

Well, listeners, it may seem difficult to believe, but by this time next year, we anticipate the new Golisano Children's Hospital will be open, serving the children and families of Central New York. As you know, there are fundraisers going on to help pay for this new, fantastic facility. Some of them are more fun to talk about than others, and that's true for this conversation. In the studio with me this morning is Toni Gary, Director of Community Relations for the Upstate Foundation. Good morning, Toni.

Morning, Trisha. How are you?

I'm great. Welcome back. We talked about the radiothon last year, but this year, new and improved. Tell us about it.

Oh, it's wonderful. The children's hospital will be opening next year, we're hoping springtime to late summer. We really have the money for that facility all in hand and taken care of. It's those special things that make it a children's hospital that we're fundraising for all the time. We've always fundraised for pediatrics and radiothon is one of those. This year, December 4th and 5th, WSYR Radio, 570 News Radio . . .

Right, right here on our own channel.

Right here on our own channel, will again be helping us with this. It's our sixth year, so pretty exciting to be doing it for this many years. We'll be live for two days, those two days, out of the upper lobby of the hospital.

Excellent. Excellent. One of the things that always impresses me about the children's hospital, and this is kind of my personal moment to mention this. We've interviewed a number of the doctors who work with the children in the pediatric parts of the hospital. It always strikes me that people don't understand the services that are here in Syracuse and Central New York. One of the things that sticks in my head is Dr. Richard Sills, who mentioned, when people come to Upstate and University Hospital for cancer treatment, they're getting the same treatments and protocols that they get at St. Jude's, Dana-Farber, some of the big cancer centers. That's really what you're talking about, isn't it?

It is, certainly. Part of radiothon, and any of our events, is to make that awareness so much clearer to families in Central New York. I think you'll find that in any of the situations, once you talk to a family and they say, "We didn't realize that this was available here," especially cancer treatment. I met with a young family last night in preparation for radiothon, an interview. The mom was just so committed to staying here in Central New York and having her little boy cared for here. She had a young daughter and she didn't want to go to St. Jude or to Dana Farber or to someplace far away. You can talk to anybody else and they'll tell you, "A protocol is a protocol is a protocol when it comes to treating children." Even St. Jude and Dana Farber use some of our own protocols that we have developed here at Upstate.

According to Dr. Sills, they all share that information. Whatever protocols they'd be getting at one of those other hospitals, they get here and vice versa.

So true.

Very interesting. We're going to talk about the radiothon and the Change Bandits Program. Talk to me about Change Bandits. This is fun.

Change Bandit is a great way for everyone to be involved. You can collect change from your friends, your neighbors, your Girl Scout troop, where you're working.

And we're talking about the change in your pocket or in your wallet.

Change in your pocket and search that couch, and not just change. The dollar bills help, too.

Sure.

We'll send you canisters. We're always encouraging people to call 464-KIDS, and that's 5437, 464-5437.

We'll make sure we repeat that.

Get your Change Bandit kit early. Call us. We'll send that out to you. You can come by and pick it up. One thing that we're going to add to this this year is you're going to be able to drop off your big change canister in a big barrel outside of the hospital both days. So you can pull around our big circle here at University Hospital on Adams Street and drop off your change. Bring friends with you and have them drop off their change, too.

So you don't have to worry about a parking place or coming inside or anything else. You can just do it right outdoors?

Can do it right outdoors.

Outstanding.

And we're going to be out there from pretty much dawn to dusk.

Now, some of the money that you'll be raising from the radiothon, or maybe all of it, is going to go towards some of those special things in the hospital you were talking about. What are some of those special things?

We've always provided the other things, the extras, when it comes to pediatric services. As a state institution, we don't get as much money as everyone seems to think, and it's less than ten percent, actually. When it comes to treating children, we know what it's like to be an adult, to be a little frightened going into the hospital, having cancer. Any of these things are very scary and traumatic for a child. Part of what we're able to do with this additional fundraising is to make a difference, whether it's that first-run DVD, that movie that's out, whether it's a comfortable place for mom and dad to sit, it could be making sure that there's birthday parties for children when they're in the hospital, staying connected, that they're able to talk to their school and their classroom. We're looking at purchasing units to do that so that when a child is in the hospital . . .

Like video units?

Like video units.

Fabulous.

Kind of similar to what we see in high tech -- we're all high tech here and computer hookups.

That's fabulous. So you're really trying to make the child as comfortable, make them feel as much at home as possible?

As much at home, not scared, to occupy them in between treatments so that when they're going into a treatment room, it's a nicely decorated area with some distractions so that they're not completely frightened by the whole experience. And our wonderful Child Life women, it's just amazing what they do to help children and families every day. We met a young man, who is now early 30's, who was treated here as a little boy, at eight years old, for cancer. He and his dad were just so grateful that they wanted to come back and help. We thought, "Let's interview them for our radiothon coming up." He sat down with a little girl who was being treated for the same type of cancer. The mom was so encouraged by it and the child life specialists helped put that together. It was wonderful.

How fabulous. That's just such a sense of hope. That's fabulous.

Those are the exact words mom used.

Let's talk about some of the details to make sure people understand. The radiothon, that means our local celebrities are going to be there, right?

Yes, they are.

Joe Galuski, Jim Reef [assumed spelling]?

Yes, Joe, Jim. Ellen Abbott [assumed spelling] will be there. We'll have a few other people filling in during the day. You'll meet many families that have been treated here recently and maybe a few years back and maybe update you on what the condition is of their child.

Excellent.

It's that Thursday and Friday, December 4th and 5th. 464-KIDS, you can call now. You can call during it.

Okay.

We're always available.

And you'll be there all day long on those days.

All day long.

That's just great.

I hope you'll come by.

I definitely will. I definitely will. And we will also put this information with links from our Healthlink OnAir website. Toni Gerry from the Upstate Foundation, thanks so much for coming by.

Thank you.

Hi. I'm Dr. Rich O'Neil [assumed spelling] with this week's Check-Up From The Neck Up: I just got fired or giving thanks for catastrophes. So, dear listeners, I got fired. I had this nationwide radio gig doing Checkup from the Neck Up and the executive producer called and said, "It wasn't this and it wasn't that," and that was that. I'd never been fired before, so this was a new experience. Back at the ranch, I was telling my wife and I just started laughing. Then this week, my monthly 401k statement was lurking in my mailbox. You know, I've been doing all the things the financial folks say you should, making regular contributions with payroll deductions, having a big chunk in stocks because I'm still a decade or so away from retirement, diversifying across bonds and stocks, foreign and domestic. So, as I'm ripping it open I'm thinking, "How bad can it be?" Page Three had one of those performance graphs for the past year. It looked like a ski slope, downhill version, Olympic style. For some reason, that Italian skier who called himself La Bamba came to mind. Looking at it and thinking, "La Bamba," I just started laughing, belly version. My wife walks in and I'm holding it up for her to see and she says, "I'm glad you can laugh about it." I said, "What else can we do but laugh?" From whence were those guffaws bursting forth I wondered. Then, at Thanksgiving dinner, it suddenly came to me. It was pie time. Our hostess was slicing and served out a piece of the pumpkin pie. From nowhere, my brain makes the comparison, "There goes my nationwide radio gig." When she cut another piece, my neurons announced, "Bye-bye 401k." But then, someone wanted pecan pie, so she moved on. I'm still mesmerized by the pumpkin with the two missing chunks. I realize the rest of this pie is like the rest of my life. It's still there, my wife, my kids, friends, relatives, my health, work, my day job, my energy that lets me do almost anything I want. The lesson for me? While out-of-the-blue catastrophes are useful and they give us a chance to narrow our focus and make big adjustments we might otherwise avoid, it's important not to get stuck in catastrophizing. Instead, shift up to the big picture to discover that fame is indeed fleeting, and apparently so is money. But a good laugh, especially in the face of some of the worst life tosses our way, well, that's something for which we can be especially thankful. I'm Dr. Rich O'Neil. Thanks for listening.

Welcome back to Healthlink OnAir produced each week by SUNY Upstate Medical University, making the academic difference in the Central New York Community. This is your host Trisha Torrey, every patient's advocate. Thyroids and thyroid disease, a topic we haven't previously covered here on Healthlink OnAir, so it's about time. It's one of those problems that many people have, many people don't realize they have, sometimes tough to find out that you have it, and mostly just something we should all be aware of. Dr. Jennifer Kelly, Assistant Professor of Medicine at SUNY Upstate Endocrinologist at the Joslin Diabetes Center and fast becoming a frequent guest, joins us on the show this morning to talk about thyroid and different problems we have. Good morning, Dr. Kelly.

Good morning. Thank you for having me back.

We're going to start with the basics this morning. What's the thyroid?

Well, the thyroid is a gland that's located in the neck area. It's butterfly shaped and it secretes thyroid hormone.

Once somebody had said to me, "I think your thyroid is in your thigh," but it's not, is it?

No, not exactly.

All right. It secretes hormones. What kinds of hormones? What are they for?

It secretes thyroid hormone. There are two types of thyroid hormone, T4 and T3. The thyroid mainly produces T4 and then it's turned into T3 in the body.

Okay. And what are those hormones for? What do they do for us?

Well, thyroid hormone does a lot, actually. It regulates metabolism, so many people associate the thyroid with weight disturbances. Really, a lot of well being. When the thyroid is off, it can affect almost every aspect of the body, neurological problems, cardiovascular, mood disorders. Really, it's a very important hormone.

So it's really kind of a regulation, a body regulation hormone?

That is true.

All right. Let's talk about some of those regulations. That's what brings up symptoms of problems. What are some of the problems that develop with the thyroid?

Well, the thyroid, we tend to look at it in two different ways: its anatomy or shape and size and its function in terms of how it's producing hormone.

Okay.

So someone may have a problem with one or the other or both and they may be interrelated.

All right.

So the thyroid, it could be enlarged and it could possibly even have nodules on it, which are little bumps.

Okay.

These are common and generally benign, but if they were to grow or looked concerning, we might want to pursue that further. In terms of the hormone, the thyroid could produce too much or too little. That would be something we would want to look into also.

Okay. Let's talk about what those things are called. I think those are names that people are going to recognize, they just probably don't know what they mean. I certainly didn't, so I've learned a lot from just getting ready for our conversation this morning. I've heard of people who are hypothyroid. What does that mean?

Hypothyroid means that the thyroid is underactive, not producing enough hormone.

Okay.

And then what would the symptoms be of someone who's hypothyroid?

Generally, everything is kind of slowed down. So metabolism slows down, so people may put on weight. They may feel fatigued. They may have slowed bowel movements, become constipated, may feel cold. In more extreme cases, the heart rate may slow down. So there's a whole constellation of symptoms. In females, it may throw off menstrual periods.

Okay. And is it mostly male or female or is across the board, people who have hypothyroid?

Generally more common in females but does occur in males also.

When does it pop up? Is it something people are born with?

There is a congenital hypothyroidism, meaning that you are born with that disorder, but that's more rare. General primary hypothyroidism is somewhat common. It's generally detected young to middle age, more so women than men.

It is. Okay. So if somebody is feeling those symptoms, they feel like all of a sudden they're gaining weight or is this something that those of us who are carrying around a few extra pounds, can we assume we're all hypothyroid?

No. Unfortunately, if you look at the constellation of symptoms, feeling fatigued and some problems with weight, unfortunately, many people do experience those symptoms. So it's not necessarily related to thyroid but certainly something to look into.

Okay. So if you're having those symptoms, you go, what, to your primary care doctor?

Yes, you could address with your primary.

All right. And would you primary know to run a thyroid test? That's a blood test, right?

Yes.

Okay.

Sure. Most primary care physicians are aware of thyroid disorders and would look into ordering that test if the symptoms were suggestive.

All right. Is it something then, you, as an endocrinologist, it's something you treat. If you have problems with your thyroid, do you need to see an endocrinologist?

Perhaps. It depends upon exactly what type of symptoms you're having and what types of problems and what tests have been done and what they've shown, and perhaps also the primary doctor's comfort level with treating it themselves.

All right. So now we move on, hypothyroid. We'll move to hyperthyroid. Too much, yes?

Yes. So the thyroid can produce too much hormone. That can happen either from an autoimmune disorder called Graves' Disease where the whole thyroid puts out too much hormone, or there may be one or more little bumps or nodules on the thyroid that are putting out too much hormone. Those are the common causes.

All right. Now, I've heard of Graves' disease before. If I remember correctly, there's a treatment for it that people swallow something that's, I don't know, is it radioactive or something like that?

Yeah. Sometimes people get a little scared when they hear that it's radioiodine, the treatment.

Do we glow in the dark afterwards, right?

Thankfully, no. For any type of hyperthyroidism, whatever the cause, but certainly Graves' disease is the most common, there are three treatments. One is radioiodine, because the thyroid takes up iodine. If the thyroid is overactive in the sense that on a thyroid scan it shows that it's lighting up with too much hormone, we can give a higher dose of radioiodine to kind of kill off the overactive cells. Another treatment would be using antithyroid drugs. That slows down the production of thyroid hormone from the thyroid. Then also, surgery is an option, but we generally do not recommend that unless there are other extenuating circumstances.

So if somebody needs to take these drugs, either for hypo or hyperthyroid, is this something they're on for the rest of their lives or is it something you treat and then it's taken care of?

For hypothyroidism, the only treatment would be to give thyroid hormone back because the body is not making enough hormones so we're giving the hormone back. For many people, they do end up on it for a lifetime. There are some reasons not as common as primary hypothyroidism called thyroiditis, where it's just a brief period of time where the thyroid might be over or underactive and they might not require treatment long term, but that's not as common as people that need consistent thyroid hormone replacement. In terms of hyperthyroidism, if we were using the anti-thyroid drugs to slow down the thyroid hormone production, generally they're given for about two years and then we try to wean people off of the medication. Even though they are fairly safe, there are still some potential side effects.

There are? One of the things I've also heard about Graves' disease, and I don't know why I remember this, Barbara Bush had Graves' disease. They talked about that's why her eyes looked so big. Is this something you run into with this Graves' disease all the time?

Not all the time, but sometimes. Depending upon the extent of the disease, some people may have an area where it affects their eyes. People describe it as being bulged out. There are more medical terms, but that is a way that it can present.

It is. All right. So is that a result of the medicine or is that a result of the hyperthyroidism to begin with?

It's a result of the hyperthyroidism, the state of it.

I see. So once you treat it, then that wouldn't be true anymore.

Sometimes.

You would hope.

Yeah. Unfortunately, some people need other types of interventions. They may need to see an ophthalmologist that specializes in this area and have other types of treatments.

Okay. All right. So that's Graves' disease. Another one that I read about was Hashimoto's disease and that's also a thyroid problem.

Yes. So Hashimoto's, and generally whenever we're talking about the disease stage, they're generally named after someone. So that's where this name came about. This is the most common form of hypothyroidism meaning, again, an autoimmune disorder. A lot of the things related to the thyroid are autoimmune.

Meaning?

Meaning where there are antibodies in the body that are affecting a certain part causing a problem at that area.

So in that case, you would have something in your own body that was keeping your thyroid from working correctly.

That's right.

Okay.

So with Graves' disease, there are antibodies that affect the thyroid to cause it to put out too much hormone, whereas with Hashimoto's, there are antibodies affecting the thyroid causing too little hormone.

All right. So is Hashimoto's treated then the same way hypothyroidism is? Are they the same thing?

Basically, Hashimoto's is one reason for hypothyroidism.

It is? Okay. All right. What's a goiter? That's also related to the thyroid.

True. Goiter is just a descriptive term meaning that the thyroid is enlarged.

Okay. So it's not something that's on it or somewhere else.

Right. It doesn't necessarily mean it's a disease state, it just means that it's enlarged.

So it's just a thyroid that's big.

Right.

That's interesting. I think people think that it's something that grows somewhere. Thyroid cancer, I don't know anyone who's ever had thyroid cancer. Is it a cancer that's very prevalent?

Somewhat, unfortunately. It does tend to happen more so in younger people. The good thing about thyroid cancer is that it's very treatable.

It is treatable? Good.

No one wants to have cancer, but if you had to have one, thyroid is not a bad one. Really, most people have excellent success rates and do very well.

That's great. As far as in general, thyroid, is there any way to prevent thyroid disease?

Not really. One thing is keeping a good iodine diet, which, in the United States, generally is pretty easy if you eat normal samples of food as salt has iodine added to it. For the most part, people will receive enough iodine unless they're severely restricted in their diets. That's about all that we can do ourselves for thyroid health.

All right. So there aren't supplements to take or other vitamins in food, just iodine. That's a mineral, isn't it?

Yes.

That's interesting. So that's the one thing that regulates the thyroid?

As I said, the thyroid hormone, it's actually formed from iodine. So the thyroid takes up iodine.

So we shouldn't necessarily be avoiding iodine salt and those kinds of things as long as we don't seem to have problems with our thyroid.

Sure. I wouldn't recommend to overdo salt just in general, but for a normal American diet, it's generally not a problem.

In general, too, when you see thyroid problems in people, is this something that they, if they know they have a problem, they should be looking for a cure or is it something they need to be managing?

In terms of thyroid cancer, certainly a cure. You would want it surgically removed and treated. In terms of just plain problems with the thyroid such as hypo or hyper, for hypothyroidism, the treatment is to give the hormone back. So that's really a chronic replacement and people tend to do very well once their levels are regulated. In terms of hyperthyroidism, we try to correct the underlying problem. We don't want people to remain hyperthyroid because too much thyroid hormone can be problematic also. In that sense, we want to stop the hyperthyroidism. Sometimes the treatments, though, for hyperthyroidism may cause someone to become hypothyroid and then they may require a thyroid hormone.

So you have to balance it out.

Yes.

Very good. Well, I think that's it. I thank you so much for coming by. We've learned a lot about thyroids. As I said, we hadn't discussed it before and it seemed like a good conversation to have on Healthlink OnAir. Thanks for coming by Dr. Jennifer Kelly.

Thank you so much.

And listeners, we will take a break now. We'll be back in just a few moments. This is SUNY Upstate's Healthlink OnAir on 570 WSYR.

Welcome back to Healthlink OnAir, produced each week by SUNY Upstate Medical University, making the academic difference in healthcare in the Central New York Community. This is your host, Trisha Torrey, every patient's advocate. Well, listeners, you know we enjoy discussing medical research from time to time. Of great interest to me specifically is research that's fairly easy for us patients, non-medical people, to understand the outcomes and the direct benefits to patients. The conversation we're about to have fits that bill very nicely. First, let me introduce our guest Gary Nieman, Assistant Professor of Surgery and Researcher at SUNY Upstate. Good morning, Gary.

Thank you.

Thanks for coming by this morning. I want to set the stage just a little bit. We're talking about research that improves the outcomes for hundreds of thousands of patients, all ages, with lung injuries, many of who die each year, aren't we?

Absolutely.

Explain to us exactly what this is.

What we are studying is a disease or syndrome known as either acute lung injury or acute respiratory distress syndrome, ARDS. This is a disease caused by trauma from a severe car accident, stabbing, shooting, a fall, where there's a lot of tissue damage, and often hemorrhage, but not necessarily directly injuring the lung, at least not initially. What occurs, following the injury, is that the immune system, which is designed to fight bacteria and keep us safe, is very much fired up and very much amplified. This usually just attacks the bacteria. In this case, it actually can attack the tissue. In particular, what occurs is that our own white blood cells tend to attack the lung and cause the lung to become leaky. Fluid from the vessels actually leaks into the lung and effectively causes death to these patients, secondary to drowning.

So they've been in an accident but they get sick from something else. They get sick from their own bodies trying to fix what happened in the accident.

Correct. It's effectively like an autoimmune disease. You can think of ARDS or acute lung injury as arthritis of the lung.

Interesting.

Unfortunately, in the case of the lung, we don't survive the injury whereas in arthritis, it's obviously a debilitating injury but it's not life threatening. It also occurs very rapidly, within two or three days, you may develop this following the injury. It may last for a week or two weeks at the most. Then you either survive or don't.

But there are a lot of people that don't survive.

Yes. It's a very high mortality. There are well over 100,000 cases of ARDS per year with 40 percent mortality. So very mortality and we're trying desperately to reduce that number. We've been working on this from a lot of avenues, both from a pharmacologic, to try to use various drugs, to try to control the immune system so that the injury doesn't occur. Also, unfortunately, the only treatment currently for these patients is support by mechanical ventilation. All of these acute lung injury patients go on a mechanical ventilator. What we've found recently is that if we don't use the proper settings on the mechanical ventilator, that we actually increase the mortality.

Hole mackerel. You've given us a lot. I'm going to slow you down a little bit. This is very, very interesting, but I want to do it in little bite-size pieces for a moment.

Sure.

All right. Somebody has had an accident. They are what, in the ICU? They're in the hospital.

Correct, in the ICU.

In the ICU. All right. Can the physicians or the surgeons anticipate when somebody will develop the lung injury, the ARDS, or can they not?

They can see that a patient is set up for development of acute lung injury or ARDS. That would be the patient that has severe tissue trauma and also had a hemorrhage. So they were in hemorrhagic shock; their blood pressure was very low for an extended period of time and if they become infected. If the bowel is ruptured and they have feces in the peritoneum, in the belly, then that can setup a blood infection known as sepsis. Sepsis is the number one killer in the intensive care unit. It predisposes the patient to go on to this autoimmune disease. Because of the bacteria contamination, the inflammatory system is really ramped up to knock out the bacteria. If it goes overboard, it tends to attack our own tissue.

Okay. So now we know that these folks are in the intensive care unit. We know that they are at risk for developing this injury and then this problem.

Correct.

You've done research now to help those people because this mortality rate is so high.

Correct.

All right. So let's talk about the research. If I understand it, it's really two different things. One is, there's a mechanical ventilator that can help some people. Then there's another genetic approach you're taking, and that's really the one I'd like to concentrate on. Tell us about that research.

Okay. The genetic approach is very unique. Upstate is collaborating with the University of Rochester. We're just down the throughway. It's very exciting to get these collaborations between universities. I'm working with a Dr. David Dean from the Pediatric Department at the University of Rochester. What he has found in his research is patients that develop acute lung injury, there is one molecule in the cells in the lung that tends to become eliminated during this inflammatory process.

Is that one of the things that's contributing then to the high mortality rate?

Absolutely.

Okay.

What occurs is if this molecule, which is an enzyme that helps the cell to regulate its fluid balance. Once that is eliminated, the cell can't regulate its fluid balance and the cell will die. If the cells in the lung die, then the fluid from the vessels can move into the lung and fill up the lung, and the obvious problems you have with that. So what Dr. Dean has come up with is an idea to take a plasmid, which is a piece of genetic material, just for that particular protein in the cell that has become eliminated. He then wants to inject this into the cell such that the cell now starts to make that protein again. If the cell starts making the protein again, the cell will live. If the cell lives, the lung lives. If the lung lives, the patient lives.

Very interesting. So, if I understand correctly, you're talking about a genetic fix for an environmental problem.

I think it's not an environmental problem, in a sense, but an internal problem.

Right. But if somebody was injured in a car accident, that's not something that would have happened to them naturally.

Okay. Right.

That's what's fascinating to me. Any of the genetic research, I think, is just so interesting and the whole personalized medicine aspects to it. Does it have to be that person's genetic material?

No. A little piece of genetic material is just going to code for that particular protein. That's really all you need. You just have to put those sequences of

amino acids, which are the individual proteins that make up the gene, you have to put them in the proper sequence. Once it goes into the cell, the cell will automatically start to make that protein again once it sees that genetic code.

So is part of your research trying to figure out at what point the cell stops working correctly?

That's sort of a difficult game to play.

I'm sure.

What we're hoping to do is, if the patient has obvious symptoms and we know that they are developing acute lung injury, at that particular time, we would treat with the genetic material.

Very interesting. Now, some of your work is already being used and already is saving lives. Talk about that part of it.

A large group of investigators termed the ARDS or the Acute Respiratory Distress Syndrome Network, we got together. It was funded by the NIH. They did a clinical trial on hundreds of patients, seeing which mode of ventilation was the best, would reduce the mortality the most in patients that had ARDS. It was a very simple experiment. One group of patients, they gave the standard of care at the time, which was a volume of 12cc of tidal breath, which is the breath in and out each time, to each patient. The other, they just cut it in half. They used half that, which is 6cc per kilogram of tidal volume. Then they conducted a study for several years until they had enough patients. When they analyzed the data, the patients that had the smaller tidal volumes, they reduced mortality by 22 percent. So with our research, we already know how to better manage the patient with mechanical ventilation.

Excellent. Excellent. So you already see great outcomes from the work you're doing. One of the things I love about this, too, is that you have student doctors working with you. They're doing research with you? Talk to us about that.

We have several categories. The major category are surgical residents, medical doctors that are being trained as surgeons. They come into our lab for between one and three years to learn the experimental process, to conduct experiments, to write papers, to go and present their data. We also have medical students that come in, usually for the summer, and, again, teaching them the experimental procedure, putting papers together. We also have some undergraduate students who are very energetic and hardworking and come to the lab very early.

I love that part of the story. What that means is you're not only setting this up for the patients of the future, you're setting it up for the professionals of the future and that benefits everyone. Well, this is fascinating research. I thank you so much for coming by this morning, Gary.

Thank you.

Listeners, we do need to take a commercial break. We'll be back in just a few moments. This is SUNY Upstate's Healthlink OnAir on 570 WSYR.