometimes say is a failure to thrive or delayed puberty. And those should be signs that we need to be looking for something going on in the gut that's impairing nutrition, impairing absorption of a key nutrient, and leading to that important effect on their growth and development.

In addition, weight loss in women and girls may certainly impact on hormone levels, and they often will have irregular menses or delayed menstruation.

When we talk about digestion, what we actually mean is this is the active process by which what you put in your mouth is converted to substances that can be absorbed by the body and stored for future use or broken down for immediate energy. Most of the absorption of nutrients occurs in our small intestine. And the large intestine primarily we think of as being a recycling organ or an organ of convenience.

Your large intestine actually is filled with bacteria. There's more bacteria in your large intestine than there are cells in your entire body. And what we've come to appreciate is that the large intestine has a role of recycling our fluids, so that we don't become dehydrated, and packaging our waste for convenient elimination. So you can understand if people have inflammation of the small intestine, it may affect their ability to absorb nutrients. And if they have inflammation of their large intestine, it affects their ability to package waste and have a convenient elimination.

So we could take a careful history and know what symptoms a patient has and actually start to figure out where the disease is before we even do any other diagnostic tests.

Let's talk for a minute about the difference between Crohn's disease and ulcerative colitis. We consider these to be sister diseases. That means that they're similar, but they have some important differences.

Crohn's disease may affect any part of your intestinal tract, from the mouth all the way down to the anus. The inflammation in the Crohn's disease is most commonly in the small bowel, but it's very important to know that 25% of Crohn's patients will have disease that's only in the large intestine, and it can sometimes be thought to be ulcerative colitis during the early time of diagnosis.

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Crohn's disease also causes full-thickness inflammation of the intestine and because of that, patients with Crohn's disease can develop obstructions of the bowel or what are called fistulas, which are abnormal connections between hollow loops of bowel or loops of bowel in the skin.

Ulcerative colitis works just in the large intestine and is more of a superficial inflammation. It's important to know that when your rectum is inflamed or when the large intestine is inflamed, it gives you symptoms primarily of urgency and some diarrhea with blood, and doesn't cause the same types of problems that Crohn's does.

So knowing what we've talked about with digestion, you understand that if you have a significant part of your small intestine that's diseased with Crohn's, it'll affect your ability to absorb key nutrients.

So there are a few nutrients and important measures that we use when we see patients in the office and things that we should all be thinking about. Patients who have decreased absorption in their bowel or who have chronic blood loss can become iron deficient. This is an important component of our blood count, and therefore they can become anemic. Patients with significant ileal disease, disease of the small bowel, or who've had resections of the small bowel, can become vitamin B<sub>12</sub> deficient. And patients who've had intestinal surgery, but even patients who haven't had surgery but have Crohn's disease, have been found to often be vitamin D deficient, which is critical for a number of factors in our bodies, especially bone health. And lastly, zinc deficiency is often found in our patients with chronic intestinal diseases. This can lead to chronic diarrhea and it can also affect your body's ability to heal.

So is there a special diet for patients with inflammatory bowel disease? Well, there are certainly diets that have been advertised for our patients with IBD and I bet many who are listening now have seen this or even tried them. There are many claims on the Internet and in publications that are supported by a small number of subjects who share their stories of success. And while we're always pleased to see success in our patients with IBD, it's important for everyone to acknowledge the difference between symptom control and disease control, as well as to acknowledge the importance for good research to help us understand who will best benefit from these approaches to our management of the disease.

I encourage my patients to talk to their doctors, to work with nutritionists and to be very open-minded to a variety of approaches and to seek a physician and a healthcare team that will work with them to address their concerns.

So let me go through some of the diets that you may have seen and tell you what they mean and what they are and a little bit about what we know.

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Starting with an elimination diet. So this used to be proposed as a common approach to managing inflammatory bowel disease. It involves trying to identify specific foods that when challenged to an individual patient, cause problems every time. So it's not just once in a while, it would be something that is clearly a food that you're intolerant to.

An example might be dairy-containing products. Many people who don't even have IBD are certainly lactose-intolerant. But patients who have inflammation of their small bowel may be even more lactose-intolerant, so we want to appreciate whether there are specific foods that we can easily address and eliminate.

On the other hand, we don't want people eliminating everything they eat. That's the sign that their bowel is inflamed, it's actively diseased and we need to get their disease under better control. Elimination diets should and must be done in conjunction with a dietician, a nutritionist and, of course, your healthcare providers, your doctors and your nurses.

A low-fiber and low-residue diet is something that Tracie will talk more about as well. This minimizes the intake of foods that add bulk residue to your stool and these are sometimes used for people who have active flares and certainly for people who have narrowings in their bowel. Remember your intestinal tract is a long tube and sometimes it's just a matter of plumbing, eliminating the bulky foods can reduce some of the symptoms you have from having partial obstructions or narrowings in the bowel that lead to other symptoms.

Moving on to a few others that you might see on the Internet, and I'm not endorsing any of these, I do want you to know about them, though, because I think it's important we discuss them.

There's one called the *Colitis 5-Step Formula*, which claims that it uses a, quote, natural pathogen to eliminate infection, along with diet and physical activity to put the digestive system back in order. There have been no controlled trials that demonstrate that this controls the disease process and I would caution you about endorsing something that uses terms like a "natural pathogen killer" to eliminate infections that are not otherwise specified.

The *Specific Carbohydrate Diet*, very widely discussed on the Internet and in publications. The concept here is reducing poorly digestible carbohydrates to lessen the symptoms of gas, cramps and diarrhea. It consists mainly of meats, vegetables, oils and honey, and the idea here might be related to starving some of the bacteria in the gut. If we only knew which bacteria in our gut needed to be starved or how to better do this, so that we could end up with controlled state of remission for the disease, we would be very happy to continue endorsing additional therapies like this. We don't have that evidence yet, so I caution you in embracing this until we know a little bit more. There is ongoing research in support of this concept.

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The *Maker's Diet* focuses on four components of total health. Physical, mental, spiritual and emotional. Well, that's great, we're very supportive of that idea. Just caution you to be careful not to ignore other therapies that are effective for controlling the disease process if you need them.

Two other approaches that have been well described and we sometimes use in our management of our patients. *Total bowel rest* means complete bowel rest, during which the patients are nourished with fluids that are delivered intravenously. We know that when we rest the bowel it certainly eliminates many of the symptoms our patients feel. Unfortunately, putting patients at total bowel rest is not a sustainable condition for disease control. As soon as food is reentered into the diet, the patients end up with resumption of their disease process, if we haven't instituted a surgical or medical therapy to control the condition.

An *elemental diet* is a diet that primarily limits carbohydrate intake. It reduces microbes that might be contributing to the disease process. It works well in children. It's not a very tasty diet at all. In fact, it's rather impalatable. But again like the diet where there's total bowel rest, not something that's sustainable and therefore it's hard to support the concept of an unrestricted quality of life, when we're faced with these diets that certainly limit us in many, many ways.

So moving on, our key message about diet that I hope you're coming to understand—diet has not been proven to prevent the onset of IBD and unfortunately has not been proven to provide sustainable disease control. And what are the outcomes we want to change when we're managing inflammatory bowel disease? We want to avoid surgery, we want to avoid needing corticosteroids if we can, we want to avoid needing hospitalization and we absolutely want our patients living high-quality lives.

So we do know that diet can help with symptom control while your disease is being treated. There are recommendations and the recommendations for dietary management that go along with your medical or surgical treatment for your inflammatory bowel disease are individualized; depends where your disease is. It depends on what your current state is, whether you're in remission or whether you're actually relapsing. And so we have to keep all of these things in mind when we make recommendations to control the disease.

So our key message is that number one, I think individual experience does guide food selection. I think understanding which foods always make you worse is a key part of understanding your disease. And discussing with your healthcare team is critical, so that you stay well-nourished during that time. You want a well-balanced healthy diet and you want to make sure you're staying hydrated and that you're able to enjoy your life and enjoy the things that you want to do in life without significant limitations. That is, after all, our goal for managing inflammatory bowel disease.

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Dr. Rubin: So when we need to support people who can't stay nourished because of their disease or present to us with significant disease and have become malnourished, we often have to address this with additional supplementation. So if patients are having weight loss, if they're having difficulty taking in food orally, if they've had significant surgery, which is becoming less commonly needed but is still important, or if they have bowel obstruction or severe inflammation, where they can't keep up, there's a variety of things we do.

We recommend liquid nutritional supplements. Many of these are available easily over the counter. And we also sometimes supplement with enteral nutrition, which means using a nasogastric tube, which is a tube that goes through your nose into the stomach, or a tube that may even go from your nose all the way into the middle portion of your small bowel. We can deliver healthy, well-balanced nutrients that way. It's obviously not the way we want people to go living their lives, though, so these are usually supplementals and bridges towards more disease control.

And lastly is the concept of *parenteral nutrition*. So when we use total bowel rest or when patients have had substantial surgery and have led to a small bowel that is too short for adequate nutrition and hydration, some patients need to have chronic IV (intravenous) nutrition and hydration. Fortunately, this is rare now, but when we use it, it is successful, it can provide patients with the mobility and the quality of life they need, and it does provide them with disease control from their inflammatory bowel.

Thank you for your attention today and I look forward to your questions after Tracie's presentation.

Ms. Dalessandro: Thank you so much, Dr. Rubin. And I'd like to say hello to everyone who has joined us today for this great event. I'm really thrilled to be here to discuss the dietary management of IBD: how to eat and what to eat when you have inflammatory bowel disease.

So I'd like to begin by discussing some strategies to control inflammatory bowel disease symptoms.

There are several strategies that exist to control IBD symptoms and potentially help to put the disease into remission. The most simple strategy involves avoiding your trigger foods or foods that have caused you problems in the past or that have caused a flare of your disease. It is important to realize that not all IBD patients are affected by the same foods.

So below are the list of foods that commonly cause GI discomfort. These include high-fiber foods, such as nuts, raw vegetables or leafy greens; high-fat foods, such as greasy or fried foods; caffeine-containing products, such as coffee, tea, soda and chocolate. Alcohol, which can be irritating to the gut. Dairy foods or foods that contain lactose. And of course, spicy foods. They can all be irritating to an inflamed gut.

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Ms. Dalessandro: The second strategy ensures that you have adequate and appropriate intake of calories and nutrients through the consumption of fluids, carbohydrates, proteins, fats and fruits and vegetables. It is very important that you consume a well-rounded diet that includes all of these food groups. Doing so ensures that you are getting sufficient calories to promote healing and maintain nutritional status.

Without the appropriate intake from all food groups, you can become very malnourished and weak, especially in Crohn's disease.

Let's discuss further how we can get enough calories and nutrients from the different foods and fluids that we're choosing.

To begin with, food intake is very important in IBD patients, a condition where chronic diarrhea is common, and the risk of dehydration always exists. Furthermore, dehydration and salt loss can create a feeling of weakness. For these reasons people with IBD should consume ample fluids of about 8 to 10 glasses per day. That is what is recommended, especially in warm weather, when the loss of salt and water through the skin may be very high. Water is the best source of hydration. However, when diarrhea is severe, diluted sports drinks are acceptable.

Moving on to carbohydrates. Carbohydrates as grains or complex carbohydrates are also a very important part of caloric intake. Common examples of carbohydrates include bread, rice, pasta, crackers and cereal. Carbohydrates are a good source of energy. However, they are generally low in vitamins and minerals unless they are fortified. Many patients with IBD tend to make carbohydrates an excess part of the diet due to the belief that they are safe to eat or cause little GI discomfort. Well, this may be true of many refined carbohydrates; however, you should remember that it is very important to overall health that you consume a diet that includes all food groups. Carbohydrate grains should be about 50% of your diet, not 90%.

Protein is the next critical nutrient that we must ensure we get enough of. About 25 to 30% of our diet should consist of a lean protein source like meat, fish, eggs, smooth nut butters, poultry and soy. Protein is very important for growth and development as well as proper immune function and healing in general.

Moving on to fats. Fats are a good source of energy because you can obtain a lot of calories from a small portion. This is especially beneficial if you need to increase the caloric content of your diet or you need to gain weight. Healthy fats should comprise about 25% of our diet. So examples of healthy fats include omega-3 fatty acids, such as flaxseed oil and oils in fish, and monounsaturated fats like olive oil and canola oil. You should try to eat fish at least two times a week. And remember not to cook with flaxseed oil, as it degrades very easily.

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Ms. Dalessandro: Fats to avoid or limit the consumption of are unhealthy fats, such as butter, lard, margarine or trans fats, high fat meats and fried foods. High-fat foods can contribute to malabsorption, especially in patients who have Crohn's disease in the small intestine.

Moving on to my favorite topic, which is fruits and vegetables. This is a major food group that should never be overlooked. Five to nine servings of fruits and vegetables should be consumed every day. Remember, they are our body's main source of vitamins and minerals, especially vitamins A and C as well as several other vital nutrients. Deeply colored fruits and vegetables contain the most nutrients.

Vegetables can be broken down into well-tolerated, which would mean cooked without skin and without seeds. Examples include butternut squash, carrots, asparagus, spinach and sweet potato. And poorly tolerated, which would mean raw, with skin or with seeds. These include eggplant, cabbage, string beans, celery, cucumber, garlic and onion.

Now you can definitely cook with garlic and onion for flavor, but then make sure you remove it before eating that particular food.

So I'd like to now discuss diet during a flare. During periods of disease flares, eating may prompt abdominal discomfort and cramping. Here are some ways to help reduce these symptoms.

Follow a low-residue diet to relieve abdominal pain and diarrhea, and I will be discussing this diet in more detail on the next slide. Avoid foods that may increase stool output, such as raw fruits and vegetables, prunes and caffeine. Eat smaller and more frequent meals, and always consider a nutritional supplement if your appetite is poor. Nutritional supplements may include high-protein shakes, especially when food is not desirable. And I know that many IBD patients have appetite loss and sometimes a protein shake really does the trick.

A low-residue diet may be recommended during a flare. A low-residue diet minimizes the intake of foods that add scrapey residue to the stool such as raw fruits, vegetables, seeds and nuts. This diet is often followed during periods of disease flares and may consist of grains that are more refined such as plain cereals, white rice and refined pastas, avoiding whole grains. Fruits like fruit juices, applesauce and bananas, avoiding prune juice since it may increase diarrhea. Vegetables that are well-cooked and potatoes without skin. Well-cooked meat and protein, avoiding beans, nuts and seeds. Dairy products can be taken in as tolerated, and remember that some IBD patients are lactose-intolerant and some are not. This is when you need to use your individual experience with foods to guide your food selection. Alternate sources of calcium include fortified soy milk, fortified juices and yogurt.

In addition to specific recommendations about the various food groups, there are some general principles of food selection that may guide you in making appropriate choices for a healthy and well-balanced diet.

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Ms. Dalessandro: First of all, choose carbohydrates with more soluble fiber than insoluble fiber, avoiding skins, nuts, seeds and popcorn. Consider adding protein to your meals, especially lunch and dinner. Eggs, lean meats and smooth nut butters are great sources of protein. Use healthy fats such as olive oil and canola oil for meal preparation. Cook with deeply colored fruits and vegetables, as these are highest in nutrients. And make sure you consume foods that are high in vitamins and minerals, giving purpose to your meals by carefully planning on eating foods that are high in nutrients and low in fat and sugar.

I'm going to be discussing now some vitamin and mineral supplements. For most people with IBD, it is worthwhile to take a multivitamin preparation on a regular basis. Other supplements may be necessary, depending upon the extent and location of disease. B<sub>12</sub> is absorbed in the lower ileum, so that people who have Crohn's ileitis or Crohn's disease that affects the ileum or those who have undergone small bowel surgery may have a vitamin B<sub>12</sub> deficiency because they are unable to absorb enough of this vitamin from their diet or from oral supplements. To correct this deficiency, a monthly intramuscular injection of B<sub>12</sub> may be required.

In terms of calcium, people with IBD may have limited intake because they avoid dairy products due to lactose intolerance or because they believe they are lactose-intolerant. Patients should always aim for at least 1,500 milligrams of calcium daily, either in dietary form or as a supplement, taken in three divided doses during the day. And you should note that the most absorbable form of calcium is calcium citrate.

Affecting almost 70% of people, vitamin D deficiency is one of the most common nutritional deficiencies seen in association with Crohn's disease. If you suffer from malabsorption or have undergone intestinal surgery, vitamin D may be required. Vitamin D is essential for good bone formation and for the metabolism of calcium. Supplementation should be in the range of about 800 international units per day, especially in the nonsunny areas of the country, and particularly for those with active disease.

Folic acid deficiency is also quite common in patients with IBD, especially if you are on the drug sulfasalazine. Most patients should take a folate tablet of about 1 milligram daily.

So what's new with IBD? There has been an increasing amount of interest in the use of alternative or complementary medications for various disease states. *Probiotics* are defined as good bacteria that restore balance to the enteric microflora in the intestines. The rationale for the use of these agents derives from the fact that different bacterial species have variable effects on intestinal inflammation in IBD and that some bacteria seem to have relatively beneficial effects in maintaining remission. Probiotics do help to restore the balance of bacteria in the gut, which is especially important for IBD patients.

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Ms. Dalessandro: Fish oil supplements are another alternative therapy. It has been suggested that omega-3 fatty acids may help reduce the pain and inflammation associated with IBD when added to standard therapies. Omega-3 fatty acids can be found in fish, fish oil, flaxseed oil and dietary supplements.

Continuing our discussion about what's new, short-chain fatty acids are always a question. Dietary carbohydrates are broken down into short-chain fatty acids by bacteria in the large intestine. Several trials of patients with UC have found that using an enema to boost the amount of short-chain fatty acid in the large intestine decreases disease symptoms and increases the efficacy of medication. The evidence is conflicting to date; therefore, additional studies are needed.

Another product that is being promoted for IBD is a natural aloe supplement. It may work gently with the intestinal tract to help break down impacted food residues and thoroughly cleanse the bowel.

It is important to recognize that none of these therapies should replace the use of medications prescribed by a physician until more information becomes available.

So in discussing key points, we have clearly established that together, diet and nutrition play an important role in the overall management of IBD. Knowing how to eat is equally as important as knowing what to eat. Patients with IBD should strive for a well-balanced healthy diet, taking into account personal experience with trigger foods and with careful consideration to include several food groups whenever possible.

On a more personal note, as a patient myself, I know it is sometimes hard trying to manage this disease. What you need to remember is that diet can help you control your symptoms, renourish your body and allow your bowel to rest. Medication can help your body heal. And faith and healing will facilitate your recovery.

I would like to thank everyone for listening today and turn things back over to Kim for the question-and-answer portion of the program.

Ms. Frederick: Thank you, Ms. Dalessandro, and thank you, Dr. Rubin, for that rich and thoughtful presentation.

We will now begin the question-and-answer session. We know that a lot of you have questions, so we are going to do our best to address as many questions as possible. To help us, we will limit questions to one per person and ask that your questions be general in nature and not specific to your individual case.

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Ms. Frederick: So if you are joining us by phone, you can participate in the question-and-answer session by pressing star-1 on your keypad, that's star-1. If you are joining us by web, simply click on Ask a Question, type your question in, and then hit Submit.

Again, let's keep our questions general in nature, and if your question is not answered, please call our Information Resource Center after the call at 888-694-8872. Operator, will you please give instructions to the telephone audience?

Operator: To participate in the call by asking a question, please press star-1 on your keypad. We will take questions in the order they are asked. Please be aware that due to time constraints, we can only take one question per person. Once your initial question has been asked, the operator will transfer you back into the audience line.

Ms. Frederick: Okay, I'm going to take a web question. And this one was submitted by Michele Goldstein and I'm going to give this to Ms. Dalessandro. How important is limiting sugar to the diet?

Ms. Dalessandro: My feeling about sugar is that it is very important to limit sugar because what happens is certain bacterias and yeast will thrive on sugar in the intestine, and these are not always beneficial things that you want to happen. Also when you take in a lot of sugar—some IBD patients take antibiotics on a regular basis—and when that happens, it causes a dysbiosis or imbalance of bacteria in the gut, and sugar will just add to that. And it'll add to the risk of getting yeast infections. So I never advocate having a high-sugar diet. And I think keeping it as minimum as you can would be the best decision.

Ms. Frederick: Thank you. We can take a question from our telephone audience.

Operator: Our first question comes from Leslie from Maryland.

Leslie: I know you touched on the sugar and I know you want general questions, but I'm just curious, and this can be answered by you or the doctor himself. I have a dual diagnosis of ulcerative colitis and diabetes, and I'm wondering, you did say something about the sugar and limiting that, but how many people are generally affected like myself? I have family members affected that like, too, with the dual diagnosis. And second, what can help us to be healthier?

Ms. Frederick: I'm going to start off with Dr. Rubin if you want to start, about how common it is, with UC and diabetes. And the second part, either of you.

Dr. Rubin: Thanks for calling in, Leslie. What we understand about inflammatory bowel disease is actually similar to what we've come to understand about diabetes. They are both what we call *complex genetic disorders*, and that means that there is a genetic component and something in the environment that triggers the disease. So it doesn't mean that there's shared components between these two conditions, it is not common for people with ulcerative colitis to also have diabetes, but they definitely can coexist in the same individuals or as

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- Dr. Rubin: you said, in your family, within a family. It's hard to know if you have some underlying gene that has led to both conditions, but it certainly is true that monitoring the control of one might help you control the other in terms of your dietary intake. We should emphasize, though, that to control the diabetes, just like watching your sugars, is part of what you need to do. Same thing with ulcerative colitis, monitoring what you take in and what you eat to control some of the symptoms, has not been shown to be a substitute for maintaining good disease control. Tracie?
- Ms. Dalessandro: So the second portion of your question was about taking in sugar. What's important about having diabetes and inflammatory bowel disease is that some of the dietary issues that you'd be facing in diabetes would be similar with inflammatory bowel disease. So with inflammatory bowel disease and with diabetes you always want to have a diet that's higher in soluble fiber, because soluble fiber is very beneficial in managing blood glucose levels and also in slowing the contents of the bowel. So it's beneficial for both conditions. Also keeping your diet low in sugar is beneficial for both conditions, as I stated earlier, and we understand the reasons why it's important in IBD and obviously it's important in diabetes because of the insulin response that sugar elicits.
- Ms. Frederick: Thank you. I have the next question and it's from our web audience. It's from Darryl McCant and he asks, how can I be tested to see if I have enough vitamins and minerals? And I'm going to give that to Dr. Rubin.
- Dr. Rubin: Darryl, you need to discuss with your doctor. Sometimes there's so much to cover during a brief clinic visit that you don't have time to address all these things. So just a general recommendation for everyone who's listening, create a list of your questions and concerns before you get to the doctor's office. Whenever possible, bring a family member with you who can help nudge you along and remind you of things that you want to know. And these are mostly blood tests that we can do. Obviously when there's the downstream effect of malnutrition or vitamin deficiencies, there may be other tests that are indicated. But almost everything we talked about today is a simple blood test that can be done routinely. You may have already had it, so talk to your doctor, ask if I've had this done, and if you haven't had it, make sure you get these things done.
- Ms. Frederick: Great. We'll take a telephone audience question now.
- Operator: The next question comes from John from Georgia.
- John: This question is for Dr. Rubin. Dr. Rubin, I just had a question regarding diet and nutrition for Crohn's. There's been someone who's been telling me that there's a possibility that *Mycobacterium avium paratuberculosis* might be related to some form of dairy reaction with Crohn's disease. Where does that stand as far as research right now?

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Dr. Rubin: Thanks for that question, John. That's a common question and it's an important topic. What we'd love to identify would be a single organism or specific infection that explains inflammatory bowel disease or even for that matter, a component of inflammatory bowel disease in some people. There's been interest in a specific organism called *Mycobacterium*, as you mentioned, and a specific type of mycobacterium. The reason has spurred a lot of interest and some research has been because it causes a disease in cattle that can look like Crohn's disease in those animals. So people have said well, this looks similar in the animals, maybe we can find it in humans. So there's been some work done and in fact, they even did a trial where they said, let's treat some patients with Crohn's with the antibacterial therapies that we use to treat this *Mycobacterium*. And unfortunately, that did not resolve the disease. It certainly didn't cure it.

The question about dairy is a slightly different one. It may be because of the cattle relationship I mentioned to you briefly, but it might also be because some people have previously said that when we actually pasteurize milk, there are some organisms that are not successfully eliminated and those might be driving IBD. That has not been proven yet and so there's interest in these things, there's definitely ongoing work going on, but I would have to emphasize to you that in the best trials that have been done so far, this doesn't explain the majority of what we're seeing in humans. Definitely ask your doctor about it, though, and keep your eyes and ears to the ground about this because we're looking and we're working and want to find better explanations for what we're doing with these diseases.

Ms. Frederick: Great. I'll take the next question from the web, and this one is for Ms. Dalessandro, and it's from Terry Knotts. Should someone with ulcerative colitis stay away from things like popcorn, seeds and nuts due to possible irritation of the colon?

Ms. Dalessandro: Hi, Terry, thanks for the question. Absolutely, especially when your disease is in a flare or you have strictures or narrowing in the GI tract, you want to stay away from popcorn, seeds, nuts or anything that can really scrape the bowel. And those are very high in insoluble fiber and I would definitely recommend staying away from those kinds of foods.

Ms. Frederick: Great. We'll take a question from our telephone audience now.

Operator: The next question comes from Joseph from Florida.

Joseph: I was wondering what diet would be better as far as the foods we take, one that is more alkaline or one that is more acidic?

Ms. Frederick: Dr. Rubin or Tracie?

Ms. Dalessandro: That's a difficult question. Most people would recommend a diet that's more alkaline; however, it depends on your system, where disease is located, the extent of the disease

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Ms. Dalessandro: and that's a little bit more of a general question and it is more individualized, so a little harder to answer.

Dr. Rubin: I can add to that a little bit. So first of all, when you take in an alkaline diet, it doesn't necessarily change the way your body ends up handling everything. Remember that your stomach makes gastric acid. Acid will immediately neutralize whatever alkaline components you take in. Your pancreas and your liver produce things that neutralize the gastric acid as it leaves the stomach, and so if you took in more acidic foods, you might actually end up having those neutralized as soon as they enter the bowel. So the important thing to understand is that our human bodies are really remarkable at restoring homeostasis and neutrality, no matter what we tend to put in. So there hasn't been any evidence yet that any specific diet, whether it's more acidic or more alkaline, number one, controls your disease, which of course is what we want, and number two, that it actually stays that way when it gets down into your gut and it starts to be digested. So I wouldn't pursue that too aggressively.

The last thing I'll mention is that some of these things that you take in can actually impair your body's ability to absorb your medication. So you've got to be careful when you take anything like that, that you separate your medicines from some other component of your food or diet that you're mixing.

Ms. Frederick: Okay, we'll take a web question now by Helene Cardell. Her question is, how can you help a child with Crohn's catch up in terms of their growth and maturity? My 18-year-old daughter barely reached 5 feet and she just started her period this year. These maturity issues were more difficult to deal with than her actual Crohn's disease. Dr. Rubin?

Dr. Rubin: I appreciate the question. This is a critical issue and I definitely understand what you're asking. The social implications of having IBD, both from its ability to affect the way you interact with people, but especially in young children, how it affects growth and development and then how that impairs social functioning, is a very important issue that we have to deal with.

The first thing I'll say is it's extremely important that the disease be under control. So despite the fact that her chronological age is 18, it may be true that since she just got her period, that her growth plates aren't fused yet, and I'm hopeful that you've already seen a pediatric endocrinologist who's obtained x-rays to see whether the bones are fully grown yet or not and whether there might be a role for either some hormone therapy or what we prefer when there's enough time, is effective treatment of the IBD. So when you control inflammatory bowel disease, children catch up in their growth and development very rapidly.

The second thing that I must emphasize is the importance of support groups and the importance of age-appropriate support networks. So the Crohn's & Colitis Foundation of America offers these and there a number of other organizations that may offer support for

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Dr. Rubin: your daughter as well. And I would strongly encourage her to connect with other teenagers who have shared similar experiences and through that she can often develop the type of support she needs with peers who've experienced this disease, and it'll help her cope as she moves forward through her life.

Ms. Frederick: Great. We'll take from our phone audience next.

Operator: The next question comes from Rachel from Connecticut.

Rachel: Hi, my name is Rachel, and I was just curious, this may be more generalized, but as far as women who are wanting to become pregnant, what is the best route for them? I know there's all sorts—there's not enough information as far as drugs, what you can be on, but exploring nutrition and probiotics, what is your recommendation for that?

Dr. Rubin: Rachel, excellent question, very commonly asked, and if it's not asked at the time someone is planning their family, it's often asked even when they're young and when they're just diagnosed with the disease.

What we've come to appreciate about pregnancy and fertility and inflammatory bowel disease is that the health of the mother is the most important variable that predicts pregnancy outcomes and the fertility of that individual woman. So what we emphasize is that the disease must be under good control, and if you are in remission at the time you are trying to get pregnant, the fertility or fecundity ratio—meaning how easily you can get pregnant and carry a pregnancy to term—is the same as the general population. So having said that, we actually do know quite a bit about our medications for Crohn's disease and ulcerative colitis, and we think that many of them are completely safe during pregnancy, and we advise that, and I would encourage you to talk to your gastroenterologist and an informed obstetrician about these options. Because the alternative to being off medication for the time that it takes to get pregnant, the whole time during the pregnancy, during which you'd be at a higher risk of relapsing, and the time immediately after the pregnancy when you have hormonal shift and you certainly want to be healthy and home with the new baby, is too long to be off of all therapy. So this is a really critical issue.

There have not been any studies that have documented the ability of probiotics in Crohn's or ulcerative colitis to maintain remission in the absence of other therapies. So I can't endorse that for someone who has active Crohn's or UC and is trying to get pregnant and start their family.

Ms. Frederick: Okay, we'll take another telephone question from the audience.

Operator: The next question comes from Yvonne from Alabama.

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- Yvonne: Some of the forms of food like milk or eggs, if prepared one way, they don't bother you. If you prepare them another way, they bother you. What is the connection there?
- Ms. Frederick: I'll give this to Ms. Dalessandro.
- Ms. Dalessandro: Hi, Yvonne. In terms of preparing milk and eggs, if you're preparing eggs, let's say in a frying pan with a lot of grease and you tend to have malabsorption of your Crohn's disease in the small intestine, that may be the reason why you're seeing a difference, versus boiling an egg or having a hard-boiled egg. Can you be more descriptive in terms of the problems you're having with milk? Because obviously you may have a lactose intolerance. But that would be with fluid milk. Sometimes if you have a lactose intolerance, you can't tolerate fluid milk, but certainly you can tolerate hard cheeses or yogurt, which is fermented, and things of that nature. So does that answer your question?
- Ms. Frederick: I think we closed out on her. But thank you, that was pretty thorough of an answer, thank you. We'll take another telephone question from the audience.
- Operator: The next question comes from Paula from Idaho.
- Paula: Hi, my question was, are the diet recommendations for ulcerative colitis the same or similar for proctitis? Are there important differences other than the pattern of inflammation in the lower large intestine and the upper large intestine, different in those two diseases?
- Dr. Rubin: Paula, that's an excellent question. So does the extent of the disease, whether it's Crohn's or ulcerative colitis, impact on dietary recommendations? And the short answer is "no." You want a healthy diet, you want one that your body tolerates and that is working together with the disease control, to allow proper absorption.
- But I'll answer a little bit more thoroughly. People who have distal ulcerative colitis, which means just the rectum is involved, in proctitis, as you said, or the lower part of the large intestine is involved, sometimes those individuals suffer from more constipation. And the reason for that is because the lower bowel, when it's inflamed, doesn't squeeze and move things very well, so you end up with food and digested products backed up a little bit on you. So when people are feeling that, we sometimes encourage additional fiber, opposite of what we've talked about today, to help encourage things move through. And obviously we also encourage them to have their disease under good control, to help things move through. But there's no necessary disease-control benefit to specific diets related to the existence of proctitis versus involvement of the entire colon.
- Ms. Frederick: Okay, and I have a web question and the question is from Lisa R. Isn't a folate deficiency or vitamin B deficiency quite common with IBD patients?

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**Dr. Rubin:** Sometimes patients with IBD can have folate depletion, and as you heard Tracie mention, patients who are taking sulfasalazine are encouraged to take folate acid. People who are taking an immune-suppressant therapy known as methotrexate, take folic acid supplements. You can develop a folate increase in your blood if you have too much bacteria in your small bowel. So sometimes when you have excessive bacteria growing in the bowel, because you have narrowing in your bowel or you've had surgery before, bacteria, when they digest carbohydrates and the nutrition that we put in our intestine, they actually make folic acid and folate. So it can actually be the opposite.

Obviously a physician who knows your anatomy and who checks you for these different things and looks for some of the byproducts of deficiencies is critical to understanding what your individual situation is.

**Ms. Frederick:** Okay, I have another web question from Rebecca. Are the live, active yogurt cultures in baby foods considered helpful, especially during a flare-up? Tracie?

**Ms. Dalessandro:** I believe that probiotics are helpful in general for IBD patients and the general population. I think it's just healthy to replace those bacteria. They can help block pathogenic bacteria in the gut, they can assist the immune system and block harmful pathogens, fight against food-borne illness, and just promote homeostasis in the GI tract, and I always recommend the probiotic supplements.

**Dr. Rubin:** But as Tracie and I have both said today, probiotics alone will not reduce remission. We've tried, we've studied it. It may just be a matter of we don't know which ones to use yet or how much of them to use. So we're not opposed to the concept of replacing bacteria to achieve that homeostasis in your gut, we just have to have a much better understanding of which ones, how long and what actually happens not inside the gut itself, but along the lining of the bowel, where these bacteria adhere. And it's a very complicated relationship.

The listeners will be very interested and happy to hear that the Crohn's & Colitis Foundation of America and the National Institutes of Health have both launched major initiatives to study the human microbiome. The microbiome is all the bacteria that live in or on our body. And that's a very important issue that we clearly need to know more about in the future.

**Ms. Frederick:** Thank you, David. We'll take a phone question, now.

**Operator:** The next question comes from Amy from South Carolina.

**Amy:** Hi. I have a question for you. I recently started my daughter on probiotics, I know you've been discussing that just recently. I had ulcerative colitis and had a total abdominal colectomy years ago before she was born, and we started her on probiotics after much

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- Amy: study. And the reason I'm asking is not specific, but I wanted to find out, sometimes when we give her probiotics every day it causes the same symptoms that the actual bowel problems cause. So we started giving it to her every other day. I'm curious to find out if we're doing her any harm. She's 7, with the symptoms being similar, that they are when she's not on them.
- Dr. Rubin: I'm very glad you brought that up because too often we assume that something that's being proposed as natural or alternative is, at a minimum, safe and maybe it's going to be helpful or beneficial. But we have to recognize that some of these things that we're putting in our mouths in trying to treat our diseases may be worse. They may actually make us worse. We don't know that some of the bacteria that have been insufficiently studied, that we're trying to take as a complementary therapy or alternative therapy to our inflammatory bowel disease-controlling therapies, might make you worse. We don't know that. So we commonly throw around terms like good bacteria, bad bacteria. In fact, calling something a *probiotic*, it's built right into the name. But the truth is, when I tell you that we think ulcerative colitis and Crohn's disease may be driven by something in the environment, we don't know that that's not the bacteria that would be normal and healthy in some people without IBD, that's causing the disease in other people who are genetically susceptible.
- So the observation that it may be making your daughter feel worse on some days, may in fact be really due to what you're giving her. It may just as well be due to her disease fluctuating over time and it's hard to know the difference.
- So as much as we want to embrace alternative and complementary therapies and as much as we're encouraged by the rationale behind the use of probiotics, we all have to acknowledge that the lack of evidence for efficacy or effectiveness goes both ways, and also can be a lack of evidence for safety, and we have to be careful and that's one of the messages I share with my patients. I'm supportive, but we all have to be talking about it and keeping our eyes and ears open while we're doing these things.
- Ms. Frederick: Thank you. We have a web question from Diane. When I have a flare it seems that only rest and Gatorade® seem to end the flare. Is it typical and should the sports drink be diluted?
- Ms. Dalessandro: Thanks for the question, Diane. During times of a flare, as I stated during the presentation, we can all lose our appetites. And sometimes Gatorade is all that you can tolerate. And if you're in a severe flare and you're only taking in fluids, I don't think I would be diluting it at that point. However, you can also try making high-protein shakes, and you can use soy milk, and you can use a banana, and you can use frozen mango, and you can use all kinds of things that are very high in nutrients that are relatively easy to digest and will be beneficial to you in maintaining your energy, maintaining your protein balance, and just making you

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Ms. Dalessandro: feel better overall. That would be my basic recommendation and I think that you would probably be able to tolerate some kind of protein shake.

Dr. Rubin: I'll add to what Tracie said. I completely agree with what she said. And I'll just throw out that what people call *flares* varies and differs from even what other patients think are flares. And certainly what doctors are sometimes thinking is a flare. So remember that our goal for disease control in inflammatory bowel disease is a stable, sustained, steroid-free remission. And if we do nothing in some patients, they will cycle in and out of remission by themselves and that's okay, as long as we acknowledge that number one, it shouldn't affect your quality of life; number two, that we don't want it to result in surgeries and bad outcomes downstream. And we've learned that if we control the disease, we reduce the likelihood of relapses and flares, we're going to reduce the likelihood of surgeries, hospitalizations, exposures to steroids and the effect on our quality of life.

So when a patient says, "I'm flaring and I need to do certain things to get it back under control," that's good. I like people who are in touch with their bodies and understand what to do when they feel badly. But I would say is if you have a flare more than once in a year, that's too much, and you need to talk to somebody about managing your disease differently. So good for you for knowing how to stay hydrated and to manage those symptoms, but I want to just emphasize that that doesn't mean we should be living with these; it's not acceptable.

Ms. Frederick: We have another web question. If you are unable to take a fish oil supplement, is it okay to take a flaxseed oil supplement?

Ms. Dalessandro: Flaxseed oil is the vegetarian source for omega-3 fatty acid. And most of the studies have been done with fish oils, although those studies have not shown efficacy in terms of maintaining or keeping someone in remission. However, I do feel that omega-3s are beneficial in general and certainly taking a flaxseed oil supplement would be beneficial. Have the studies been using omega-3s as flaxseed oil? No. But do I feel it's beneficial? Yes. And it is a vegetarian source of omega-3 fatty acid.

Ms. Frederick: Thank you. And we'll take a telephone audience question now.

Operator: The next question come from Golda from New Jersey.

Golda: I would like to ask Dr. Rubin a question. I'm taking mercaptopurine and I would like to know how safe it is, to take it over a long period of time?

Dr. Rubin: Golda, that's an excellent question. That's about a medication called 6-mercaptopurine, and that's in a class of therapies we use commonly in Crohn's disease and ulcerative colitis to

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Dr. Rubin: maintain remission and control the disease. We've known about 6-mercaptopurine and the drug that's related to it, azathioprine, that many listeners may be on, for many years. In fact, it's one of our oldest therapies that we've been using. And what we've come to appreciate is that over the long term it appears to be very safe, especially if your body is metabolizing it right and you've been monitored by your doctor with routine blood counts. And most importantly perhaps, that it's controlling your disease.

There has been with those therapies a small, but real, increased risk of lymphoma, but it's not clear whether that's related to disease or drug. Seems to be that it's possibly drug. It's also not clear if it's related to duration of therapy, but it doesn't appear to be predictable by that. In other words, the longer you're on it, the risk of lymphoma seems to be the same rather than increased over time.

So overall, this is a very common therapy and we think it's extremely safe and it certainly is an effective maintenance strategy for your disease. So I think that it's something you want to stay on. There have been a couple of trials now that have demonstrated that people who have been in remission on mercaptopurine and have done well for a number of years and they withdraw the mercaptopurine or they stop it, unfortunately the disease comes back and they relapse. So despite the fact that when you're feeling good on these therapies, it seems like maybe you don't need them anymore. This is a chronic condition and until we learn more about these diseases, we're not going to be able to withdraw therapy without risk of problems.

Ms. Frederick: Thank you very much for that question. And thank you to everyone for all of your great questions.

I'd like to thank Dr. David Rubin and Ms. Tracie Dalessandro for your time and expertise. We truly appreciate you being here with us today, and for all of your work on behalf of patients with ulcerative colitis and Crohn's disease.

A special thank you again to Shire for making today's program possible.

And most importantly, on behalf of the Crohn's & Colitis Foundation of America, we hope that you enjoyed today's program.

Please remember to fill out and return your evaluation forms either online or use the evaluation provided in your registration packet. And for our webcast audience, the link will come across your screen in a couple of moments.

And for more information about today's program and the information on our upcoming teleconferences, which will be on May 7 and June 9, for disease-specific information or if



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Ms. Frederick: you'd like to get involved in our Spring Take Steps® Walk or our Team Challenge® Half Marathon, please call our Information Resource Center from 9 am to 5 pm Eastern Time, and that number is 888-694-8872, or visit our website at [CCFA.org](http://CCFA.org).

Thank you again for sharing this time with us. This concludes today's program. Good-bye.

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