TWiV 1258 Clinical Update

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Aired 11 October 2025

Vincent Racaniello: *This Week in Virology*, the podcast about viruses, the kind that make you sick.

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From *MicrobeTV,* this is *TWiV. This Week in Virology*, Episode 1260, recorded on October 9, 2025. I'm Vincent Racaniello, and you're listening to the podcast all about viruses. Joining me today from New York, Daniel Griffin.

Daniel Griffin: Hello, everyone.

VR: Daniel, we don't have a bow tie. We have a stethoscope today.

DG I know. I don't know how many of our listeners, viewers have watched *The Pitt*. Did you watch *The Pitt*, Vincent?

VR: No.

DG: I'm going to recommend it. This is a plug. Basically, it's like a redo of *ER,* but so much better. They made some changes, I think, to avoid paying royalties, some absurd level of royalties, I think, they were asked to pay. Noah Wyle is the main star in it. It's really about, basically, the whole show is one shift in the ER. It's really done incredibly well. I'll say it's very kind to the medical profession.

Throwbacks to what we went through with COVID, reminding people of the horrors that everyone seems to have just swept under the rug. Really well done. I'm in my *The Pitt* outfit today. I've got my black scrubs, which usually I wear green or seersucker. Actually, this is a pediatric. I've got my pediatric stethoscope, which I use a bit when I'm overseas because I end up taking care of a lot of children when I'm off in Africa, Panama.

VR: Why is it called *The Pitt*?

DG: Pittsburgh. *The Pitt*. It's a Pittsburgh ER.

VR: It's unfortunate that we need to have ERs, but people get hurt. They get sick.

DG: No, they do. They do. It's important. Tributes to the show. Recommend people.

VR: My dad was a surgeon, and we lived in Patterson, which was a pretty rough city. He'd always be up in the middle of the night going to the ER to get a gunshot wound or a knife stab. He said, over and over, the same thing over and over again.

DG: No, I remember they used to call it the slot at Bellevue. I would do my rotations there

and start off with people getting stabbed. Then when the gunshot wound started coming in, you knew it was about 1:00 in the morning. Oh, my gosh, what horrible things happen to human beings. What horrible things human beings do to other human beings.

All right, let's jump in. I have my quotation here. It's actually from Jane Goodall, who we lost this last week. What a tremendous individual. She's going to live beyond with her quotations, with her impact. Her quotation, "The greatest danger to our future is apathy." So true now. With everything's going on, really critical that we actually pay attention, do what we can.

She has a great legacy. She was a tremendous speaker, tremendous scientist, actually a tremendous human being. There is an article in *Nature News*. Unfortunately, it's behind a paywall. I think stuff like this, they need to somehow just do whatever to get down these paywalls. It does talk about what at least this author suggested were three major contributions by Dr. Goodall.

One was humanizing of primates, which really, I think she did that to her dying day. It really became these are not just subjects that we use to get our answers, but really the primates needed to be treated with dignity. She really was a leader there. Also, she really was a role model for women scientists. She really inspired a lot of women scientists, inspired a lot of us, women or not. She was great when it came to science communication. She would fill a room. Then she really had a great ability to captivate the crowd, to communicate the science.

VR: One thing she did wasn't right. She thought at one point that her colony of chimps had polio.

DG: Oh, tell me.

VR: She had them immunized with polio vaccine. It probably wasn't polio, because chimps really don't get polio very effectively. That's why you don't use them to study polio vaccine. You can't use chimps anymore anyway, but in the old days, you could. They do not get infected very well. It's likely they had something else, but she insisted it was polio, and she had them all immunized. We never found out what it was.

DG: Oh, wow. All right. Also, the Nobel Prize, Vincent. Right up my alley, I was very excited about this. I'm going to put on my glasses here. Mary E. Brunkow, Fred Ramsdell, and Shimon Sakaguchi were awarded the Nobel Prize in Physiology or Medicine 2025 for their groundbreaking discoveries concerning, they say, peripheral immune tolerance. Really, it was this discovery of the T regulatory cell. I did a little bit, probably about half an hour or so on NPR with Brian Lehrer, trying to explain the history of Dr. Sakaguchi, really. I think someone used this, and I borrowed this phrase, swimming against the tide.

Really, this was a time when the concept of T regulatory cells, T suppressor cells, was really just a way to end your career, that there was nothing there. His discoveries, really amazing. I go through talking about how he discovered that there were certain subsets of T cells that actually would rein in. If you got rid of those and just transferred the other ones, it would trigger this autoimmunity. Really tough because mice and humans are really different when these develop. Really, just a lot of hard work to really parse this out. Then when Dr. Brunkow and Dr. Ramsdell figured out the FoxP3, the master regulatory part, and then Sakaguchi comes back in putting that all together, really, it's well deserved.

VR: Daniel, the T cells develop in the thymus. There, they're educated as all the self-reactive ones you're supposed to get rid of, but that doesn't always work. The Tregs do that when you're an adult, right?

DG: The original idea, or the basic concept was the thymus is where all the T cells develop, and then the ones that are auto-reactive we get rid of. We only let the good ones through. That's not 100%, right? We let some of the bad ones get through, so then you have the Treg cells develop. The Treg cells can develop. There's thymic Tregs. There's peripheral Tregs.

In a mouse, it's really interesting that the Tregs start to develop after the normal T cells. If you take out the thymus at just the right time, the mice get autoimmune. If you wait until you get some of the Tregs, it's OK, but human beings, that whole process happens much earlier, probably first trimester, so well before birth, so sort of a complication to figure that all out.

VR: If you remove the thymus from an adult, it wouldn't have an impact on Tregs anymore?

DG: Once you've gotten the Tregs to develop, then you can actually - and they do. Sometimes when they do cardiothoracic surgery, they'll remove the thymus. For our listeners, the thymus sits a little bit below the thyroid, and over time, it does actually go away. Once you get to a certain age, you can actually remove the thymus really without a major impact.

VR: Where will the T cells go? Do they go to the bone marrow and come out of there when they're needed?

DG: The T cells can be distributed throughout the whole body. We have the memory T cells. We have the naive T cells. After you get through that.

VR: Lymphoid organs and so forth. The spleen and lymph nodes.

DG: Exactly, all the lymphoid organs, so bone marrow, spleen, lymph nodes, the gut, right, the gut associated.

VR: Yes, we were talking about this last night on the stream, and someone wanted to know, if you took out a thymus, what would happen? I said, I don't think it matters in an adult, because you've formed all the T cells already.

DG: Yes, and it's interesting. In a human, if you took it out, which I don't know how you would actually do this, and hopefully no one will try this at home, so to speak, but if you took it out in a human being early in development, in utero - OK, not great. Probably once you're born, then by the time you're probably 8 or 9, as we've seen from - This is actually routine when they do cardiac surgery in Japan. They just take the thymus right out, in the way, move it away, toss it, and really not seeing a problem.

VR: I think it's really interesting. Sakaguchi did thymectomies in, I think, rats, and they got autoimmune disease. Then Brunkow and Ramsdell were just sequencing the genome of these scurfy mice, right?

DG: Yes, the scurfy mice.

VR: They had autoimmune disease, and they found FoxP3 mutation. They discovered the

protein, the gene encoding it, and it's so cool. They were working for a company, and the company let them do this.

DG: Yes, it was Celgene. This is a real plug for basic science. They were trying to understand the impacts of radiation exposure. This particular odd mouse, it does not live very long and has these skin and hair abnormalities, and they find this mutation, and then, yes, really unravel this. What hopefully is going to be some amazing translation into therapies.

VR: Yes, because you have conditions where you have high or low Tregs, and maybe in a tumor, you want to have fewer Tregs, let the T cells kill, right?

DG: Exactly.

VR: Then they put FoxP3 into regular T cells, and they become Tregs. It's just amazing.

DG: This is amazing stuff.

VR: Beautiful. This is a good Nobel Prize. I like this very much.

DG: This was well-deserved. There was some question about, are any of the Nobel Prizes political? I was like, "Here, this was very well-deserved. This was excellent."

VR: Tomorrow, they're going to announce the Peace Prize.

DG: OK. Moving on, Vincent. [laughs]

VR: I didn't say any names.

DG: I know. We're going to move on. Maybe we get a little bit political here. I think this is important for us to point out to the listeners because you're always trying to figure out, from whom do I get my science, my medical guidance? There was a really nice news piece in *The New York Times* by Christina Jewett, full of lots of important information. For me, the most interesting is what we learned about how they are letting Aaron Siri's law firm select the ACIP members, the Advisory Committee for Immunization Practices members.

What we read is Dr. Diana Zuckerman, president of the National Center for Health Research, said she was actually interviewed as a potential committee member by Mr. Siri's firm. You have a law firm that is focused on anti-science, anti-vaccine, that is actually interviewing who gets to be at the CDC to recommend against vaccines. She tells us that a senior partner at the law office asked if she would be comfortable saying that decisions on vaccine should be entirely between parents and doctors.

Basically, getting rid of any kind of mandates, getting rid of any kind of recommendation. Just, you know what, this is up between you and the doctors. She interpreted that as seeking her position on doing away with mandates on childhood inoculations. She told the interviewer that you would be harmful and you wouldn't be surprised that they moved on and said, "Listen, if you're not going to do away with childhood vaccine recommendations, then we'll move on to some anti-science person who will."

VR: Daniel, what do you think would happen if all vaccinations were based only between the parents and the doctors, no decision by ACIP or CDC?

DG: The CDC does not mandate. The CDC makes recommendations and it's a guiding body. For decades, people have looked to them to basically have knowledgeable people, people with expertise, dare I use that word, basically give us guidance. What is the risk-benefit? Do you think in general it's good for people to go ahead and do this? Then, at other levels, at a state level, there might be requirements for schools and the rest.

The idea that we're not going to have a national body and a national body that the world has looked to for decades to basically look through the science, parse out what the best decision, what the recommendations need to be. I think that the world is really headed in a bad direction if we're not willing as a government to spend money to really get the best advice, the best guidance for our citizens.

VR: This idea of Siri's firm vetting ACIP members is just unacceptable. There's just no way. This should never be happening.

DG: This should not be happening. True. Ebola in the DRC. I'm going back and forth, back to some good news. We read that the Ebola outbreak in southern Congo shows signs of containment with no new cases. This is a WHO report that we can read about in AP, and I'll leave a link there. As of the fifth of October, and I haven't heard anything to the contrary since, 10 days had passed at that point. No newly reported cases. Potentially, they've really interrupted transmission in the infected areas. Exciting stuff there.

Back to bad news. Measles. Premature baby dies from measles in Alberta, as cases throughout province near 2,000. I'll leave a link into this story. We read that a child born prematurely after the mother contracted measles during pregnancy died shortly after birth. As we've talked about, measles during pregnancy can lead to serious complications, including miscarriage, as we're seeing here, preterm labor and birth, stillbirth, congenital infection. This is not the first child to die up there. This is the second. A similar tragedy occurred in Ontario back in June, when a premature infant died after being born infected with the virus.

VR: I presume that the mother was not vaccinated, right?

DG: That's unfortunately what I think we're seeing here. My quotation, "When you mix politics and science, you get politics. When you mix politics and medicine, you get dead children." We've seen children dying. All right. Right here at home, the DOH issues advisory after measles detection in city of Oswego wastewater. That's a little town upstate in New York. We have one of our state universities up there, SUNY Oswego.

The New York State Department of Health is alerting the public, providers, and local health officials about low levels of measles virus detected in a wastewater sample collected earlier this week from a treatment facility serving parts of the city of Oswego and surrounding areas. The department is issuing a health advisory to area hospitals, health facilities, urging providers to be aware and look for clinical signs and symptoms of measles when examining patients.

I think it's good to get these advisories out there because a lot of practicing physicians have never seen a case of measles. We talk about these. There's this terminology we're talking about, morbilliform rash, a measles-like rash. We used to see three to four million cases of measles a year. You would say, "Oh, this is a rash just like those three to four million measles rashes we're seeing per year." Now, a lot of younger, actually probably the most

clinicians these days practicing have not seen a measles rash. This would almost be a rash that's like something else that you've seen, like a drug reaction, like some sort of other viral exanthem. Really need to alert people to be thinking of measles.

Because the government is shut down, I'm going to start in parallel following the Johns Hopkins U.S. measles tracker, which is actually really nice. Not only do they give us a cumulative, which is a little behind the CDC cumulative, but they also give us regional. We can see where the activity is occurring. They break it down into local cases as well as imported cases. Their number is 1,549. That's up until October 3 Despite the U.S. government being shut down, we actually have an update October 7th. We'll see if we get any more after that, 1,563 confirmed measles cases in the US.

In Canada, another 18 new cases. We're up to 5,024. I wanted to point out, we've been following the U.S. and Canada. Mexico has a lot. There's a nice link I'm going to put in. This is from the CDC. I actually got the information from the WHO where they're looking at the provisional monthly surveillance data reported to the WHO as of September 2025. This data reflects March 2025 to September 2025. Not even the full 2025. If you look through that, Yemen, 19,000. Pakistan, over 13,000. India, over 10,000. Nigeria, over 7,000. Indonesia, over 7,000. Afghanistan, 5,000. Kyrgyzstan, 5,000. Russian Federation, 5,000. Mexico, 4,456. Then we have Canada, the U.S. sort of following down. Becoming an issue throughout the world.

Flu, I didn't actually see that they've updated the pediatric flu deaths from the last year, so that may be part of the government shutdown. We do have some nice science here. We have the article, “Comparison of Two Doses versus One Dose in the First Season Children are Vaccinated Against Influenza A.” This is a systemic review meta-analysis published in *JAMA Network Open*. Now, they point out, and we keep pointing out that influenza causes considerable pediatric morbidity and mortality, 281 deaths last year, children with flu.

An estimated 20% of children are infected each year. That's why we recommend vaccination. Twenty percent, so a good chunk of kids get infected. Children younger than 5 have the highest hospitalization rates for flu of any age group. Just to point there, we say, "Oh, but flu, young, healthy kids, they'll be fine." Actually, children younger than 5, highest hospitalization rate for flu of any age group. Really a target for vaccination. Last year, almost 300 children got sick enough that they died from flu, 281 is the number we have, not updated since about a week ago.

The WHO recommends that influenza vaccine-naive children aged under 9 receive two doses of influenza vaccine at least four weeks apart with one dose each year thereafter. Sort of like a prime and then boost. The American Academy of Pediatrics, AAP, recommends that children aged 6 months through 8 years receive two doses of flu vaccine in the same season if it's their first time getting the shot or if they've not had at least two doses of seasonal flu vaccine previously. You get this going and then after that it's going to be yearly.

That's great and all, but does the research support this two-dose schedule in the first year of vaccination for influenza vaccine-naive children younger than 9? They perform a meta-analysis. They include 51 studies with 415,050 participants to estimate the increase in vaccine effectiveness of a second inactivated influenza vaccine dose. The pooled absolute increase in vaccine effectiveness of a second inactivated influenza vaccine dose in the first year of vaccination was 15 percentage points for those younger than9and 28 percentage points for children younger than 3. Really supporting these recommendations.

VR: What's the endpoint they're measuring here? Disease?

DG: It's basically, let's say medically attended symptomatic flu. As we've talked about, the harder endpoint of ending up in the hospital or the harder endpoint of death, they're not looking at, but we tend to see even more effectiveness there, but you need a much larger study to get those endpoints with the statistics you would need. They have really nice forest plots where you can look through effectiveness. One dose, two dose, differences in vaccine efficacy. We'll leave in a link to that. It's *JAMA Network Open,* so open access, people can take a look at this, but really supporting this recommendation that's been there.

Moving into RSV, no big changes here. We're actually just - we'll watch this. Usually it's at some time in October we start to see some activity down in Florida. With the government shutdown, we'll have to be trying to keep our eyes open for any sort of state-level data there. As we mentioned, now we're nearing to our COVID update, and what is Vincent's favorite part of this whole episode? The multicolor COVID wastewater.

VR: The wastewater.

DG: No.

VR: It's not here.

DG: Sorry, Vincent, the government is closed.

VR: Oh. Yes, I was looking for it because I like to see these trends, and it's gone.

DG: Yes.

VR: That's another thing. The government should never close. That's ridiculous. The government's for the people. It's not supposed to shut down, so get your act together, folks.

DG: Yes. All right, so let's move into COVID active vaccination.

VR: I mean, Daniel, *TWiV* never shuts down.

DG: It's actually true. This is absurd. You and I have not missed a clinical update, what, in well over five years.

VR: No, it runs. The regular *TWiV* runs no matter what, and the government can't get its act together. Trillions of dollars. We don't have trillions of dollars.

DG: Yes. Maybe that's the problem. If we get too many donations, then we'll end up having to shut down, so no. All right. Well, it seems we keep needing to remind folks that pregnancy puts people and their unborn children at high risk for bad outcomes with COVID. Here we have the article, "Neonatal Outcomes Among Pregnant Women with COVID-19: A Systematic Scoping Review and Meta-analysis," published in *BMC Pregnancy*. They're going through with this methodology to summarize the literature regarding neonatal outcomes among pregnant women with COVID-19.

PubMed was searched up to December 2022 to identify observational studies that reported neonatal outcomes among children delivered by mothers diagnosed with COVID-19 during pregnancy. Other outcomes of interest included vertical transmission to neonates, neonatal

ICU admission, neonatal death. Qualitative analysis and meta-analysis were applied to summarize and synthesize the results. Initial selection, 13,387 studies. At the end, 187 were included in this review. Really a lot of high degree of heterogeneity in the epidemiologic study design, sample size, outcomes of interest.

Most studies focused on neonatal outcomes from birth to day 14 rather than the full period. The results of this analysis revealed that maternal COVID-19 infection was associated with the risk of vertical transmission to neonates. We're seeing here this incidence rate of 2.66%, neonatal intensive care unit admission, incident rate there, 16.43, and neonatal death incident rate, 1.29. These risks seem to be increased with the severity of maternal COVID-19. Basically, getting COVID during pregnancy increases the risk of the baby getting COVID, the baby ending up in the ICU, and the risk of the baby dying.

VR: How does this jive with RFK and Bhattacharya and Makary all saying that pregnant women can't get COVID vaccines?

DG: The real challenge, and that's why we keep doing this, is we're sharing the data, we're sharing the information. They're sharing an agenda, and their "agenda", they feel like they know what's right. They feel like they know the answer. They're basically just finding things to support that. As we've talked about for years now, the science, the information, what we know does not support their worldview, their agenda.

VR: Unfortunately, their agenda is going to harm people.

DG: Their agenda is harming people, but hopefully, if we keep sharing the science, and providers, and patients, and friends and family of providers and patients can keep getting the word out, and we can get around this mayhem and harm.

All right. Now, this, we may have talked a little bit about when it first came out, but we finally have the published results of the CANOPY trial. This is the article, Safety, Efficacy of Pemivibart, a Long-acting Monoclonal Antibody for Prevention of Symptomatic COVID-19: Interim Results from a Phase 3 Randomized Clinical Trial." Basically, I'm just going to point out, it works. This is folks getting this passive antibody. They have a group, folks with immunocompromised, everyone gets it. Another group without, where they're going to break down, some get Pemivibart, some get placebo. That's this cohort B.

Basically, what you're going to see is in the cohort B, the folks that got Pemivibart, you're seeing only 1.9% going on to get COVID. If you're looking at placebo, 11.9%, so just multiples there. Really showing a lot of good data here for the benefit of Pemivibart. Not just neutralization data in the lab, but actually seeing patients benefit from the intervention.

VR: Daniel, who is this for?

DG: This is for individuals with significant immunocompromise. This would be a patient who has a kidney transplant. Taking care of a woman with that in the hospital now, or an individual like that. Moving on to COVID, we've got a fun one this time. The article, "Retreatment with Nirmatrelvir/Ritonavir Following Return of COVID-19 Symptoms and SARS-CoV-2 Positivity," was published in *CID.* They use the R word here, Vincent. This is an R-rated study. This was published in *CID*.

These are results of a randomized, double-blind, placebo-controlled clinical trial that

evaluated the efficacy and safety of a second five-day treatment course of nirmatrelvir/ritonavir versus just placebo ritonavir in participants with symptomatic mild or moderate COVID-19 with a positive SARS-CoV-2 rapid antigen test within 14 days of initial nirmatrelvir/ritonavir treatment. This is Paxlovid rebound, Vincent, they're talking about. Oh my gosh. What do you think? Do you think if we give them an extra five days that they're going to have better outcomes? They're going to be all better?

VR: I think that's the question, but what happened?

DG: Let's see. That's a great thing. It's like, this is science. You can put your bets in, but you don't actually know. Let's see. They do the science. They enroll 436 participants. 292 get Paxlovid, 144 get the placebo. The median time to sustain alleviation of all symptoms, all targeted signs and symptoms, was eight versus nine. Not much of a difference there. A second five-day course resulted in a statistically significant reduction in viral RNA levels at day five. The median time to getting two consecutive negative rapid antigen tests was four versus five. We talked about median time to sustained alleviation of all signs and symptoms, eight versus nine.

Basically, what they say is retreatment with Paxlovid was safe, well-tolerated, but there were no occurrences of COVID-19-related hospitalizations or death, and they were not able to demonstrate any significant clinical benefit of extended treatment. My comment is treat your patients, not the numbers, because I feel like that's what they were doing here.

VR: This is showing that this virological increase is not clinically relevant, right?

DG: Yes. Maybe they need to do a bigger study, Vincent, with thousands of people.

VR: OK.

DG: No. People have been thinking about this. People have been doing this. These are studies that need to be done. You don't know the answer until you go and take a look. Here they took a look. They said, "What happens if we give those extra five days? Are we going to end up with a clinical benefit here?" Really not seeing anything.

All right. Moving into the second week, no big changes there. Moving into Long COVID. I'm glad that we have some studies to talk about here. There was a nice presentation this morning, the clinical ID group at Columbia. Magda was talking about a lot of the studies that Lawrence Purpura is doing there at Columbia. We are learning more. This time we have the article, “Long COVID Associated with SARS-CoV-2 Reinfection Among Children and Adolescents in the Omicron Study,” published in *The Lancet Infectious Diseases.*

Here we have the results of a retrospective cohort study that used data from 40 children's hospitals, health institutions in the USA participating in the Researching COVID to Enhance Recovery initiative. That's the RECOVER. Not to be confused with RECOVERY, the great Brit studies. They included patients younger than 21 at the time of cohort entry with documented SARS-CoV-2 infection after January 1, 2022. We're looking at Omicron. They had to have at least one healthcare visit within 24 months to seven days before the first infections. We're getting some background.

The second SARS-CoV-2 infection was confirmed by positive PCR, antigen tests, or a diagnosis of COVID-19 that occurred at least 60 days after the first infection. Second

infections. The primary endpoint was a clinician-documented diagnosis of PASC. That's a post-acute sequelae of COVID. They identified 407,300 of 465,717 eligible children and adolescents with a first infection. Then 12.5% go on to get a second infection during this time period.

The incidence rate of PASC per million people per six months was 903.7 in the first infection group and more than double that, 1,883.7 in the second infection group. Reinfection was associated with significantly increased risk of an overall PASC diagnosis, more than double the risk. They saw a range of symptoms, conditions potentially related to PASC.

Myocarditis from the infection, by the way, folks, changes in taste and smell, thrombophlebitis, thromboembolism, heart disease, acute kidney injury, fluid electrolyte disturbances, generalized pain, arrhythmias, abnormal liver enzymes, chest pain, fatigue, malaise, headache, musculoskeletal pain, abdominal pain, mental ill health, POTS or dysautonomia, cognitive impairment, skin conditions, fever and chills, respiratory signs and symptoms, cardiovascular signs.

A couple of things I want to point out. One is the mean age of these children, 8 years old. These are little kids suffering from that long list. The others, these are children. We are talking about Long COVID in children because people keep, "Oh, why would you bother vaccinating children? That's crazy." Well, look at all these children who got Long COVID with the first infection, twice the number, get it with the second infection. We don't want to minimize the impact of COVID. Look at all these horrible things that are happening to these children.

VR: Do they have any information on whether they were vaccinated or not?

DG: That's the issue. This is a cohort of children that is largely unvaccinated.

VR: OK. As we've talked about before, vaccination does have an impact on Long COVID.

DG: It really does. It's one of the most effective things we can do when it comes to preventing Long COVID.

VR: This is one of the reasons why this Great Barrington Declaration, which said let it rip, was dumb because they had no idea about this. A brand new virus, you don't know what it's going to do in people and you say let it rip, is totally irresponsible. Now we see that you get a lot of Long COVID and that decision is just stupid.

DG: I think that is the challenge. The people who were involved with the Great Barrington Declaration who are now actually in prominent, rewarded roles for that irresponsibility. We have over 1,000 children died from COVID. We have over 100 children died just this last winter from COVID. We see all these thousands of children who are suffering. Yes, this whole idea that, "Oh, it's a brand new virus and I'm going to decide in my head what's going to happen." This is horrible.

We have dead children. We have disabled children. We have over a million dead adults. We have disabled adults who are continuing to suffer. We have ongoing infections, ongoing hospitalizations. Yes, the whole idea that those people should be in positions of power and that they somehow had some great wisdom. The only way that works is you have to actually put your head in the sand and just make believe none of this is happening. None of this

actually happened.

All right. We also have the article, “Prevalence and Duration of Clinical Symptoms of Pediatric Long COVID: Findings from a One-year Prospective Study,” published in *Frontiers in Pediatrics*. These are results from a prospective study that involved 127 unvaccinated children aged 1 month to 18 months with Long COVID. As per the WHO definition, confirmed SARS-CoV-2 infection. They followed these participants at one to three, three to six, six to nine, nine to 12 months post infection. They used this adapted ISARIC Global Pediatric COVID-19 follow-up questionnaire. Really, I think upsetting just how long the COVID is going on in these children.

At three months, 85.8% of the patients were reporting Long COVID. This decreased to 56.1% at nine months, but we still had 32.5%, about a third, still at 12 months. What were these long-term symptoms? About half of the time, it was fatigue. 44%, it was reduced physical activity. About a third of the time, it was headaches. They did find that there were a few features that were associated with a higher risk of decreased physical activity, such as older age and a number of other features that go through.

Younger age was associated with insomnia. Female sex was significantly associated with greater likelihood of lack of energy. Hospitalization status was associated with muscle pain. Overall, 32.5% of all participants continued to experience symptoms of Long COVID more than one year after acute infection. Just pointing out again.

All right. This is going to be our last article, Vincent. Maybe the folks at the Great Barrington got infected with COVID, and that's what's going on. Because we read the article, “COVID-19 Infection Associated with Increased Risk of New Onset Vascular Dementia in Adults 50 Years or Older.” Published in *NPJ Dementia*. They're going to look at new onset dementia, got all these acronyms, NOD. Particularly, they're going to look at vascular dementia, VAD, and they look at Alzheimer's disease, AD.

They observed adults aged 50 and older from the UK Biobank over a median observation period exceeding two years following COVID-19 infection. Incidences of various types of dementia. They're going to look at all-cause dementia, they're going to look at Alzheimer's disease, and they're going to look at vascular dementia. They're going to compare these to match controls without COVID-19 and in individuals that had non-COVID respiratory illnesses. These are important groups. We've got folks that got COVID, folks that didn't get COVID, and then folks that got some other respiratory infection.

Now, they found that the COVID-19 survivors had a higher likelihood of developing NOD, new onset dementia, compared with uninfected controls. This increase was primarily driven by vascular dementia rather than Alzheimer's disease. This is interesting. The risk did not surpass that observed among individuals with non-COVID respiratory illnesses. It seems like just getting a respiratory illness, whether it's influenza, whether it's RSV, whether it's COVID-19, was associated with this increase in vascular dementia. They have some really nice - I really like the figures. We can see over time, this nice separation. About 105% increased risk of vascular dementia. Pretty significant.

VR: It'd be interesting to do a study and look at the impact of vaccination on these dementia, right?

DG: That is the next study, right?

VR: Yes, should be.

DG: All right. Well, we will finish it off. As we've been saying here, no one is safe until everyone is safe. I want everyone to pause right here. We do what we do because of your support. Go to parasiteswithoutborders.com. Click on that Donate button. You can go to *MicrobeTV*, click on their donate button. Every small amount helps. If you go to Parasites Without Borders, right now, we're in the middle of our ASTMNH, American Society of Tropical Medicine and Hygiene, fundraiser. We're hoping to double your donations to get up to the point where we can get a maximum donation to them of $20,000.

VR: It's time for your questions for Daniel. You can send yours to danielatmicrobe.tv. Mary writes, "Hello, Daniel. My name is Mary. I am from Canada. Some time ago, there was a discussion on *TWiV* about a rare and fatal condition after vaccination in children. Not sure if it could happen to adults as well. What's the name of that condition or syndrome? I'm a bit hazy about the details, but apparently there's no way to know a person has this until it's too late."

DG: Do you remember what she's talking about, Vincent?

VR: I do not. I was hoping you would. A rare and fatal condition after vaccination in children. Could that be the MIS-C?

DG: We really don't see that. That's something we see with the infection.

VR: With infection, yes.

DG: Gosh, Mary, I'm stumped here about that.

VR: Anyway, maybe people will write in.

DG: Yes, write in. Let us know if someone remembers, and then we can have a little bit discussion about it.

VR I guess you and I have had COVID, so we're-

DG: Maybe that's what it is. It's that vascular dementia kicking in.

VR: Alex writes, "Kia ora from New Zealand. My local GP has recently notified me that they have no digital history of my MMR vaccination and are offering to jab me. I'm quite certain that I had my childhood doses, but I'm not opposed to getting what would be a booster in my late 30s. Are there any reasons not to get an MMR shot before some probable, and yes, before you ask, unavoidable travel to the U.S. next year where there is now a heightened risk of exposure?" Isn't that terrible, Daniel? Used to have no risk to come to the U.S. with measles, and now there is.

DG: Isn't that crazy? Your travel doctor is telling you, "Hey, you're going to the U.S.. That's a dangerous place. You're going to need this vaccine and that vaccine." It's a low risk. It's reasonable to go ahead and get that MMR shot.

VR: John writes, "A week or two ago, I asked Novavax when/where their shot would be out," and they replied, 'In the fall,' which was disappointingly vague. They should have replied that the site would be up and running, and now it is. Just enter your zip code in the

upper left corner." He provides a link to a Nuvaxovid.com/vaccine/locator.

DG: That's great. This Saturday, it's a family affair. It's my wife and I and our kids. We're all going. We're all going to get our Novavax shots Saturday morning. Exciting stuff.

VR: [sound cut]

“I am a long distance runner and am currently on day six of my third round of covid. This one has been fairly mild, which I'm grateful for. Before the pandemic, the general guidance with regards to sport and illness was as long as symptoms were "above the neck" it was OK to continue exercise, just reduce duration or intensity. Since COVID, I've been more cautious about returning to sport. What are the current guidelines on returning to exercise after a COVID infection, with special consideration for reducing the risk of Long COVID or other possible damage?”

DG: This is a great question. Five years in now, I think we have a little more information. We can give a little more guidance here. I don't think continuing with moderate exercise is unreasonable or associated with any increased risk of harm. As a long-distance runner, you probably have a sense of target heart rate zones. This isn't the time to be pushing yourself up into the anaerobic level. At least for the next week or so, easy workouts, long, slow distance, just keeping your heart rate down in that probably 60% to 70% heart rate zone would be reasonable.

VR: Eli writes, "I am 87. I had my last COVID vaccine in June 2025. Should I get the updated version in December?"

DG: This is really a question that people are wondering about, the gap, the timing between. You want to wait at least three months between your shots. After that, the germinal centers have probably gotten to a good maturation level. The other, we're talking about people getting their shots in October or early November and anticipating a December, January peak. If you wanted to do it early December or late November, I think that's totally reasonable. Don't feel like you've got to be June exactly six months later. There's a little bit of variation there.

VR: For our last email, we have a rant. You're allowed to send it. Suellen writes, "All I wanted was my annual COVID vaccine. In previous years, I just went online to CVS, scheduled the slot, and showed up, proper time and place, but not 2025. In 2025 here in Georgia, our secretary of HHS, the man with a plan and a brain worm, and our governor, who I suspect may also have a brain worm, have decided we need to be protected from those thousands of adverse effects of the so dangerous COVID mRNA vaccine. I have to have a prescription from my physician to get a COVID vaccine.

Lucky for me, I have a primary care physician who does not have a brain worm and who is willing to phone in a prescription. Catch number two was I have to know the exact brand of vaccine, which the CVS pharmacist didn't tell me the first time I asked. It took a total of three phone calls to get that straight. The worst is over, I thought. I know it's Spikevax, and my lovely doctor has phoned in the prescription. Now I'm ready for my appointment.

Then today I get this from CVS, 'Your vaccine is not covered under your insurance.' WTF? I have Medicare. I go to Medicare's site. Medicare says it's covered under Part B. I call CVS. They say it gets rejected when they try and put it through. Maybe DOGE put in a little piece

of code that says if COVID, then reject. Who knows what those chuckleheads did? Now I'm basically unable to get COVID vaccine unless I self-pay about $200, which I can afford, but heck, it's the principle of the thing, right? I'm going to try contacting Medicare down that vast rabbit hole of theirs, but the bottom line is I'm going into the weekend with no COVID vaccine.

Don't I recall Mr. Brainworm saying that those who wanted vaccines would be able to get them? Guess he was on heroin when he said that. Yes, I'm angry. I'm very angry. My husband and I have managed to go five years without either of us getting COVID, or if we did, it was so mild we didn't notice it. If I get COVID and end up in the hospital now, how will that benefit HHS? It will cost more for this 70-year-old to be put on a vent than it would have cost just to have Medicare pay for the vaccine. Sigh, and so it goes in 2025. I can't even imagine what it's going to take for parents to get childhood vaccines for their kids. Thanks for letting me rant. Sue Ellen, your contributor to both Parasites Without Borders and *MicrobeTV* in Roswell, Georgia."

DG: It reminds me of the time that RFK Jr., the man with the brainworm, was up there, and it was a congressional thing, and someone said, because of your decisions, people are going to have trouble getting COVID vaccines. He said, "You're lying." It was like, oh my gosh, but no, this is true.

VR: Thank you, Suellen. That's *TWiV,* weekly clinical update with Dr. Daniel Griffin. Thank you, Daniel.

DG: Oh, thank you, and, everyone, be safe.

[music]

[00:48:51] [END OF AUDIO]