

RSV: The OTHER Respiratory Virus



PODCAST 5 - Part 1

Dr. Jill Sellers:

Welcome to the *On Medical Grounds* podcast. I'm Jill Sellers, your host. *On Medical Grounds* is a casual, friendly place where you can find an authentic, audible blend of timely scientific and medical knowledge. We talk with experts about their experiences and knowledge, the utilization of new therapies and challenges within the world of healthcare. Select podcasts offer continuing medical education credits for those of you needing an additional why you should listen. We provide perks to all posted podcasts by linking content so you can drink in more if you so choose.

Lately, it seems that everything health related is revolving around COVID-19, yet another respiratory virus that is commonly overlooked has raised concerns in the medical community. Respiratory syncytial virus or RSV is on the rise across the United States and surging in some locations in the South, filling up pediatric hospital wards and posing a serious risk to the children and older adults that contract it. This is the first of two episodes that will focus on RSV, the threat, the tools available to diagnose it and developments on the horizon to protect against it.

Our two guests today will focus on the pediatric side of RSV. Our first guest is Dr. Joseph Domachowske who is professor of pediatrics and professor of microbiology and immunology with tenure at the State University of New York Upstate Medical University in Syracuse. He also serves as the director of the global maternal child and pediatric health program at the Center for Global Health and Translational Science at SUNY Upstate Medical University and has an international appointment as the director of the research center of the SUNY Upstate Medical University Teófilo Dávila Hospital in Machala, Ecuador. His specialties and research interests are pediatrics and pediatric infectious diseases. Dr. Domachowske completed his medical degree and residency at the SUNY Health Science center in Syracuse, New York and completed a fellowship at the National Institutes of Health Laboratory Host Defenses in Bethesda, Maryland. I will link to a more complete bio of Dr. Domachowske in the show notes. Welcome to the *On Medical Grounds* podcast, Dr. Domachowske.

Dr. Joseph Domachowske:

Thanks very much. It's great to have the invitation to be here.

Dr. Jill Sellers:

Without going into a lot of detail and for full disclosure, the topic of RSV is important to me because my second daughter was diagnosed with it at five weeks old. The week prior to the RSV diagnosis was exhausting, worrisome because she was congested, she had a cough and was tachypneic and I had to hold her upright against me at night so she could sleep. And all the while I kept calling the doctor and they'd say, "Give it another 24 hours, give it another 24 hours." Looking back, the most frustrating part of that time was what it took for her to be diagnosed. It was almost a full week. And then finally, when we got her in and they

diagnosed her with RSV and hospitalized her, relief came and we had great care at the Walter Reed Army Medical Center, but I can't help but think, it seemed to be an afterthought in our case, RSV. And looking back, I think it was primarily an afterthought because she was a full-term baby. My question is, how serious is RSV? And does it often go undetected or overlooked when trying to make a diagnosis?

Dr. Joseph Domachowski:

Yeah. RSV or respiratory syncytial virus infection is so common in young infants, so commonplace and the signs and symptoms overlap with so many other different respiratory viral infections that could be easily overlooked or ascribed to something else. But the situation that you're describing, especially as you got into it, really is very characteristic for RSV infection and so many of our infants are infected every year.

Dr. Jill Sellers:

Well, how does the presentation of RSV differ in a pediatric patient versus an older patient?

Dr. Joseph Domachowski:

Well, unlike many infections that we're familiar with, once you have a serious RSV infection, you don't necessarily have protection against another RSV infection later on in life, even a year later. Children often will get RSV infection year after year for several years in a row. Each subsequent infection is generally milder than the initial one and then there can be a period of time where there may not be infections from year to year. Older children, young adults and elderly adults also get infected, particularly if they're around other younger kids. When they get infected, they tend to only get mild cold type symptoms but as we age, we are susceptible to more serious consequences from RSV infection as well.

Dr. Jill Sellers:

What are some of the common methods of testing for and diagnosing RSV? And does that differ based on the age of the patient?

Dr. Joseph Domachowski:

Sure. The best test for diagnosing RSV infection for any age now is doing so using PCR. And PCR is familiar to us now because it's such a common test used for a COVID-19 infection diagnosis. This is a DNA based amplification type test. There are many different platforms that are used and it is the most sensitive and the most specific test available but not the only type of test available.

Dr. Jill Sellers:

Would you describe RSV testing easy? Or has it become easier?

Dr. Joseph Domachowski:

RSV diagnostic testing has really become much more easy than it used to be. I remember going up and down the wards in the middle of RSV season, the cold and flu season, and doing nasal wash samples on hospitalized infants with what we call bronchiolitis. And washing them means laying them on their side and squirting five to 10 CCs, so that's one to two teaspoons of saline into the superior nostril and suctioning from the inferior nostril. It's very unpleasant procedure for both the person doing it and obviously for the baby, but it was necessary at the time because the diagnostic testing was not quite as sensitive. We used antigen tests back then and it was more difficult to get a positive result with those types of tests.

Dr. Jill Sellers:

Do the testing methods differ depending on the age of the patient? Would you do these nasal washes with older patients too? Or just the infant?

Dr. Joseph Domachowski:

Yeah. The only reason I would consider nasal washing in these days would be for research purposes to culture the virus at a high level of sensitivity. The PCR type tests that we use for really all age groups now is so highly sensitive we don't have to do washes anymore. We can do a simple nasal swab or a nasopharyngeal swab, which is commonly used for the diagnosis of many types of illnesses cause respiratory trouble, including COVID-19 of course. And we don't have to use the deep nasopharyngeal swabs either anymore. We know that the nasal swabs more in the front part of the nose are highly effective, especially for use in infants.

Dr. Jill Sellers:

That was going to be my next question is which of these methods was more accurate and reliable? You just answered that.

Dr. Joseph Domachowski:

Yeah, I think the nasopharyngeal swab is going to give us better accuracy and reliability just because the manner in which the sample is obtained, the quality of the sample is going to be better guaranteed.

Dr. Jill Sellers:

I'm curious, there's been a lot of CDC guidelines being discussed recently with COVID, but what are the current CDC guidelines and health department reporting requirements regarding acute respiratory illnesses such as RSV?

Dr. Joseph Domachowski:

Well, in general, there aren't any unless we're talking about other types of respiratory infections, like whooping cough, pertussis, which is a vaccine preventable infection. But for RSV and its nasty relatives, we don't have clear written out CDC guidelines or even local health department guidelines. The committee on infectious disease from the American Academy of Pediatrics put together a nice guidance statement several years ago, which basically speaks toward the benefits of doing RSV testing in some circumstances and the lack of utility in doing so under other circumstances.

Dr. Jill Sellers:

How has the emergence of COVID-19 changed the diagnosis and treatment of RSV?

Dr. Joseph Domachowski:

Yeah, such a great, intuitive, insightful question. From March of 2000 until very recently we saw very little hospitalized RSV at all in infants and in our community in Upstate New York, we typically see approximately 200 hospitalizations every RSV season and last season we saw two.

Dr. Joseph Domachowski:

The community response to COVID-19 with distancing and masking and really staying at home, isolating, frequent hand washing, all of those things were highly effective at preventing the transmission of both RSV

and influenza, quite frankly, because of the efforts that we were putting forth to try to reduce the rates of COVID-19 infection.

Dr. Jill Sellers:

That brings up a good point with my particular case with my daughter and her RSV because we had brought her home from the hospital, she had not gone anywhere, so we must have brought it in somehow to her. And I think that's another reason why it took them so long to think it was RSV and then finally take her through the testing for it because she hadn't been anywhere and we were being very cautious. But so I guess that that can happen. Discuss some of the precautions taken to contain RSV once a patient has been diagnosed.

Dr. Joseph Domachowske:

Well in the hospital, we use contact precautions for RSV, which surprises many people, because most of the time, if we're going to prevent RSV transmission or sorry, respiratory viral transmission, you would think a mask is required but RSV is transmitted much more effectively across fomites, doorknobs, and hands that recently had touched secretions or maybe holding the baby, trying to take care of the baby and getting their hands contaminated and then cross contaminating perhaps another individual or touching your nose or your eyes. That's really how RSV is transmitted. The specific guidance in the hospital is called contact precautions but in a household, that's extremely difficult to do. What we advise folks is really good hand washing. And if you have an older child that's been diagnosed with RSV or has an RSV-like illness and you also have a younger infant in the house, is to be really careful about the types of interactions those two are having while the older child is symptomatic.

Dr. Jill Sellers:

Okay. Yeah. I'd like to talk a bit about the RSV vaccine that's under development. Have you participated in the clinical trials? Or do you have any recommendations on whether or not you would have your patients get that once it's available?

Dr. Joseph Domachowske:

Yeah. There are several efforts that are ongoing for RSV vaccine development and I've been involved in those types of clinical trials for infants, young children and even for women during pregnancy, on and off for the last 20 plus years. The most recent developments have changed everything based on two scientific discoveries that were made only about six years ago, that they've allowed enormous progress, an explosion really of progress in the prevention of RSV infection, both in infants and children and potentially even in elderly folks. I think that the RSV vaccine that you're referring to, the one that's furthest along in progress today, is sort of a different mechanism that we're using to try to prevent RSV disease for young infants. And that's using a very high affinity, long half-life, monoclonal antibody. Clinical trials are still ongoing with this but they've shown very promising results with phase two, three results published last summer in the New England Journal of Medicine and more results coming very soon.

Dr. Jill Sellers:

Will the availability of an RSV vaccine change how the diseases viewed and treated?

Dr. Joseph Domachowske:

I'm convinced that these new discoveries that were made that allowed this explosion of progress will change the entire landscape of RSV, especially for infants and young children. As I mentioned earlier, we

have 200 or so infants hospitalized in our small city or small children's hospital in Upstate New York every year and I'm looking really forward to watching that go away to the types of levels that we saw during the COVID period when we were masking and distancing so much. And I think that this new investigational product has the potential to do so.

Dr. Jill Sellers:

It sounds to me like you would recommend without question that your pediatric patients get vaccinated for RSV.

Dr. Joseph Domachowski:

Once the RSV vaccine becomes available, once the FDA gives its nod for safety and efficacy with approval, yeah, absolutely. There's no question in my mind, especially for those children entering their first RSV season, so those under a year of age. That's the group that I think we need to be targeting first. Although there are several other high risk groups that we'll need to pay attention to as well. Older children beyond infancy, maybe in their second, third year of life that have underlying chronic lung disease are patients with cystic fibrosis, those with chronic lung disease of prematurity, underlying congenital heart disease, those types of things.

Dr. Jill Sellers:

Yeah. Any final thoughts on what our audience should know and be aware of regarding RSV?

Dr. Joseph Domachowski:

I think it's always impressed me that influenza is very well known across the general population inside and outside of medicine everywhere and I'm not sure why it gets that much attention, although, the morbidity and the mortality can certainly affect us at any age. And we do have vaccines and antiviral treatments available to either prevent or to treat it. But if we take the young infants, children in their first year of life, RSV is six times more likely to lead to hospitalization compared to influenza. Why is it that so few people really know what this respiratory syncytial virus is? We have to get the word out and increase awareness for how dramatic this virus can be and how pervasive it is every year. We have between one and two percent of our entire birth cohort hospitalized with this infection every year. Any other infection that did something like that would get loads of attention or we have long had a vaccine to prevent it. RSV is that one that sort of lingers. And I think that we really need to increase awareness and make folks understand why it's so important to try to prevent this infection.

Dr. Jill Sellers:

And that is one of the reasons why we are here today. Thank you, Dr. Domachowski for your time and educating us on RSV.

Dr. Joseph Domachowski:

It's my pleasure. It's my favorite thing to talk about.

Dr. Jill Sellers:

As Dr. Domachowski mentioned earlier, RSV is very common in children. The majority of cases are mild and resolve on their own without treatment, yet in some cases, RSV can be very serious. According to the National Institutes of Health, more than three and a half million children worldwide are hospitalized

annually with RSV. For our next guest, the seriousness of a pediatric RSV case is hitting very close to home and heart. Tyler Zongker's four-year-old daughter, Maddie is currently hospitalized with RSV. Tyler, thank you for being here to share your family's story. Having been through an RSV case with my daughter, I know there's a lot on your mind and a burden on your heart right now.

Tyler Zongker:

Jill, first I'd like to just thank you for letting me join you today to share my story and my family's story. Yeah, there's been a lot on my mind and my heart. Anytime that you have a kid that's in the hospital, it's always a very difficult situation. You feel helpless. When they're hurting and crying you sit there, all you wish you could do is take the pain away but all you can really do for them is just sit there, hug them, comfort them and be there for them.

Dr. Jill Sellers:

Let's tell the audience a bit about your daughter and her health status up to the point of hospitalization with RSV.

Tyler Zongker:

Well, with my daughter's health status really, I've got to go back to the time she was born. Maddie was born premature at just 25 weeks gestation. Her original due date was on May 30th of that year. She happened to surprise us on Valentine's Day, weighing in at just a pound four ounces. We were in the NICU with her, which is the neonatal intensive care unit for 146 days before we were able to bring her home. The first month in the NICU, she was on a ventilator helping her breathe. Her lungs were not developed enough to support herself. We had some of our biggest ups and downs in the NICU. One of the sayings and reminders we always got from the wonderful doctors, nurses, respiratory therapists and good reminders we got from them to my wife was just remember, there's always two steps forward and one step back. Meaning as we see her progressing and getting stronger, expect some setbacks. And there were lots of setbacks.

At times it just felt like we had setback after setback. It was very difficult watching our daughter struggle day in and day out in the NICU, feeling helpless because we felt like there's nothing we could do for her. The staff in the NICU, they're some of the most amazing people you'll ever meet. They're compassionate, caring. They're always there for us. They're our emotional support. The best day was when we got to bring her home from the NICU for us. We really miss the NICU staff, we'd develop those personal relationships with them but after being in the NICU for 146 days, it was just, it was joyful to be home with her.

Dr. Jill Sellers:

Yeah. I can only imagine. And because she was premature, does Maddie have any underlying respiratory conditions or chronic lung diseases or other congenital heart problems or anything like that?

Tyler Zongker:

Yeah. Maddie actually has chronic lung disease, specifically what they call bronchopulmonary dysplasia, for short they call it BPD. Through bringing her home and having BPD, this really results in multiple hospitalizations over the course of a two year period. Common colds would basically cause her to go in respiratory distress, would require oxygen and it led to her having to be hospitalized. One of the things the NICU physicians and staff nurses always told us during the time in the NICU, is that really it'll take her up to about age two to really get to the point where she can support herself and make it through things like a common cold. And that really, that held true.

Dr. Jill Sellers:

You've been through a lot with Maddie up to this point. And so you were probably a hypervigilant parent already, but as Dr. Domachowske mentioned earlier, the symptoms of RSV are similar to many other respiratory illnesses and you'd already been through all of this with her. When did you and your wife know that Maddie was suffering from an acute respiratory illness and that it was more than just a sniffle?

Tyler Zongker:

Well, just like you said, it started off as a sniffle, which then led to a cough. Then she developed a little bit of fever so we decided to hold her out of daycare. Throughout the day, her cough just became more frequent. There were more episodes that are lasting longer. From our time when she was younger, we did have a nebulizer in the home. She did start to develop a little wheezing so we went ahead and started doing nebulizer treatments albuterol for her. That evening, I checked her O2 sat and she was sitting around 90% on oxygen, on room air. We sat there and kind of monitored. She was breathing quickly. When ahead and did another albuterol treatment on her, went to bed.

That evening we actually let her sleep in our bed, which is not something we do hardly at all. Just that way we could keep a closer eye on her. Throughout the evening, I just noticed she was breathing harder, breathing heavier. Went ahead and put O2 sat on her, a pulse ox on her, check her O2 sat again and she was hovering around the mid-eighties and I kind of sat there and watched her for a few minutes and noticed that it wasn't improving and even trying to arouse her and get her to cough a little bit. At that point I knew we were destined to be back in the hospital again.

Dr. Jill Sellers:

We should note to our audience that you are a physician assistant and that's why you don't talk like just a regular father. And so your background in medicine probably gave you a headstart in ruling things out and also an understanding of the potential severity of what you could be facing with RSV. I'm curious, how long did it take to get the RSV diagnosis? And were there other respiratory illnesses that they ruled out prior to the RSV diagnosis?

Tyler Zongker:

Yeah, so we knew that in her daycare, they had some cases of RSV in some other classrooms, that we hadn't heard of any in her classroom at the time. Really initially from the beginning, we kind of suspected that was RSV was the probable culprit. At first we took her into urgent care, with COVID going on now, the ERs, you always hear all the stories about how they're overran, they're busy. Well, that is true and that's one of the reasons I decided to take her to urgent care first, where we could get her evaluated quickly because I knew she needed oxygen to help support her.

Going to urgent care, I knew right away that they were going to ship us right to the ER, which is what happened. But we had her on the oxygen. We had her ready to go to the ER. The nurses from urgent care were able to give a really good description of her history and what was going on to the ER staff. Were able to get us a room very quickly, just because she was in respiratory distress. She was very tachypneic, her respirations were in the fifties to sixties. She was just struggling to breathe overall. The RSV diagnosis came pretty quickly. They got her swabbed really quickly. They did rule out COVID, they also swabbed her for COVID. As far as I know, they just did a nasal swab to confirm the RSV diagnosis. I'm unsure whether they used a PCR or an antigen test to officially confirm the diagnosis of RSV.

Dr. Jill Sellers:

Now, when we had spoken prior to this, you had also swabbed her using a home test COVID kit. Is that correct?

Tyler Zongker:

Yeah, that is correct. Actually, my wife had gone to CVS that day and bought one of the Abbott at-home kits. I did swab her for COVID earlier in that day and that rapid test did come back negative.

Dr. Jill Sellers:

Which gave you probably some relief in ruling that out and then it was nice to have that confirmed, I'm sure, in the emergency department at the hospital. Tell me about what Maddie has been going through as a patient and what you and your wife have been going through as you watch her fight through this.

Tyler Zongker:

One of the most difficult things about being in the hospital, especially with a four year old is trying to get them to understand why they have to be there. It's confusing to them why they just can't go home and be at home in their own bed. Having to go through and explain why they have to start an IV on her because she doesn't feel well, so she's not eating and drinking. Trying to keep the oxygen tubing on her so that way she's breathing easier. For my wife and I, really just the physical and mental exhaustion of being up there, not being in our own home. We're very lucky that we have a great support system with family, friends, coworkers. They all reach out and check on us. They're a good emotional support system for us. It's just, again, it's just it's very difficult. It's mentally exhausting being up there day in and day out.

Dr. Jill Sellers:

And I think that until you've been through that, you can't even describe how physically and mentally exhausting that is. What kind of treatment is Maddie receiving to help her body fight this illness?

Tyler Zongker:

For the most part, she is on oxygen. They're doing albuterol nebulizer treatments to try to open up her airways. She's getting the IV fluid support because she's not drinking. At the current time they're doing oral steroids. Just this morning, they're thinking that she may have developed some pneumonia secondary to the RSV diagnosis. I believe this evening they're going to actually be starting her on some IV antibiotics. They think she may be developing a bacterial pneumonia secondary to the RSV.

Dr. Jill Sellers:

I am very sorry to hear that. That's a complication. And the other complication in this case is COVID. You're in an area of the country that is experiencing a surge in hospitalizations due to the Delta variant. Do you feel like the surge in COVID cases is impacting the care your daughter's receiving?

Tyler Zongker:

Yeah, so first I'd like to just say that the nurses, physicians, respiratory therapist, pretty much everybody that we've encountered this hospital stay, they've been nothing short of amazing. That being said, COVID has complicated how healthcare is delivered, especially in the hospitals. Talking to the nurses, the respiratory therapists, everybody up there, they have staffing issues. They are overworked. They are being pushed to the brink, the limits. You've got nurses that every evening we talk to them, they're not sure if they're going

to be staying another four, eight hours extra because there's nobody coming in behind them. You can just tell by talking to them that they're burned out. And you can see it in their eyes. They're exhausted. They're worn out and they don't know when an end is coming to all this.

Dr. Jill Sellers:

Your background in medicine certainly helped you to identify quickly that something wasn't right with Maddie. What would you tell other parents to look for in regard to RSV?

Tyler Zongker:

With kids, especially one thing that, especially when they get these respiratory illnesses, they initially they compensate very well. They do very well. And so I would always suggest watching them very closely. They can go from being fine one minute to really struggling the next. They developed the fever, the cough and it just progressively gets worse. Look for the belly breathing, look for them using those extra muscles to try to help support them breathing. You can look at their belly. If their belly is going in or out, they're breathing very fast pace. Sometimes they'll get what we call nasal flaring so at their nose just look if they're really drawing hard and you see the edges of their nose are going in and out. That just means they're using a lot of those accessory muscles to breathe. Just make sure you don't ignore these symptoms. You want to make sure you seek care, whether it's your pediatrician's office if they're open, if they're not, it's an evening time, go seek medical care as quickly as you can. Go to urgent care, go to the ER, try to get them evaluated as quickly as possible.

Dr. Jill Sellers:

Good advice. Any final thoughts for the other health professionals that are listening and who may be dealing with RSV patients during this pandemic?

Tyler Zongker:

Yeah, just keep your heads up. This pandemic in general has just been a huge strain on members of the medical community, especially with the current outbreak of COVID and especially in the community that I live. And then now you start throwing in an increase in RSV cases, which is very unusual for the summertime. This is typically a wintertime illness, and then you throw in all these other communicable diseases, it makes it just so much worse. And I just feel, let them all know that, I know you guys are stretched and I know you're burnt out. Keep taking care of your personal mental health, stay on top of that and just know that you are making a difference in people's lives just like my family right now.

Dr. Jill Sellers:

Thank you Tyler, for being here and sharing your story. We wish Maddie a full and speedy recovery and rest for you and your wife.

Tyler Zongker:

Thanks Jill, for having me here today and thank you for the well wishes for myself, my daughter and my family.

Dr. Jill Sellers:

And thank you for listening. In our next episode on RSV, we'll focus on how RSV impacts older adults, the available diagnostic tools and developments on the horizon to protect against the virus. I will be interviewing

Dr. Angela Branch, an infectious disease specialist from the University of Rochester Medical Center in New York and Dr. Jonathan Temte, professor of family medicine and community health and associate dean for public health and community engagement at the University of Wisconsin School of Medicine and Public Health. If you like what you hear on the *On Medical Grounds* podcast, please subscribe, rate and review us. And don't forget to visit OnMedicalGrounds.com for show notes and bonus content.