Transcript for Navigating COVID-19 Series
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6:00 – 7:00 pm

Presenters:
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Michael J. Smith, MD, Associate Professor of Pediatrics at Duke University and a member of the Duke Antimicrobial Stewardship and Evaluation Team

Therese Garrett, MD, Medical Director, Behavioral Health, WellCare of North Carolina, Co-Chair of the NC Psychiatric Association's Disaster Committee, and President of the NC Council on Child and Adolescent Psychiatry

Hugh Tilson

Well it's six o'clock. Let's get started. Good evening everybody in this stormy night here, at least it's storming in Raleigh, really appreciate your making time, time to join us for this portion this chapter of our navigating COVID-19 series we're going to focus on clinical considerations for primary care this evening. Next slide. This slide is co sponsored by CCNC, the North Carolina Pediatric Society they're NC Psychiatric Association NC Academy of Family Physicians and NC AHEC. And we're particularly pleased that the North Carolina Medical Society is also a sponsor of tonight's webinar. So thanks for joining us this evening. Tonight is the 11th in a continuing series of informational sessions designed to respond to needs that you have identified as you navigate the COVID-19 process. I want to thank Tom, Elizabeth, Robin, Greg, and Bob for their leadership in identifying those needs and then for their partnership and putting on these webinars to respond to those needs. I'd also like to thank everybody for the work you do every day for your patients for your staff and your communities. We hope the information you get tonight will make navigating these trying times a little bit easier. Next slide please.

My name is Hugh Tilson I'll be moderating this evening. As you can see we have a really distinguished panel of presenters tonight. Dr. David Weber is a professor of medicine pediatrics and Epidemiology UNC associate Chief Medical Officer for UNC Health and Medical Director for UNC hospitals Departments of Hospital Epidemiology. Dr. Mike Smith is an Associate Professor of Pediatrics at Duke University, and a member of the Duke Antimicrobial Stewardship and Evaluation Team, and Therese Garrett is a Medical Director of Behavioral Health for Wellcare of North Carolina is also the co chair of the North Carolina Psychiatric Psychiatric Associations Disaster Committee and President of the North Carolina counsel on Child and Adolescent Psychiatry. Thank you all so so very much for making time in your busy schedules to present to us tonight. Next slide please.

Our presenters have a lot of great information on their slides so we thought that it might be easier for you to follow along if you want to get the slides. You can see there's a link to them at the bottom of our

logistics slide. Kind of to help you navigate that if you go to see communitycarenc.org, there's a blue banner at the top it says learn more about coronavirus. If you click on that, all the way at the bottom there's a webinars for providers link. Click on that and then under July 28, there's the slide decks if you click on that, you can get the slides, let me run through that again. Those slides will be easier for you to follow along. Once we get through their presentations, we will turn to take your questions. There are two ways to submit questions. One is using that q&a feature on the black bar at the bottom of the screen. If you're on the phone, you can't do that because you're muted. The only way you can do that is sending us an email at questionsCOVID19webinar@gmail.com. We will add a recording of this and put that on the website, along with the transcript, probably first thing tomorrow. So thank everybody for making the time and now let me turn it over to Dr. David Weber.

Dr. David Weber

Thank you very much. It's a great pleasure to talk to you today and I want to thank everyone for taking time out from what I know is certainly a busy schedule, particularly at night from potentially spending time with their, their families. I'm at the University of North Carolina Chapel Hill, where I do adult and pediatric infectious diseases and Critical Care Medicine and I serve as the medical director of our infection prevention department and associate chief medical officer. Next slide. So I just want to go over some of the new information I'm not going to go over everything we know about covid. Increasing cases in the US as you all know, in the last four to six weeks and the largest increase is in 18 to 45 year olds I'll show you more about that CDC data suggests that about two to 5% of the population is infected. If we extrapolate that now it's more probably more like five to 10%, the outlier is New York City with 23%, we're not quite sure of the number percentage of asymptomatic infections but studies vary between 20 and 80%. On the other hand, we do know if you become symptomatic about 80% have mild disease and stay home. 15% have to come into the hospital, and another 5% of critical and end up in the intensive care unit. The data suggests that long distance spread over six feet does not occur. And we now have good data on how long people are infected in ambulatory patients this is based on culturing virus, five studies suggest a maximum of 10 days and hospitalized immunocompromised patients, two study suggests a maximum of a little less than, 20 days. Next slide.

We know that viral mutations with increased transmissibility are reported but similar virulence. We have three likely effective therapies from Remdesivir, Dexamethasone, prone ventilation, keeping people on their belly. I will tell you that we will unlikely to have a vaccine this year that we know is safe and effective in randomised trials masks are very effective in preventing transmission when worn by infected persons and preventing acquisition worn by uninfected persons, the covid data is not being sent to CDC anymore but to the US Department of Health and Human Services. And many of us have concerns that this will lead to time delays, lack of transparency and potentially manipulation and the major continued challenge we have is limited testing capacity. Next slide.

Just showing you some of the recent data you can see in Europe, their peak was a little earlier than ours but they have their continued decrease although they're still seeing cases, North America now has more than, meaning the United States really more than 60,000 new cases a day. To put that in perspective Florida is reporting more new cases each day than all of Europe, more than 15 million cases worldwide and the hotspots are the United States Brazil and India. Next slide. The hot spots in the US, sort of the Southwest California, Nevada, Arizona, and the Texas to Georgia particularly Florida, Mississippi and Louisiana, again you can see on the right. We've now plateaued a little bit but when I say plateaued. Keep in mind the plateau is the twice as high as it was at our peaks around April one where we had about 30,000 cases a day. Now we have 60,000 cases a day, deaths trended down but they're going to lag behind this increase in cases, and they're not going to go as high probably because it's mostly younger people, I'll show you getting effective but they are trending upward. Again worldwide more than 16 million cases 650,000 deaths in the US with more than 4 million cases roughly 25% of the world's total. And now more than close to 150,000 deaths, North Carolina, with more than 100,000 cases more than 1600 deaths and over 1000 people hospitalized. Next slide. Now this is some of the US data on the right from left from the CDC and our data here at our own medical center. It shows that back at the earlier parts of the outbreak it was mostly older individuals. 50 to 65 and 65 and older, particularly the older people from nursing homes, what we're seeing in the United States and now and just here in North Carolina is younger people a big surge of 18 to 24 year olds, and a surge also 25 to 49 year old that largely is driven by relaxing restraints in society going to bars, restaurants and other venues where they're not physical distancing and wearing math. Next slide.

Transmission infected individuals droplets that go about 6 feet, airborne transmission has not been described more than six feet or demonstrated, direct contact touching and indirect contact probably plays a role I rub my nose if I'm sick I touch a doorknob someone touches the doorknob and rub their nose, household transmission appears to be the major mode of transmission in China, and the major mode probably in the US. We know presymptomatic transmission is well documented in their infectious. The role for asymptomatic transmission it clearly occurs, but we don't know how infectious those individuals are. Next slide. There we know that the stool, largely does not have virus in it, viable virus and there's no evidence for transmission by stool or urine, transplacental/vertical transmission rare possible cases. And we now know that companion animals cat, dog tigers and minks have been infected they often may develop mild disease, and at least one outbreak on a mink farm of mink to human transmission. Next slide.

This is just shows a nice slide of testing. Notice that the PCR peaks really the values in the first day or two after symptoms appear, which explains why in the pre symptomatic era. People are also highly infectious virus in decreases and usually in most people it's not present by week four antibodies notice can come up on weak one. So you can still have an infectious virus at the time that you have antibody so a positive antibody tests in somebody who's symptomatic does not exclude infectious covid there, the rapid point of care antigen test is only 80% sensitive and has not been validated for testing in asymptomatic people. The current turnaround time for commercial tests running actually now more in the seven to 12 day range because of increased testing demands from sports teams, as well as hotspots like Florida. Next slide.

I should have gone to size one other thing I did want to say is that a negative test today if you do pre procedure testing of someone coming to your clinic, if they're in the incubation period after an exposure does not exclude COVID as long as you're within that 14 day incubation period. This is CDC summary concentrations of SARS Cov RNA, decrease after the onset of symptoms. Patients with a mild to moderate disease only have competent virus for 10 days. Patients with more serious and hospital stays and immunocompromised only have viral viable virus for 10 to 20 days. And this is what leads to the new CDC guidelines which are symptom and time based not test based. Next slide. There are one large study showed that high risk household and hospital contacts didn't develop infection if their exposure to a case patients started 6 more days again, demonstrating that your most infectious early on there. And importantly, recovered patients can have RNA detected in their upper respiratory samples for up to 12 weeks, and but after those time periods, they have not described viable virus, and therefore if someone's asymptomatic and you test them. You can't tell whether they're infectious and that's why you isolate them for at least 10 days and follow CDC guidelines or whether they were in fact had their disease two months ago. Next slide.

Specimens from patients who recovered from their illness and subsequently developed new symptoms to retest -- application virus, and the risk of reinfection is probably lower is lower in the first three months there. And so most of us people have re-develop symptoms in three months would not considered them COVID again at that point in time. And currently six months after the emergence of SARS CoV 2. There are no confirmed cases of SARS CoV2 reinfection. However, we don't know how long that immunity will last. Next slide. Some of the caveats there that the CDC mentions that they did have one person out of 48 infected staff with the nasal pharyngeal swab weekly positive 20 days after the initial diagnosis, but there wasn't shown to be replication competent there. We don't have good data on infectivity from children and infants. We only have limited data on immunocompromised individuals. Next slide.

I just want to show you how the symptoms look and we get an ever expanding list of symptoms fever is only present about 40% when they first develop symptoms, cough and shortness of breath are very common occurring in about another 40% or so the lower respiratory tract symptoms, upper respiratory tract can occur in about 5%. And then you add in Myalgias and others. And you can see here you end up with the majority of people develop children are more likely probably to have nausea and diarrhea, vomiting and diarrhea, we can see that in older individuals profound fatigue and this very unique finding of loss of sense of smell and taste which seems to be quite specific, and an early sign of COVID. Other signs they can have in symptoms are headache myalgia, found fatigue. But, even just Coryza, but just by itself Coryza probably is neither sensitive nor specific. Next slide.

Symptoms began about, on average, four to five days the range is two to 14 days after exposure. Next slide. And then you can see admission to the hospital occurs several days after that, shortness of breath, about day 8 Respiratory Syndrome about day nine and these are that sicker group and then admission to

the ICU about day 10. So you see this set of symptoms and, but again the range of incubation period can be as quick as two, as long as 14 days but the means and medians are in that five to seven day range. Next slide. So again, most people are asymptomatic and we're learning more about that. 80% of those who are symptomatic have mild to moderate disease fever, cough muscle pain nasal congestion sore throat moderate then they move on to symptoms consistent with mild pneumonia, the severe patients have pneumonia, with severe dyspnea and hypoxia, and then the critical have the -- with septic shock, organ failure underlying risk factors, we'll talk more about older age and comorbidities and there are a number of sort of unique features to children, that the next speaker will be talking about. Next slide.

So I do want to point out, this is very important for those of you in primary care. This is just a recent study these are this data is just becoming available. This was a post care assessment of patients who had had covid and they're all hospitalized, you can see the mean age was 56. So, adult adults, length of stay in the hospital is about 13 days, there are a number, 50% had a non invasive ventilation and 5% invasive ventilation, but the meantime for assessment was 60 days from first symptom. Notice 60 days after their first symptom only 13% were completely free of any covid related symptoms. Those included fatigue dyspnea joint pain chest pain. So we need to emphasize to people, not only is their acute disease and this is particularly emphasizing to younger people, but they may go on to have long standing other problems and I certainly have colleagues and patients who months after their COVID and these are people never hospitalized. Still have profound fatigue, weakness, shortness of breath, and loss of sense of smell and taste. Next slide.

I do want to point out again you can see here, the acute phase and the post follow up phase and the amount of time how long things like fatigue dyspnea joint pain and others can can last there so this is a disease that can have long profound adverse events on the health of patients. Next slide. I do want to talk a little bit about the risk factors for COVID in depth. We don't know if these are other risk factors for acquisition, but certainly if you develop and if you are infected. They are for morbidity and mortality, the most impressive one is age I don't know of any other infectious disease with quite this range. So the neutral point here is that age 50. If you're age 50 compared to age 20, you have, as you can see here, roughly 100 fold higher risk of death. And if you're age 100 you have another hundred fold higher with sort of a 10,000 fold range. You notice not surprising cancer, and organ transplants have risks in the, you know, five fold range of death and then many other things including obesity like influenza, but also things like cardiac disease strokes, chronic lung disease, kidney disease gives you a higher risk, but really the key increased risk here is, is age. Next slide.

So in terms of potential therapies, we have the early viral phase which we talked about mild diseases the pulmonary phase, and then the hyper inflammation phase there, therapies we have available here and available many other places, remdesivir certainly and steroids specifically dexamethasone convalescent plasma, which is, we don't have trials published yet on this, but has benefited and other diseases certainly seems safe, being used at UNC were also using high titer monoclonal antibodies, and then things like Tocilizumab to reduce the hyperinflation. These can be done either on an FDA EUA which is how we're using remdesivir, IRB approved research that's how we're using monoclonal

antibodies, other drugs such as the ocilizumab are just off label use. Next slide. And this is really I just want to thank all of you it's really our first responders doctors, nurses and scientists who are really on the front line with this disease and I thank all of you for being on the front line.

Dr. Mike Smith

Okay. Thanks Dr. Weber so my name is Mike Smith, I am a pediatric infectious disease doctor at Duke. I'm the director of our stewardship program and really have been leading our efforts in terms of treatment of acute covid, as well as MISC which I'll tell you a little bit about today, and more importantly I've been on clinical service the last two weeks so have a good sense of what's going on in our hospital right now. Next slide please. So a great overview of covid infection, primarily in adults. So as a pediatric infectious disease doctor for those of you take care of kids, to give you a sense of kind of what's going on in the pediatric landscape. And, and certainly children are are affected by this pandemic due to schools being closed and other social situations, but from an infectious standpoint, they do seem to do much better than than adults. So compared to those numbers that you just heard about. Since the pandemic has started there's been just under 300,000 cases of children. That's you, younger than 18 accounted for about eight and a half percent of cases across the country and population rates of 380 cases per 100,000 children. If you look at hospitalizations, it's even less than that children account for depending on which state you look at anywhere from 0.8 to just under 3% of all hospitalizations, and the flipside is, if a child does test positive for covid 0.6 to 9% of children who test positive result in hospitalization, but there's definitely some, some bias in that estimate because you're much more likely to be tested, if you're already hospitalized. I think particularly reassuring for us in pediatrics, is that there has not been significant mortality from this disease in kids. Children risk are accounted for less than 1% of all Covid deaths and less than 0.3% of all cases, result in death. Next slide.

And this just goes to show that, I think we're learning more about children as we test more. So looking back the last couple of months, these are data from initially 46 states and now the last month or so 49 states. You can see that the percent of children of the total cases has increased from from 2% back in April, up to, up to the 8.4% I already mentioned. And this really I think is due to the fact that children are much more likely to be asymptomatic, and they were not tested earlier in the pandemic. Next slide I showed you the national estimates earlier how are we doing here in North Carolina. So, you can see that we're a little bit higher than average with 11% of cases being in children less than 18 slightly higher population levels of 504 per hundred thousand children. We don't, or I couldn't find easily at least hospitalizations by age in North Carolina. But again, also reassuringly that we've had one COVID related death in the state so our the percentage of COVID cases in North Carolina that the result in death is actually zero, which kind of goes along with what I was saying earlier. Next slide.

What's perhaps a little more concerning for us in pediatrics, is this post infectious -- a couple slides earlier that show that in adults, you often get hospitalized with acute respiratory symptoms and quickly progressed to either a RDS or a hyper inflammatory state. And that's much less common on the pediatric side. And it suggests that there, the response to this particular pathogen is different in children

than it is in adults. What we see more on the pediatric side is a clear, a clear post infectious process that's been called multi system inflammatory syndrome in children. And this was first reported in, in Europe. And then in New York with peaks of approximately three to four weeks after the high peaks in acute respiratory symptoms. And that's why it's felt that this is the post infectious complication. So I have a pure, the CDC case definition. So the CDC definition really for surveillance purposes, is that MISC is defined as occurring in an individual who's, less than 21 years, presenting with fever lab evidence of inflammation and lots of ways you can do that but it's typically white count CRP, Ferritin, D-dimers evidence of clinically severe illness requiring hospitalization, with multi system organ involvement, and really there are two main systems in the majority of cases, though, first of all, this is primarily GI, as Dr. Weber mentioned earlier, significant abdominal pain, some diarrhea sometimes vomiting, and then perhaps more worrisome is the cardiac manifestation, with really myocardial dysfunction. You also could have no alternative plausible diagnosis. And again, for the case purposes proof, either through positive PCR or positive antibody testing or known exposure within the four weeks part of the onset of symptoms to covid. I will say again going at the idea of this is likely postinfectious. Most kids do have an antibody test, if you look, a positive antibody test if you look at cases in New York, as well as Europe about 85% of children had positive antibody testing, only about 15% had positive PCR testing but as you heard earlier, you can test positive via PCR for four weeks, a month. Next slide.

The reason I mentioned this here for people who primarily do not work in hospitals, is the definition here for the case definition of fever is temperature greater than 38.0 for more than 24 hours, or report of a subjective fever lasting more than 24 hours so if you're out in primary care, and you worry about this particular diagnosis. Once winter respiratory season starts, this is going to be like every patient in your practice. So, remember this is a case definition for surveillance purposes in clinical practice what we're doing in our outpatient clinics system is really focusing on the symptoms. So we worry if you have diarrhea and abdominal pain. The fever in and of itself, we tend not to worry unless it's been going on for a couple of days, typically three days we chose instead of one. And in the era of telemedicine decided that you do telemedicine visit if they're well, appearing probably just some supportive care at home or work. If they're moderately ill appearing. That's when we consider bring them in for an actual physical exam in the office and or lab evaluation such as a CBC and a CRP. Again, this MISC is a really hyper inflammatory state, and between your white count and your CRP, those are elevated to strongly consider actually bringing that patient in to be to be evaluated in the emergency department. And of course if they're ill appearing just send them right to the emergency department. I will say in the United States despite a lot of concern about this, and you can go to the next side while I'm talking. There haven't been that many cases in the two months or so that we've known about this there's been 340 pieces. And you can see the distribution across the United States majority of cases have been in the northeast, New York, Massachusetts, New Jersey. Next slide.

And what's important to note here is that the racial and ethnic disparities that we see with acute infection are mirrored here with MISC. We just haven't seen enough of these to know if children of Hispanic ethnicity who account for almost 40% of all cases, or non Hispanic black children who account for 30 of cases, if they're actually have a greater predictive predisposition to MISC, or if that just reflects the epidemiology of acute covid infection, there's some evidence to suggest both ways and time will tell.

The other thing to note is that the average age for this. You can see the distribution there on the bottom left is about -- see in other --.

Next slide. So putting this together you have something that for the most part, does not cause significant disease in kids. Very few children get admitted to the hospital with acute COVID. And again, although MISC is something you should be concerned about it is also very rare with only 342 cases reported. So as we move towards the end of the summer and schools reopen. And I understand that it's a very complicated decision and many of you on the call I'm sure are working with the state in the school system to figure out if schools are going to open, I'm not going to so much get into that. But as physicians who take care of children. I'd say in the last seven to 10 days our office has been inundated with this question, not so much should school open but hey, my child's school is opening. Do you think I should go back. And I do think primary care physicians are perfectly positioned to help sort this out, and at least point parents in the right direction to get some resources and perhaps give some, some medical tips. So the way that our group at Duke has been thinking about this is there's really two things to consider. One is, what's the likelihood of acquiring infection. If you look at other pandemics like H1N1 when schools were closed kids just went to the mall and got sick anyway so school may in fact be a safer choice in terms of use transmission, depending on what mitigation strategy, your school or school district is using the other important question to consider is for a given patient, if they do get infected, what is the likelihood of severe disease and Dr. Weber talked about some of the some of the factors in adults that have been associated with severe disease for us in pediatric infectious diseases, we're really recommending that are highly immunocompromised kids. So our HIV patients who have poorly controlled virus, our bone marrow and solid organ transplant patients or chemotherapy patients that they do remote learning, but for children. Again, that the data are not as strong as they are on the adult side for, particularly if they're well controlled chronic diseases like asthma, diabetes, or obesity. We do think that it's probably safe to go back to school, especially for the younger kids. There are some data that show that if you're if you're less than 10. You're not a particularly effective disease spreader as you get into older adolescents and high school students, it does get a little bit more questionable in terms of the ability to transmit disease. And then finally, when you're making this decision. Of course it depends on kind of your family background. If you have grandparents who have at your at your home again you've heard that the older you are, the more likely you are to develop severe covid, that might be reason to stay at home. And really, if, if mom or dad or other household members have any chronic disease, put them at increased risk.

Next slide. So getting at this likelihood of infection, just want to point out, and I'm sure many have seen this already on the north carolina of DHHS dashboard, there is an outbreaks and clusters page. So there you see the map of the state and if you're in one of those dark areas well probably your school is not going to be open anyway so maybe a moot point. But if you're in an area where there's lots of outbreaks. I would probably urge you to not recommend that your patients go back to school. The other thing that that our group is working on and trying to figure out is, You know what are really the best metrics for for safely reopening schools because children do have different risk factors than the rest of the society and if you move kind of from phase two to phase three those same criteria may not apply to children. So I am excited that on this web on this website. You can see that DHHS has added a section on

childcare in school settings and clusters, so you can look specifically in schools and childcare settings, how many outbreaks have there been. And I think that that really is the best way for us to know across the state how we're doing with children coming back together in congregate settings.

Next slide. And here this is actually from last week's report if you click on that also show you the county, the name of the facility and the number of staff and children that were infected again fortunately no deaths here. And if you look quickly down this list. The majority of cases, except for one outlier there have been on the staff side, which just kind of -- for us, and great for us as parents and grandparents that children do seem to do better with this particular infection than adults do. Okay. Next slide. And then, finally, in closing, I had a couple. I had a couple of, sorry about that guys, I'm using my headset and I got a phone call. I had a couple of questions before this talk. From the primary care settings just want to touch on real quickly. So one question was if you are seeing a child, especially a newborn who's born to a covid, positive parent or caretaker. How should you bring that child back what safety should be a place for that kind of that first week visit if necessary. And I all I can tell you is the way that we're handling with our outpatient practices which is, if the child is otherwise well, you can you can try to push that visit back to the period when the parents are no longer contagious. If that's not possible. Another option is to have the parents stay at home and have a non household contact bring the patient in and again, we've all gotten much better at telemedicine these days and communicate with the parents that way. And of course if it's absolutely necessary that the patient comes in, you can do something like, have them come in at the end of the day, use a dedicated exam room that no one else is going to be in that day, and use appropriate PPE.

Another question that I got ahead of talks about reinfection I think Dr. Webber really discussed that already, that the CDC kind of uses 90 days, as, as the period where if you have a positive test, you can expect it to last for that long. And then finally, testing strategies for office staff and healthcare workers and the utility of rapid test that remember I talked about this as well. I think they're better I think, rapid the rapid PSC tests are probably better than nothing but they're only about 80% sensitive. Next slide. And what I want to point out here is that this is just one of several papers, the most recent one. Again, this was new, a while ago it's probably even not even new anymore, but this is data from from from Massachusetts where you look at the impact of positivity rate in healthcare workers, really was not impacted as much by Universal masking of health care workers as it was by Universal masking for patients. -- I think if you mask yourself as a health care worker, and you mask your patients, that is probably the most effective way to dispense commission from patients and health, and just anecdotally the cases that I've heard of workers getting infected. It's more been from each other than patients. So I'm going to stop there and and happy to answer any questions during the session later.

Dr. Therese Garrett

Hello. Welcome. Thank you for coming. I'm Therese Garrett I'm going to be speaking about psychiatric and behavioral health consequences of coronavirus infections I'm the behavioral health Medical Director for wellcare of North Carolina, the Co-Chair for the North Carolina Psychiatric Association

disaster committee and the president of the Council on Child and Adolescent Psychiatry. Next slide. So, obviously, COVID-19 has only been with us for a number of months. And so when we're looking at some of the psychiatric consequences much of what we're looking at is looking at other coronavirus infections. So, there was a large meta analysis. Looking at consequences of coronavirus infections, which did include some COVID-19 but also included a lot from SARS as well as MERS and found that in the acute setting a little more than a quarter experienced delirium and confusion at that time as well as some depressive or anxiety symptoms and mania full blown mania or psychosis was only seen in a small minority of patients. When this article first came out, and they were talking about it largely being secondary to exogenous corticosteroids at that point dexamethasone wasn't really being used so there was a lot of conversation about oh hopefully we won't see this with COVID-19, some of that has shifted as dexamethasone and other steroids have become more popular and more useful. And then, despite full mania and psychosis not being seen there are frequent symptoms of sub threshold mania including mood lability irritability and euphoria, when we're looking at longer term oftentimes, many of those things are on the cognitive realm with impaired concentration memory sleep disorders or fatigue mood lability as well as frequent traumatic memory recall. When they also sort of looked at where do some of the psychiatric disorders, fall, they found high point prevalences of anxiety, depression and trauma related disorders. However, it's hard to tease apart what of that is related to individuals having been infected with the coronavirus infections and what of that is related to the effect of the pandemic on the population as a whole, they were not able to tease some of that out. While all of these so far have been many of the negative things there also have been seemed to be positive effects in terms of resilience in terms of personal growth through adversity. And this is been additionally seen with health care workers both who have been infected with COVID or ones that are sort of working in COVID settings.

Next slide. A more recent study coming out of the United Kingdom gathered information across the country from individuals that had any neurologic consequences, and they looked at around 150 patients, and of those patients, they found that it was about 60% had cerebrovascular accidents with 31% having an altered mental status and then other was this kind of clump together of the remainder, with the individuals that had a CVA the majority of those were ischemic strokes. And then when they sort of looked in teased out some of the information within altered mental status, the largest percentage was individuals with neurocognitive syndromes, that looked like a dementia type picture or new and onset psychosis, there were a smaller number of individuals with affective disorders. And what was notable with this is that the vast majority of these individuals were not people who had had pre existing dementia or psychotic disorders. There have also been a number of case reports of Guillain-Barre, myelitis, encephalopathies as well as post viral syndrome resembling depression, and then as Dr. Smith spoke about with MISC altered mental status and seizures and children.

Next slide. So, when we've looked at in many of these studies, what are some of the etiologies of neuropsychiatric consequences I think initially there was a lot of concern about direct effects around about it being potential brain infections, but in the studies that they've looked out and gathered some information or gathered measurements from CSF they haven't found the virus as much in there so at this point the belief is that much of it is related to immunologic responses, as well as some of these other aspects such as the degree of physical physiological compromised from hypoxia or medical

interventions including mechanical ventilation, medication, side effects. And then some of the psychological impacts such, including isolation, stigma, concern and fears about infecting others as well as sort of having a novel illness with unclear and uncertain course which we're learning more about but is still very frightening to people. Next slide.

So, one of the things that that individuals are using to attempt to extrapolate what we might see with coronavirus is looking at what we see in general with critical illnesses and when they looked at sort of what are some of the longer term mental health impacts of a critical illness in general not not specific to COVID-19. At one year there's a high incidence of depression, anxiety and PTSD symptoms with higher rates of challenges with individuals who have had ARDS with acute consequences of agitation confusion as well as some cortical spinal tract signs, and then longer term symptoms with the majority at a year, showing ongoing cognitive impairments through processing speed impaired memory, attention and concentration. And one of the notable things in looking at ICU admissions is that individuals who are hospitalized in the ICU for ARDS had a greater reduction in quality of life than individuals in ICU for other causes. And then, the steroid induced mania and psychosis is something that we're beginning to see more of as dexamethasone is becoming more utilized. And then there are more cases coming out with looking at cognitive decline, or acceleration of dementia and there's not. I think there hasn't been enough time to really see what, where is that going across time and what are we going to see longer moving forward.

Next slide. There was a study in China, that was looking at and this is not for COVID patients specifically, but this was a case control study so it is different than many of the other studies in looking at individuals who had preexisting psychiatric illness or not. And the cases were all individuals who either had single episode or recurrent episode of major depression or one of the anxiety disorders, not including bipolar or psychotic disorders and not including children. And what they found is that the incidence of significant PTSD symptoms in psychiatric patients was higher than those in controls, with about a quarter of the psychiatry psychiatric patients reporting high levels of anxiety depression and insomnia and individuals who had physical symptoms, independent of whether they were diagnosed with covid or had symptoms, specifically that could be associated with COVID, were more likely to report psychiatric symptoms. Then, other things that are that are not coming out of The China Study but we are beginning to see more with some of our psychiatric patients. Here is the incorporation of fears and concerns around COVID into delusional systems of individuals with psychotic disorders and schizophrenia.

Dr. Therese Garrett

For folks who whose anxiety or level of obsessions is out of proportion of course it's hard to say exactly what is out of proportion. You know when when we're sort of looking across the population because all of us have different risk tolerances and fears, but you know one case that that I was dealing with was a woman who was so afraid of COVID that she wouldn't go into her house, despite the fact that no one else lived in her house she had a fear of getting COVID and so she was actually sleeping on the porch.

And so that's, I think what we're talking about. And all of this is getting incorporated into individuals anxieties and psychotic episodes.

Next slide. I have a few things here in terms of the impact of covid on family of covid patients and there's so many more things in this and I just included a few for people to keep it in their mind I think one of the biggest thing that I'm sure all of you have encountered or have been dealing with, are some of the traumas and difficulties related to separation and inability to be with loved ones and that can be for individuals who are in the hospital with COVID that can also be for individuals who may be in nursing homes for non COVID related things but are unable to have family visit because of the covid pandemic or individuals who are in hospice who also are not able to see their family and loved ones. Because of these impact on visitations and people in hospitals and people and doctor's appointments. All of this has led to delays and difficulties in communications with health care providers because all of the conversations with family members are often now happening on the phone or video, some of which was happening before but in the past in hospitals and in doctor's office. Many of us were able to meet with family members there and how the communications more directly. I believe Dr. -- has spoken about some of the this next piece on prior presentations in terms of death and grieving and the disruption of the grieving process. Some of the challenges around saying goodbye or not being able to say goodbye if someone is in the hospital and dying of COVID or someone is infected with COVID and unable to go visit relative who's dying. The alteration and grieving rituals from individuals either not having funerals at all to having virtual memorial services to having virtual visitations and how different that is from the typical process that we see, and how this is increasing some of the risk of complicated grief as well as anxiety and depressive disorders. Additionally, some other impacts on families can be some of the stigmatization by others, or if an individual in the family was infected with covid and feels like they're responsible for their family member who is ill and or dying of COVID guilt about being a vector of infection. And then this last piece Dr. Smith already talked about in terms of the challenges with COVID positive mothers and newborns and the decision about separation versus rooming in during the hospital, as well as impact on post hospital newborn care.

Next slide. This is probably outdated now as is much everything but Express Scripts looked at prescriptions during the early portion of covid and what they found in the months between mid February and mid March was a dramatic increase in anti anxiety prescriptions and a significant increase in prescriptions of medications for depression, and sleep. And what was notable about this is that the majority of these prescriptions were new prescriptions not for individuals that had previously or recently been on medication for depression, anxiety or sleep. The other piece of this that's significant is that this is a reverse of a multi year decline in the use of benzodiazepines and some of the Z drugs for insomnia. You can also see though, there had been across the past four years, an increase in antidepressants but we had seen a 15% increase in a four year process, and then we saw that, you know, same slightly bigger increase, just in a month long period, there's not more recent data than this that I've seen, but it was pretty notable from what I found.

Next slide. And then lastly I haven't really talked about the healthcare worker piece I know it's been talked about a lot, but I thought that this was a really good article that consolidated a lot of information anxieties from healthcare professionals in terms of what individuals need. And while I think this is relevant to what healthcare professionals need I also think this is relevant to what individuals in the community and society need and it really sort of all distilled down to five main things, hear me, protect me, prepare me, support me and care for me, and that that's really what people are looking for.

Before I end and we move on to questions I did want to answer one of the questions in here. That was what is your response to parents asking for a note excusing the child from wearing a mask to school. This is coming up a lot both for adults and for children in the psychiatric realm in terms of anxiety disorders in terms of all sorts of things. And one of the things that I think that we can talk with individuals about is are there ways if the concern is around anxiety are there ways that we can talk with folks about sort of graduated exposure to deal with the anxiety in terms of practicing wearing a mask and in smaller settings and kind of grow spent growing the amount of time. There are a couple of exceptions in which I think it would be a much more complex discussion. So far I have not actually written an excuse for anybody to not wear a mask. But I think the places where it does get really difficult in terms of individuals wearing masks are for some individuals with cognitive neurocognitive impairments with dementia I know this has been an issue in terms of getting individuals back in the nursing homes because they've been unable to comply with what they need to in order to protect the staff and other patients there, but also with individuals with developmental disabilities or autism some it may be much harder to do some of that teaching around mask wearing. And then another case that I had heard about that I think is a really complicated one was actually somebody who was wanting to be more comfortable with wearing a mask, but was really frightened and terrified because her traumatic exposure had been one in which she you know she had been sexually abusedand her and her face had been covered and the person had been wearing a mask and so she was triggered by being out and about and seeing other people wearing masks but also by herself wearing a mask, but was interested and willing to work on that. So, if it comes from a place of anxiety or trauma, are we able to sort of work with folks on trauma informed responses around that.

And next slide. And that's all I have. And this is just kind of a picture of where it feels like all of us are right now we're all the little worms downstairs and it's kind of hard to figure out what's what's being said at different times and the experts are saying it's safe to go out again. Thank you so much.

Hugh Tilson

Thank you so much. what a great panel a great presentation. I got a couple questions but I want to tag on to the What's your response to parents asking for a note excusing a child from wearing a mask to school and see if anybody else has any comments, they want to add to that.

Dr. Mike Smith

Yeah, I will say I guess the nice thing about being a sub specialist is I haven't had that question yet. I would, I think I would try to have a discussion about, you know, the, the reason for that and is there a, you know, this reminds me a lot of kind of vaccine exemptions, is there a true medical reason why a child would be safe to wear a mask and I think you'd have to take that on a case by case basis, but I would try to talk people out of that if I, you know, if it were safe.

Dr. David Weber

This is David Weber from an infection control standpoint, that little bit depends on what the teacher or the healthcare provider is doing if a person is not wearing a mask, and the other person is wearing both masks and eye protection, then they would be protected. But if they're only wearing a mask and another person is not and if the person not wearing the mask has covid either a symptomatic presymptomatic or symptomatic, the CDC would consider that an exposure that person would be isolated or quarantined for two weeks and there would be some risk of acquiring covid in those cases. So again, ideally you would want to, again, that's if they're within six feet of distance if they're greater than six feet there would not be an exposure.

Hugh Tilson

Really helpful. So somebody sent this in the Gmail. Can you ask the panelists the following question, what one thing would you be concerned about in the primary care setting for someone who has been hospitalized for COVID-19 and you're now caring for.

Dr. David Weber

So let me start with that CDC has a new guideline I, we didn't go over the depth but it's a time symptom based situation if someone said COVID, and they've been an ambulatory person, 10 days after their onset of symptoms, 24 hours afebrile and improved symptoms, not absent symptoms, they would no longer be considered infectious and you would need no special precautions. If they are in the hospital that 20 days with again improved symptoms. And if they were hospitalized and afebrile for 24 hours off anti pyretic so if it's remote then there is not a risk of transmission.

Dr. Mike Smith

And this is Mike Smith, you know, on the pediatric side we just haven't had that many pediatric hospitalizations for COVID. I will say based on the MISC. Someone had put it in the in the in the question and answer box to. It is similar to Kawasaki so probably the most important thing, if you have to a patient a child who was admitted with MISC or, or an MISC like syndrome, following up with cardiology and making sure you get those echos to make sure that their, their heart function. The heart is still pumping well and there's no aneurisms would be the thing to worry about. And actually, I'll just take that segue because there are a couple of questions about about about Kawasaki too. So the seasonality of MISC, I, I just think it's too early to know. I think if MISC does not sorry and for those who can't see

there was a question about seasonality. That Kawasaki disease is seasonal and could MISC also be seasonal. I just think it's too early to know. Given the cases, increasing in the south now. I think in the next month or so we will know because remember, it's a good three to four weeks after the peak and respiratory illness when you start to see MISC cases so I think time will tell. That one.

Hugh Tilson

So how about this. Okay, Tom.

Dr. Tom Wroth

But I was just gonna jump in and and put a twist on that question Hugh I think some of the, the questions we've gotten from, especially the adult primary care docs says, so this might be to you David is, you know, so looking at prolong fatigue, looking at pulmonary sequelae looking at you know even thrombosis and renal sequelae other things are there other sort of organ specific or disease specific issues that we should be looking at when we see a hospital follow up patient.

Dr. David Weber

First both for initial presentations and for follow up. This is a different than other respiratory viruses the cytochromes storm and potentially even virus do cause a multi system disease so we've seen patients majority present with the symptoms I've said, we have seen patients occasionally present with what looks like an acute abdomen. Patients present with primarily cardiac issues, arrhythmias or a mycarditis like picture, and occasionally present with neurologic findings that mimic encephalopathy or matriculitis, or even seizures. And of course the loss of sense of smell and taste is neurologic. So you have to be aware of that. We don't have a lot of evidence what people leave with. But impaired cognition, long standing respiratory problems, the renal failure that can occur can occur a week after their lungs are already recovering and may leave them with permanently long standing renal difficulties. Patients have developed late neurologic difficulties and we've actually had patients whose lungs have recovered, but died in neurologic death. So it's a little early to say but I think we do need to be prepared for substantial end organ problems, particularly in the sick hospitalized patient with long term sequelae that involve neurologic syndromes cardiac pulmonary renal to at least name those major organ systems, how whether those are resolved and what specific forms they take. I don't think they really know, but maybe my pediatric colleague would like to comment on concerns about Miopericarditis about children who are undergoing a strenuous sports and the need potentially before allowing them to do that. Who have had covid about getting cardiac ultrasound.

Dr. Mike Smith

Yeah, so, you know, again, we are certainly recommending that for kids who come in with this MISC like condition, I think, because children are otherwise getting out of the hospital with COVID, there's no, there's really no clear consistent recommendation that you know echo or EKG should be part, you know,

part of the workup I think most kids. My impression is that most children who have acute covid infection, never come into the hospital. And one of the reasons that that I think that is, as I mentioned, I've been on call the last two weeks. And I'd say, maybe we had 10 children tested positive for covid. One of one of them actually was a was an infant, with bronchiolitis and and did receive a course of the remdesivir and the Dr. Weber mentioned, everyone else was asymptomatic. It was, you know, children who came in, for instance for surgery, who had their pre op screening tested positive, we went and looked at them absolutely no respiratory symptoms, some of them didn't even have a fever. So, we're probably going to learn more about this disease and children and whether or not we need to be more aggressive but but right now there's really no evidence that that children need some kind of additional workup just because they they've had a covid infection, again, time may tell them that may change but it doesn't appear that those children are increased risk.

Dr. Tom Wroth

Great, thanks Mike and David. Switching gears a little bit there's a question in the question box about any information on the use of high dose melatonin zinc and vitamin C in symptomatic ambulatory patients, especially kids. This person heard from a colleague in Texas, using those combinations successfully.

Dr. Mike Smith

Yes, I've not seen any data to suggest that that that makes much of a difference. And again, I think just based on you know what I just said that the majority of children are probably asymptomatic, the ones who are symptomatic seem to be for a short period of time, and get better on their own that that my inclination and the way that I've been doing this in my own practice is to is to really not any not offer any -- could it help, perhaps, but I don't have any data to support that.

Dr. Tom Wroth

Great David any or Therese any other

Dr. David Weber

No again you know, zinc and vitamin C and those they have some mild role in preventing disease but there really is no role for them in treatment and as long as you stay within the safety limits is no harm probably in taking them prophylactically but there's no evidence for benefit.

Dr. Therese Garrett

I wanted to go back to the you know what to be looking for in folks as they're they're coming back to the primary care setting, I would say for adults that have any history of mild cognitive impairment or early

dementia, it might be worth sort of re doing sort of a basic screening cognitive exam on them to see where they stand in comparison to where they stood beforehand because the individuals that we've seen that have been coming into the hospital with worsening of neurocognitive, it's been sort of after they've recovered and been back out in the community and then have had a significant decline, as well as, you know, being aware of some of the, you know, longer term trauma related symptoms as far as PTSD or depression, especially for folks that have been mechanically ventilated or had ARDS I think really being aware of that perspective. And then I would say lastly being aware in particular with individuals on steroids kind of keeping an eye out for any significant change that that might be mania or psychosis secondary to that.

Dr. Tom Wroth

Great. Thanks, Teresa I would love to just get to one last question I know we're coming to the top of the hour but just comments on the upcoming flu season so what measures are you putting into place to prepare for the outpatient flu season, and what are we doing differently this year.

Dr. David Weber

Please. First thing is obviously everyone should get their flu shots CDC says, essentially, if you're over six months of age and breathing, unless you've had anaphylaxis you should get a flu shot. So, you know, certainly there will be some people with coexisting viral infections at the same time. We don't, one suspects they will do worse than if they have either one alone so that's the first thing. Plus it certainly will complicate their life if they have to go get tested for COVID but they ended up having influenza, and the vaccine is going to be available early this year meaning probably mid to late August, so I certainly encourage that. The big problem will be obviously the number of people coming into emergency rooms with viral respiratory illnesses will be up not only because of flu obviously but RSC and other diseases. And it's not clear to me that we will have enough testing capability, but to test all of those people for COVID and with that increased need hopefully we will, but it's certainly going to complicate our emergency departments on our hospitals. If we can't and we don't have rapid meaning within an hour test that allow us to detect those diseases. And we have to wait hours to a few days to treat all of those people as coded so it's going to make the job of primary care physicians, ED, hospitals all of us just much more complicated.

Dr. Tom Wroth

Testing is going to be key.

Dr. Mike Smith

Yeah it is. And just to add to that, you know, I'm, I'm actually more worried about as a pediatrician I'm more worried about influenza than about COVID you know i just showed a lots of data shows that that kids tend to do well from COVID are not really implicated in transmission. It's completely opposite for

for influenza where children do play a huge role in transmitting influenza. And I think, you know, the school season is probably going to be more difficult to navigate in flu season than from COVID in of itself. This is also something that you know that we struggle with. And, you know, as it's already said limited the testing is important. The best way to do that is unclear to me. Perhaps you know going back to respiratory care centers where you can get kind of tested for all these things at the same time is going to be the way to go. If we can have the manpower or the testing capability to do that.

Dr. Tom Wroth

Great, thank you so much Hugh, will you wrap this up.

Hugh Tilson

Absolutely. So first of all, Therese, Mike and David, thank you all so very much for just an incredibly informative presentation, making the time in your very busy schedules to do this we really really appreciate it. For those of you who participated I hope that this information was helpful to you as you figure out how to navigate COVID in the primary care setting. Tom and Greg and Elizabeth and Robin thank you and Bob thank you so much for your partnership and setting this up I really do appreciate it and hope everybody has a great evening and stays safe, and we look forward to talking to you again soon. Tom anything you want to add.

Dr. Tom Wroth

No Just want to thank you all as well.

Hugh Tilson

Great. Thanks, everybody.