COVID-19 Updates: Maintaining Good Health Through COPD Management
May 21, 2020 Webinar
Transcript

Jamie Sullivan:

Good afternoon, everyone. Welcome to today's webinar, which is titled, *COVID-19 Updates: Maintaining Good Health Through COPD Management.* Welcome back to those who have joined us for these regular updates. If this is your first time you're joining in, we're so glad you found us. Before we get started, I'd like to go over a few items, so you know how to participate in today's event. [housekeeping instructions] Before we kick off with the formal program, I would like to introduce Corinne Costa Davis, the COPD Foundation CEO, to provide opening remarks.

Corinne Costa Davis:

Thanks, Jamie. Appreciate it and good afternoon, everyone. Thank you so much for joining. We have a jam-packed discussion today, so I just want to take a few moments to thank everyone for their participation, especially Jamie Sullivan, Stephanie Williams, Dr. Byron Thomashow, and Dr. MeiLan Han, who will be presenting in today's conversation and also to let everyone know how grateful we are for the ongoing support to our corporate partners, who generously contributed to our ability to respond to COVID-19, including Theravance Biopharma for their support of our webinar series. So, with that, enjoy the conversation. Jamie, I turn it back to you. Thank you.

Jamie Sullivan:

Great. Thank you so much, Corinne. Once again, welcome. So, my name is Jamie Sullivan. I'm the VP of Public Affairs here at the COPD Foundation. I will serve as your host today. But to start, as usual, I'd like to remind everyone that the information presented on this webinar should not serve as a substitute for medical advice and any of the content discussed should not be used for medical advice, diagnosis or treatment.

Jamie Sullivan:

Please do consult with a physician before making changes to your own COPD management plan or if you have any concerns or questions about COVID-19 symptoms. We will be making the recording of today's webinar available within 24 hours. The information presented on today's webinar about COVID-19 was current as of today, May 21st. But as you know, the information about the disease and the recommendations discussed today are changing rapidly. If you're viewing the recording of this webinar, this information may no longer be accurate. So, let's get started. We will begin by covering a few updates on the COVID-19 situation and the ongoing research efforts. We're going to review several frequently asked questions related to COPD management during COVID-19 and discuss what you should consider as states and health systems restart their normal operations.

Jamie Sullivan:

One of the most frequently discussed topics lately on COPD360social has been how to wear face coverings without exacerbating your shortness of breath. So, we'll share some tips and then conclude with a brief discussion of issues to watch as more states are reopening officially. So, the presentations have been informed by your questions. However, we recognize it's impossible to cover everything during the webinar. So, rest assured if your question is not answered today, we will continue to consult with our medical and scientific experts, and we'll be providing additional content online and in future webinars. These topics will be covered by a panel of world class medical experts.

Jamie Sullivan:

We're grateful for their time and their dedication to informing and empowering the COPD community during a period that is also taxing on medical professionals everywhere. We're again joined by Dr. Byron Thomashow, a practicing pulmonologist and Professor of Medicine at Columbia University Medical Center and the COPD Foundation's Chief Medical Officer.

Jamie Sullivan:

We're also grateful to have Dr. MeiLan Han with us. Dr. Han is a Professor of Medicine at the University of Michigan, and as a practicing pulmonologist, she's been actively involved in her health systems, COVID-19 response. Dr. Thomashow and Dr. Han will also be joined by the COPD Foundation's own Stephanie Williams, a registered respiratory therapist and the Director of Community Programs for the foundation.

Jamie Sullivan:

As you can see, we've got an incredible wealth of expertise here today and a packed agenda. So, without further ado, let's kick it off by hearing from Dr. Thomashow.

Dr. Byron Thomashow:

Thank you, Jamie. I hope everyone is well out there and staying safe. Most of you have seen this chart before. As you all know COVID-19 is a new disease caused by a novel coronavirus that is different from the common cold, flu or pneumonia. COVID-19 emerged in China in late 2019. It is now present in multiple other countries, including the United States, and the numbers continue unfortunately to rise.

Dr. Byron Thomashow:

As you can see, there are now over 1.5 million Americans who have been infected and 93,000 deaths, really staggering. Worldwide, there are now over five million cases and over 328,000 deaths. The World Health Organization just announced today that there was a record spike in a one-day total of new cases, 106,000 new cases. So, we may be making progress, but we're certainly not out of this yet.

Dr. Byron Thomashow:

As far as COPD is concerned, the good news is the reports from China, Europe, and the United States suggest that patients with COPD are not at any greater risk of catching COVID-19. Most studies suggested only somewhere between 5 and 9% of hospitalized COVID-19 patients have COPD. A recent survey that is still ongoing on our 360social site: of 595 respondents, only 27 of them have been told by the healthcare provider that they had COVID-19. Of those, only one of them has been hospitalized.

Dr. Byron Thomashow:

Of those, only 12 have actually been tested and 10 of those tested were negative and the other two are pending. It's an example of how the testing still is not at the level that we need to do, but in the example, again, that patients with COPD don't appear to be at particularly greater risk. Now, having said that, if a COPD patient does develop COVID-19, then their risk of developing more severe disease is higher just as would be for anyone with a significant comorbid condition, particularly if they're getting a little older. We suspect that the patient with a more severe disease are at greater risk, but patients with COPD certainly can and have gotten better from COVID-19.

Dr. Byron Thomashow:

It's important to remember that. But especially as we start reopening the country, it's really important that patients with comorbid conditions, patients with COPD, continue to take all the precautions to limit the chance of getting the disease. Let's take a look at a couple of the changes or the data that's developed over the last week or two.

Dr. Byron Thomashow:

So, as we've mentioned before, remdesivir is an antiviral agent. It's an IV medicine. It's not an oral pill. There was a large NIH study, which suggested that patients treated with remdesivir had a 31% faster time of recovery. That was clearly significant. There was also a suggestion that there could be a mortality benefit, even though that didn't meet statistical significance. In another study, a cohort of patients with severe COVID-19 who received the drug had a significant improvement in their oxygen support status in almost 70% of the patients. All of that is good and all of that led to the granting of emergency use authorization by the FDA early this month.

Dr. Byron Thomashow:

Distribution is being controlled by the U.S. government, mostly through states and to specific hospitals. It's important to note that there are multiple COVID-19 drug trials underway combining remdesivir with other agents. That's really important because that's the approach that has been taken for years with other diseases, tuberculosis, HIV, cancer now. So, these are really progress going forward. Next slide, please. Early, but we're making progress.

Dr. Byron Thomashow:

Vaccines. As we mentioned the last time, Oxford University developed a vaccine for MERS, a similar coronavirus, which appears to be safe and provided potential immune response to MERS for at least a year. They began adapting that vaccine for COVID-19 in January and some monkey data suggested that those monkeys given the new vaccine did not fall ill despite subsequent heavy viral exposure.

Dr. Byron Thomashow:

It was just announced today by AstraZeneca that AstraZeneca has received a billion, that's billion with a B, dollars from the U.S. to push forward with this vaccine. Obviously, there's still work to be done, but it is a sign of progress. Early this week, Moderna, a biotech company in the Northeast, reported that in the eight patients followed for six weeks -- a vaccine, an RNA vaccine they had developed -- triggered a significant antibody response in a Phase 1 trial.

Dr. Byron Thomashow:

Again, that doesn't guarantee that there is going to be some level of immunity, but it is suggestive. These are early. There are lots of vaccines being tested. There are a number of human trials. That doesn't mean we're going to have a vaccine next week or next month, or even this year, but hopefully it is coming.

Dr. Byron Thomashow:

Next slide. I didn't think we would need to talk about this again, but for obvious reasons it's become an issue again. There was a small French study, a number of months ago, of only 26 patients suggesting that there might be a benefit from hydroxychloroquine, a drug that we've used to treat malaria for years and a drug that is approved and widely used for treating rheumatoid arthritis and lupus.

Dr. Byron Thomashow:

Unfortunately, the data, since that early study, have been far less enthusiastic. It was a clinical trial of two doses of the drug which was halted because of increased EKG changes, cardiogram changes, and higher mortality in the high dose group. A study just released this week suggested that there was no difference in hospital mortality of patients who received either hydroxychloroquine, azithromycin, or that combination, or with those who received none of those drugs. And unfortunately, there was an increased incidence of cardiac arrest in those people who received the combination therapy. Finally, a large observational study done at my site would suggest that there was no difference in those being treated or not. The take home message is that these results do not suggest its present use outside of randomized clinical trials.

Dr. Byron Thomashow:

Next slide, please. This last slide I have is actually not about COVID-19 but it is I think a really important slide. There was a recently released paper by JAMA of almost 200,000 hospitalized COPD patients. Only a tiny percentage of them unfortunately were initiated in pulmonary rehab within 90 days of discharge, but of those, there was a dramatic improvement in those patients in their one-year survival -- in those patients who had the rehab initiated within 90 days. Certainly, stressing that pulmonary rehabilitation within three months of discharge was significantly associated with a lower risk of mortality at one year. Pulmonary rehab works. We all know that. It is clearly been underutilized in this country.

Dr. Byron Thomashow:

One of the things we need to push forward with as we discussed in the last webinar is to see how telerehab, how rehab delivered by telemedicine, can work and see whether or not we can match some of these results that actual rehab has shown. It's really important we push forward. Jamie, back to you.

Jamie Sullivan:

Great. Thanks so much, Dr. Thomashow for sharing these important and somewhat hopeful updates. So, now we are going to turn to Dr. MeiLan Han.

Dr. MeiLan Han:

Thank you. Welcome everyone and thank you for joining us. I am a pulmonologist at the University of Michigan in Ann Arbor and I care for quite a few patients with COPD. As I've been talking to a lot of my patients, we've been getting a lot of questions. So, we've really tried to think about the questions we're

getting most and think about some of the issues that are most pertinent to this pandemic, and to do our best to provide you some thoughts.

Dr. MeiLan Han:

I'm going to go ahead and put a little bit of a disclaimer out there. This is, in some ways, what I'm going to call a data-free zone. We don't know as much as we would like. So, these really kind of represent our educated opinions based on what we know and also are kind of reflecting what's going on in medical centers around the country.

Dr. MeiLan Han:

So, one of the things that we wanted to address that you may have heard is: what about nebulizers? Is it safe to continue using nebulizers? You may have heard that, for instance, some hospitals are not allowing the use of nebulizers in the hospital. I think it's important first to remember why we use nebulizers. So, there are some medications that are actually only available in nebulized form. For other patients because they may have dexterity issues or very limited respiratory reserve, it may be that your doctors prescribed you nebulized medication.

Dr. MeiLan Han:

For many patients it can work very well. The issue that has come up with the pandemic is that the nebulizer can spread viral particles, and can aerosolize viral particles if the person using the nebulizer is actively infected. So, what does this mean? Well, for one thing, many health systems have now banned the use of nebulizers where often we would use nebulizers if a patient was admitted to the hospital, say, for a COPD exacerbation. We are looking to other alternative treatments such as metered dose inhaler. So, there still are options.

Dr. MeiLan Han:

So, what should you do if you do use nebulized medication? Well, I think the first thing again to remember in all of this is that I think it's really important that COPD patients stay on their maintenance medications. That's going to be a message you're going to hear from me and from Byron throughout this presentation. I do not recommend doing anything like abruptly stopping your medications unless you talk about it with your healthcare provider first.

Dr. MeiLan Han:

If you do not have COVID, it is not an issue. The only time it becomes an issue is if you have symptoms of COVID or have confirmed COVID. This is where there may be risks for transmitting the virus to someone else. Now, if you live alone, it's again, not an issue. The issue really becomes if you were to be actively infected and you have other noninfected people in your home that are trying to kind of quarantine themselves from you.

Dr. MeiLan Han:

I think the general recommendations are that if you are quarantining people in the home where one person is infected and others are not, in general, it is recommended that infected individuals try to stay in their room. If you do that, that should help to minimize spread of any viral particles that might be spread through the use of a nebulizer.

Dr. MeiLan Han:

Other options might be to go out to a closed patio or to a garage that no one else would enter for a few hours. The data suggest viral particles may linger in the air for, say, a couple of hours, particularly indoors. So, that would sort of be our recommendations that you would try to do this in a room that's separate or perhaps on a patio or garage that you can keep other people out of if you have suspected or confirmed COVID-19.

Dr. MeiLan Han:

Again, if you do not have an infection, then it's not an issue. If you live alone, it's not an issue. But again, if you are concerned, again, this is reason to call your doctor. But again, I'm really emphasizing this important that patients stay on their maintenance medications, because if you were to contract infection, we want your lungs in as best shape as possible to go ahead and try to handle it.

Dr. MeiLan Han:

We go on to the next topic here. So, the next thing that we've gotten a lot of questions about is, what do I do about other things that I may use in the home to help me with my breathing? So, for some patients that might be a CPAP or a BiPAP machine that you use at night. Other patients may have other types of airway clearance devices that they use.

Dr. MeiLan Han:

Again, the issues here, again, very similar to that of the nebulizer. The concern is simply that some of these devices could aerosolize viral particles. Again, not an issue if you live at home by yourself. Not an issue if you do not have COVID-19. Like the nebulizers, many hospitals are banning the use of these types of equipment within the hospital, particularly if you have COVID-19.

Dr. MeiLan Han:

So, again, our same [unintelligible] would apply. The American Society for Sleep Medicine is recommending that persons who do have confirmed or suspected COVID-19 that need one of these devices, again, use them in a different bedroom. So, for instance, if you use a CPAP device at night to help you sleep, then it might -- and you do have COVID -- then it would be ideal, for instance, if you would sleep in a different bedroom than noninfected individuals within the home. Of course, nothing is guaranteed, but I think this is just a common sense recommendation just to try to decrease risks.

Dr. MeiLan Han:

It's also important that you maintain good hygiene on your devices and continue to clean them as they should be. Making sure that you're using clean devices I think will also help to prevent any further spread of infection if, for instance, viral particles were to get on parts of the machine, which is likely if you do have COVID-19. You would want to keep the devices separate from people, probably not let them handle those devices until they've been cleaned. Do you want to go ahead and go into the next slide? Okay.

Dr. MeiLan Han:

This is an important area. In fact, I saw in the New York Times yesterday that they're concerned that many children will not be getting their scheduled vaccinations that we know children need to get because people have been afraid to go to the doctor period. This is a real concern. We've already got

one virus that's obviously causing huge problems throughout the healthcare system, but the good news is that we do have vaccines for some of the existing problems that we had before COVID-19. For our COPD patients, that includes influenza vaccine in the fall. So, we don't have to worry about it right this second, but it is something we're going to have to think about in the fall and then the pneumonia shots. That includes both the Pneumovax and the Prevnar vaccine.

Dr. MeiLan Han:

So, we know there's reasonably good data that both the pneumonia vaccines and the influenza vaccines do help patients with COPD. They each have their own vaccination schedule. We're still strongly recommending that if you are due for one of these vaccines, that you still go ahead and get your vaccine, stay up to date, because we know that these other problems still exist. It's not like they're going to go away just because of the pandemic.

Dr. MeiLan Han:

Now, having said that there are steps you can take to minimize your risk of COVID-19 exposure. When you go to get your vaccine, you can think about the location. Some people do go to their healthcare professional's office, but they might be offering curbside vaccinations. Other people, for instance, maybe go to their local pharmacy. Those may be options. Of course, continue doing all the things that the experts are recommending, including wearing a mask, washing your hands often.

Dr. MeiLan Han:

I think we are still trying to figure out where this is all going to land at the University of Michigan. I have been seeing most of my COPD patients virtually, but at some point soon, I am going to start bringing people in for in-person visits as certainly as needed and maybe it will be some mixed hybrid version in the future of virtual visits and in-person visits.

Dr. MeiLan Han:

We really, really want our COPD patients to be getting the best possible care during this time. I think many institutions are taking extreme measures now to try to protect non COVID patients while in the healthcare system, including frequent wiping down of surfaces, social distancing, everyone's wearing masks, et cetera. I think from what we're seeing, this is working. We are not seeing for instance, large swaths of healthcare workers that are not exposed to COVID patients getting affected at this point.

Dr. MeiLan Han:

So, I am reasonably confident that these measures are working and I do want patients to feel safe. If they have concerns, obviously, they should talk to their doctor about where the safest place would be to get their vaccine, look at the website for their local healthcare system so that you know what to expect. For instance, I think many places are issuing masks for instance or asking patients to wear their own in. Visitors in many instances are being restricted. So, you want to prepare for that visit, look at the websites, call, but we do need to continue to take care for our patients. I do think that we will be able to do this safely. I do feel confident about that, but I think it behooves everyone to be as well educated as you can be before going in to see the doctor.

Dr. MeiLan Han:

Can I go ahead and advance to the next side? Some of the questions that we've gotten relate to particularly steroids and azithromycin, because many patients who have COPD get steroids and

azithromycin, either for exacerbations or in some instances we have patients, they may be chronically on steroids or azithromycin or both.

Dr. MeiLan Han:

One question we've gotten is: does being on steroids such as prednisone, which you need to take as a pill or even inhaled steroids make COVID-19 worse? This has been a question that a lot of us have been trying to sort out since the beginning of the pandemic. What I can tell you is right now, there really is no evidence to suggest that COPD treatment should change during the COVID-19 pandemic. We have no reason to believe right now that it increases risk for complications or even your risk for contracting the virus.

Dr. MeiLan Han:

What's really interesting is when we look at data on what percentage of the patients who have COVID had COPD, it's actually currently much less than what we know is the prevalence of COPD in the patient population. I think this is probably due to COPD patients being extremely careful, but certainly there is no evidence right now to suggest that the medications patients with COPD regularly take would increase risk.

Dr. MeiLan Han:

Now, if you are in a hospital, I think what most physicians are recommending, or should you have a flare up, we still are recommending prednisone should you need that. I can tell you just completely anecdotally, I've had two patients with asthma in whom I have suspected COVID-19, they've both received steroid bursts and both are doing well. I can also tell you anecdotally, and I can tell you this because it was actually in our local newspaper, that the very first patient admitted and the very first patient discharged at the University of Michigan with COVID-19, actually had had a lung transplant. So, they were clearly on steroids and they, believe it or not, walked out the door and never required intubation.

Dr. MeiLan Han:

So, certainly, patients with COPD are at increased risk for complications should they get COVID. But we also know there are patients remarkably who despite having significant lung issues still can do okay with this. Now, another question we've gotten is whether azithromycin can help prevent catching COVID. There's unfortunately no reason at this point to suggest that it prevents COVID. But because we know it can help patients with COPD, we would recommend go ahead and stay on it because it hopefully will help to prevent other kinds of flareups if you do have COPD.

Jamie Sullivan:

So, I think Dr. Han, that is the end of this section. But just before we move on, I wanted to thank you for reinforcing the important message that for the most part COPD treatment shouldn't change during the COVID-19 pandemic. We appreciate the insights you shared and your dedication to helping those who are suffering with COVID-19 while still looking out for your COPD patients.

Jamie Sullivan:

So, now we're going to pivot and invite Dr. Thomashow back to join Dr. Han in a discussion about resuming elective medical care. In other words, non-urgent or life-threatening care. They will lead us through a number of considerations that are important to discuss if you're faced with a decision about

whether or not to proceed with tests, surgeries, or even dental care. So, Dr. Thomashow will you please start us off?

Dr. Byron Thomashow:

Thank you, Jamie, and thank you, MeiLan, for joining us. I want to stress that just because there is COVID-19 doesn't mean that other medical problems don't longer exist. Many people, many of us, have delayed following up on some of our medical issues which are less urgent because of the understandable concerns about COVID-19. We are reaching the point where, especially as we begin to open up, that those issues have to be addressed. The concept of elective does not mean there's not a medical problem.

Dr. Byron Thomashow:

Elective surgery doesn't mean it's not surgery that needs to be done. It just means it doesn't need to be done urgently. I think we all now at this point need to start making sure that our overall medical status is good, so we stay well. So, what sort of questions do you ask?

Dr. Byron Thomashow:

Maybe the most important one is what are the benefits and risks of the procedure, the test itself? What is the level of COVID-19 exposure risk associated with the preparing for the procedure? Is there active community transmission of COVID-19 in the area where you're going to get care? How often will you need to go to a healthcare facility to prepare for the procedure? Does it require long-term travel? If so, how can you limit the risks during that travel? What precautions are the medical facilities putting in place? All of us are going through this. All of us are trying to prepare in the best ways that we can.

Dr. Byron Thomashow:

Will you need to stay overnight in a hospital or will it be done in an outpatient setting? Will your support caregiver be adequately protected from COVID-19 exposure before, during, and after the procedure? All of those things. These are a list of questions that are worth thinking about and worth talking to your provider about, talking to anyone who might be thinking about doing a procedure on you, and talking to your surgeons.

Dr. Byron Thomashow:

We've gotten specific questions about some procedures that are sometimes done in patients with advanced COPD, like lung volume reduction surgery, or some of the bronchoscopic procedures. Many of the centers that are involved in those procedures are beginning to plan to reopen. Certainly, that's the case in our institution. I'm sure that's the case with MeiLan and many of the other centers.

Dr. Byron Thomashow:

I was in discussion with Dr. Criner at Temple, who is one of the leading experts in the bronchoscopic world. Their center is already opening up. So, you will see that, and all of us are taking precautions to try to make it as safe for everyone as possible. MeiLan.

Dr. MeiLan Han:

Yeah. No. I agree, Byron, this is a really challenging time and centers are kind of opening up in phases based on the prevalence of COVID-19 and community spread within the area. So, we're going to see a

lot of variation across the U.S. and so you'll have to be patient as the timelines are going to differ. So, other questions that we've got here to consider: what is the risk that your condition could rapidly progress if you didn't get the procedure or test? What does the best available data say about the risks of waiting? I would say this is kind of a tricky thing. I've been doing a lot of virtual visits and I've been taking them sort of one at a time. There are certain things that we know we're a little bit more peculiar to COVID, things like fever, losing sense of smell, taste, that sort of thing that may increase my thought process that someone has it, but also underlying health conditions like COPD and also being on immunosuppressives.

Dr. MeiLan Han:

So, these are all things that kind of weigh into my mind with respect to testing. So, I think this is very individual, and is also going to depend on the center you're at, and the rules that are in place. We still have shortages of testing swabs and media. So, you've got to work with your local health system about getting the test and access to the test and it is going to differ. But I think that some of those symptoms in particular that I mentioned do increase the potential likelihood that it maybe COVID.

Dr. MeiLan Han:

We have another question here: are there alternatives that will be adequate to prevent rapid progression in the meantime if you delay? So, here we're talking about, again, the routine medical care. I myself have been pushing off the dental visits and other things that I would normally get. I think the health system is really trying to as quickly as possible bring things back in a phased way, depending on the urgency.

Dr. MeiLan Han:

So, I suspect things like colonoscopies and pap smears and things like that are probably going to be at the end. But things that are considered to be slightly more urgent, let's say you've got something like a tooth that's starting to hurt, things like that. I think we will start to be able to get people in for that sort of thing.

Dr. MeiLan Han:

Certainly, I would say things like cancer, we're definitely dealing with now. That is definitely something that we are definitely bringing people in for and definitely figuring out how to manage. There'll be a little bit at the judgment of your provider, but we are starting to ramp up slowly. I think there will be individual guidance available sort of in a health-system level. So, check that with your health system and your provider on a frequent basis to determine at what point.

Dr. MeiLan Han:

I know at the University of Michigan, for instance, we as providers are looking at the list of all the stuff that we ordered on a weekly basis. They're starting to let us start to get some of those patients in on a highest need basis. So, I do think that these sort of elective things are going to start happening over the next couple of months. Again, we're going to see a lot of variation across the country. Byron, do you have any other thoughts on that?

Dr. Byron Thomashow:

No. It'd be nice if there was a national plan, but as you said, it is going to vary depending upon where in the country you might be. Everyone is sort of reinventing medical care here because this is a new issue,

but everyone does agree that medical problems need to be taken care of. We understand the importance of overall medical health, and we also understand the risks. So, we're trying very hard to fix those issues.

Dr. MeiLan Han:

Yeah. As you can see on the slide here, it mentions telehealth. We've certainly got some options. Unfortunately, one of the things that we're grappling with in the pulmonary world is: how do we get pulmonary function testing for our patients?

Dr. Byron Thomashow:

Yeah.

Dr. MeiLan Han:

That's going to be really tricky. Some centers are going to go ahead and be doing COVID testing before you get a PFT. Others are not. Again, those are sort of institution-by-institution decisions based on prevalence and risk. So, again, that's likely to vary significantly depending on where you live.

Dr. Byron Thomashow:

Yeah.

Dr. MeiLan Han:

Do you want to go ahead and go to the next slide?

Dr. Byron Thomashow:

Thanks, MeiLan. MeiLan brought up this issue and this is an issue that has gotten put off for a while for all of us pretty much. That's the issue of dental care. It's obviously an important issue. In the absence of issues such as gum disease or dental emergencies, the American Dental Association and the CDC have generally recommended avoiding routine office visits. The ADA's advisory task force had provided a series of listing of options, which are listed here, pre-appointment screening, in-office registration, and standardization. Patients should always wear a mask, the staff wears appropriate masks and gloves, dental and dental hygienists have been suggested to avoid some of the high-speed, aerosol-generating tools, for the same sort of reasons that MeiLan was talking about before with nebulizers and other devices.

Dr. Byron Thomashow:

Most spread of this disease is with droplets within a number of feet. But aerosolizing is possible. That's why we have to be careful. I do think we're reaching the point as the world reopens that people are going to need to start getting their dental care. I think you need to talk to your provider, find out how important it is. Then we'll take each safety precaution step. Again, as with the hospitals opening up and the doctor's office opening up, this will be a stepwise process starting with those in greatest need. Back to you, Jamie.

Jamie Sullivan:

Great. Thank you so much for identifying some of these key factors that can help guide our decision making. We will be putting out additional information and making these questions available as a

handout on our COVID-19 page shortly and welcome your feedback if there's additional issues you faced that you think should be considered, if you've already gone through some of these deliberations. So, before we start to hear from Stephanie Williams, I wanted to remind everyone, if you do have questions, you can go ahead and type them into the questions panel so that they are lined up for the conclusion when we will have some time to answer them. So, with that, now we will hear from Stephanie Williams.

Stephanie Williams:

Thank you, Jamie. I am so happy to be here with all of you today to discuss this topic of living with COPD during COVID-19. It really is a stressful time to be living with a chronic condition like COPD, during an outbreak like this. I think that we have seen evidence of this over the last few months, as we have had many questions about, how do you know if you're sick with COVID or maybe you're having a COPD flare up?

Stephanie Williams:

We want to offer these webinars to you as a way to reassure you and give you information that can equip you to make good decisions about your day-to-day life. I think there are a lot of you who are with us today or watching the recording. You're taking the necessary precautions, you're staying home, practicing physical distancing, washing your hands for 20 seconds, wearing masks when you must go out. There are others of you who are still required to go to work. You're providing some essential service and are exposed to the public a bit more than you would like to be.

Stephanie Williams:

So, shifting gears a little bit from the first half of the webinar, we wanted to talk about a topic that has been coming up a lot in email questions. I think you may have seen Jamie skipped a few slides for me here. We're going to come back and circle back later on another webinar, or maybe another type of event and talk about the action plan that -- those were the slides that we just skipped. So, we're going to talk about some of these questions that have come up on COPD360social and other places and … it's face masks. This has been a really hot topic.

Stephanie Williams:

So, first of all, why is wearing a face mask important? Well, simply because scientific models suggest that up to 80% of transmission comes from asymptomatic carriers of the virus. So, when I say asymptomatic, that means people who don't have symptoms, they don't feel sick, they don't look sick, they don't know that they're spreading a very serious illness. So, this spread of the infection happens not only when people cough, but any time the droplets are released, as we've heard with Dr. Han and Dr. Thomashow, when they talk about the viral particles being on droplets and that kind of thing.

Stephanie Williams:

So, those particles can be released, yes, when you're coughing, but it can also be released when sneezing or talking or laughing or singing. Anytime you might be in close contact with someone that's doing any of those things, you would want to have a barrier between you and them. So, it makes sense that we want people to wear masks to prevent the spread of droplets during those times. So, make no mistake; I'm not trying to say that wearing a mask is easy because it is not. Wearing a mask can be really difficult. We have listed some of the reported reasons why people don't like to wear masks here and you can see them*. I get short of breath, my anxiety increases. I have this sensation of suffocating.*

Stephanie Williams:

In fact, yesterday, the British Lung Foundation just posted some comments on their Facebook page that speaks to the difficulty that people with respiratory problems can have when wearing a mask. With that in mind, we'd like to be helpful for you. We wanted to talk about different types of masks and face coverings. So, before we get too far into this discussion, I want to emphasize that you should wear the mask or face covering that is right for you. If it's uncomfortable or it doesn't fit properly, you will likely end up not wearing it or not going places you need to go, or you'll find yourself touching your face to provide relief, which is definitely something you shouldn't do.

Stephanie Williams:

The N95 masks that we've all heard so much about are what we recommend for healthcare professionals, ones that are doing direct patient care in those situations where they're dealing with COVID or suspected COVID patients. They're really not recommended for people with breathing problems because they do fit very tight to the face and don't allow for much air movement. That's kind of the point, right? You don't want air to be moving in around the edges of the mask because you may be inhaling the particles that have the virus attached to them.

Stephanie Williams:

So, there are other options that we can explore and find one that hopefully works for you. So, let's look at a few examples. These are being modeled by some of our COPD360social community members. The first one up in the top left hand corner is a surgical mask. So, as you can see here, it fits snugly over the bridge of the nose and it comes down below the chin. It's a little loose on the side, and it could be worn over a nasal cannula if care is taken when putting it on or taking it off with mask ear loops. These can be hard to find though because they are being used also by healthcare professionals.

Stephanie Williams:

The middle picture, the more vertical picture, what you see here is @Bill66 showing us another version of a surgical mask. This one is a little thicker than a normal mask. His even has a protective film on the inside of the mask as a barrier. So, you can see that it fits a little tighter around the edges of the face and provides a little better protection because of the way it's fit and because of the thickness of the material used. So, what he said to me, though, was it can still be difficult to breathe through it. He does report that he gets headaches and experiences shortness of breath when wearing this for long periods of time, which he has to do when he's at work. So, this may not be a good option for everyone.

Stephanie Williams:

So, let's look at the bottom left hand corner, and we can see an image of a homemade face mask. You see this mask covers the nose and comes down well below the chin. It has a little bit of a gap to help with that smothering or suffocating feeling that type mask can produce. If you're considering making a mask or buying a homemade mask from someone else, make sure that it follows the guidance given by the CDC. It needs to have at least two layers of tightly woven fabric, and it should fit over the nose and below the chin.

Stephanie Williams:

Some people are even making their masks with a little pocket in between the two layers. So, you can put a coffee filter, paper towel, or maybe even a Kleenex in that pocket for extra layer of protection. If you also look closely at this picture, you can see that our model has added a little hook made from a vinyl

covered paperclip to her mask. So, it hooks onto her glasses to keep it from slipping off. This keeps her from touching her face, which is important even while wearing a mask.

Stephanie Williams:

So, then looking on the right side of the screen, you can see the face covering section. These are made from a scarf on the top right hand side, bottom right hand side is from a bandana. If you're having trouble with claustrophobia or anxiety or shortness of breath while wearing the more traditional style mask, these might be good for you to try. They don't fit too snugly to the face, and they do allow a little air to come in at the bottom opening. The top right photo is done with a large scarf that starts out being placed over the bridge of the nose. Then she wrapped it around the back of the head.

Stephanie Williams:

Then the ends were brought back around to the front and tied up under the chin. Notice here, that there are also a series of clips that she uses to secure them to her glasses. So, she doesn't have to reach up and adjust the mask just to keep it in place. The bottom right picture is simply a bandana folded double and tied at the back of the head. The only place it sits firmly is over the nose and ears. So, air is able to enter the bottom opening and can help with that suffocating feeling.

Stephanie Williams:

Again, find the mask that fits and feels good to you. Some protection is definitely better than no protection. So, in the next slide, we're going to look at some things you need to know about wearing a mask safely. Number one, your mask should fit across the bridge of the nose. It needs to be secure, so it doesn't slip, and so you don't feel the need to readjust it. Number two, cloth masks should be two layers thick.

Stephanie Williams:

Again, tightly woven material is recommended. Even two layers of T-shirt material is good for mask making. It's flexible. It's comfortable. That is tightly knit enough that it should keep out a good deal of particles. The fabric should be natural fibers. They're easier to breathe through and they carry moisture away from you. Trust me, because I've been in healthcare a long time, I've worn a lot of masks. You will have moisture in your mask. You'll get hot. You'll sweat a little, the moisture created just as you breathe in and out. You'll be surprised at how much moisture there is underneath your mask. So, make sure you get a good breathable fabric.

Stephanie Williams:

Number three, wash your hands before putting your mask on. Good hand washing is crucial at all points in dealing with the spread of this virus. But before you put your hands near your face, please make sure that you wash your hands thoroughly. Number four, refrain from touching your face adjusting your mask. Anytime you touch your face, you're risking the spread of illness, not just COVID by the way, but other bacteria and viruses that are also still out there that we just aren't talking about as much right now. So, keep your hands away from your face.

Stephanie Williams:

Number five, remove your mask by touching only the ear loops. So, when you're taking your mask off, you only want to reach back behind your ears and take the ear loops off from around each year. If I've been to the grocery store, I will use hand sanitizer in the car before I take my mask off. If possible, at

least, use the sanitizer before bringing your hands close to your face to grab the ear loops. But do not touch the face covering portion of the mask at all.

Stephanie Williams:

Number six, wash your hands after removing your mask. Please make sure you're washing your hands for 20 seconds after you remove your mask or use sanitizer if you're in your car. Wash your hands as soon as you get home. Just another tip, I also keep a canister of cleaning wipes in the garage so I can wipe down my steering wheel, the gear shifter, turn signals, handles, et cetera when I get home. That way, I know everything is clean for my next trip out.

Stephanie Williams:

Number seven, wash and dry your cloth mask after each use. So, put the used mask right in the washer after you take it off. It's good to have several masks for this reason so that you always have one that's clean and ready to use. Number eight, for multi-use masks, store them in a paper bag in a warm place. If you have a mask similar to an N95, place it in a paper bag, leave it in a warm place. The typical coronavirus doesn't tolerate heat very well. So, there's some indication that this practice can help reduce the amount of virus, not eliminate, but reduce the amount of virus on the mask surface.

Stephanie Williams:

Remember, please, that physical distancing is still the best policy. But if you have to go out, please wear a mask and wash your hands frequently. That's all I have Jamie, back to you.

Jamie Sullivan:

Wonderful. Thanks so much, Stephanie, for tackling this important issue and thank you to our advocates who shared their pictures. I encourage all of you to share your tips for coping with face coverings and possibly your pictures on COPD360social. Your examples will really help others experiment with what works for them and make others comfortable with the idea of wearing face coverings. Okay.

Jamie Sullivan:

So, as we near the end of today's program, we wanted to really recognize the shift in our national dialogue that's really picked up momentum in the recent weeks and discuss a little bit about what reopening the country means for our community. This is really just the start of this conversation. We want to hear from you about what you're struggling with, what's going well as your communities reopen so that we can be responsive to what's happening on the ground.

Jamie Sullivan:

So, it's hard to ignore the growing uncertainty and disagreement around reopening, but the fact is, nearly every state has begun to roll back restrictions and more loosening is planned in the coming weeks. So, as tough as it is to cope with, it is important to stress that even if your state has reopened businesses and recreation, it's likely not safe for people with COPD and other high-risk populations to let their guard down. The level of risk tolerance for officials that are making these decisions is just not the same for people with chronic conditions.

Jamie Sullivan:

So, we encourage you as to the CDC recommendations to continue to stay home as much as possible and to take all possible steps to avoid exposure to COVID-19. There are a few important issues that we'll be following as states reopen to ensure that our high-risk community is able to take the steps needed to protect yourselves from exposure over the long term. High on the list is how states and the federal government will adapt to allow for additional paid leave as businesses open.

Jamie Sullivan:

We know that plenty of people with COPD remain in the workforce and you're facing really tough decisions right now between going back to work and risking your health or losing your job or unemployment benefits. We as well as the chronic disease advocacy community, we're actively working to identify solutions. We will also be looking to ensure your access to expand the telehealth services is maintained and hopefully expanded to include things like pulmonary rehabilitation. We also have communities that have jumped into action to protect high risk groups, continue to provide these accommodations as reopening continues. Things like added delivery services, contactless pickups, special shopping hours, and more.

Jamie Sullivan:

How will states and local communities incorporate physical distancing, especially outdoors and in essential services? You've probably heard many suggested it's time to reopen because if you're afraid or high risk, you can just stay home. We know that isn't the reality for many of you and we plan to work with you and our colleagues to represent your needs in these discussions.

Jamie Sullivan:

Finally, we can't discuss the topic of physical distancing and extended periods of home isolation without recognizing the reality that this is placing an extreme hardship on many people's physical, mental, and financial well-being. We hope you'll share with us what these impacts are and join in the supportive discussions taking place on COPD360social, Facebook, and here on the webinars. We will get through this together.

Jamie Sullivan:

So, to close out today's webinar, I want to make sure that you're aware we have launched our second COPD and COVID-19 experiences survey. We urge you to complete this anonymous survey to share your experiences during COVID-19. This is not a survey just for people who have been diagnosed with COVID-19. We want to hear from all of you about how the disease has affected you. Results will help guide future research and future programs and resources to support the community during these trying times.

Jamie Sullivan:

The survey will be available until the end of the month and results from the first survey are available on our coronavirus page. There's a recording under the webinar recordings that highlight some of what we learned from the first survey. Thank you to all of you who have completed the second survey already. So, as we transition to our last phase, I wanted to make sure you know that there's support out there.

Jamie Sullivan:

Our goal, again, is to inform you of important changes in the CDC and WHO recommendations while also adding the context and additional information that's directly relevant to our COPD community. You can find our updates directly from our homepage if you haven't already been there by clicking the top of the page. We'll continue to post regular updates on our blog, as well, including the answers to questions you submit, updates on the national response to the coronavirus, and other important issues.

Jamie Sullivan:

Please check in often, get support, support others, view new videos and blogs, and let us know how you're doing. Here's some additional credible resources to visit regularly. These sites are continually evolving and providing new information on the disease outbreak as well as practical, action-oriented advice. I would encourage you to consume this information as you see fit. Okay.

Jamie Sullivan:

So, before we wrap up, I think we're ready to take a few questions. As a reminder, you can type your questions directly into the question box in your GoToWebinar control panel. We will do our best to respond to every question. But even if we don't have the time to do so today, we will make sure to get you answers to the best of our ability. So, please don't hesitate to enter your questions.

Jamie Sullivan:

With that, I'm going to open it up. Stephanie, could you read the first question?

Stephanie Williams:

So, the first one I see here is a question about masks. So, we can open this up to the doctors. What is your opinion about the N95 masks?

Jamie Sullivan:

Great. I think Byron's on mute. Dr. Thomashow, if you can comment on the KN95 mask.

Dr. Byron Thomashow:

Okay. So, most of the masks that Stephanie, we're talking about are masks that prevent the spread of the disease. That's really important as we work together to make this better. There is a mask that everyone's been aware of, the N95 mask, that is more protective of catching the disease. That mask is even more difficult to wear for longer periods than the mask that we've been talking about before. The other thing, and MeiLan can comment on this as well, is that masks provided particularly for healthcare providers who are known to get exposed. I mean, the risks are quite clear in that population.

Dr. Byron Thomashow:

As MeiLan could comment as well, for those of us in the healthcare field, we get fitted for our N95 mask every year. So, it's not simply a matter of sticking the mask on and be done with it. You actually have to get special fitting and make sure that it's working correctly in order to be approved for its use. There was a study that just came out of Singapore that was published in JAMA Network Open that suggested that participants, these are the general population, were given N95 respirators with an instructions sheet and then asked to put one on. Only about 13% of them actually passed the visual mask fit test.

Dr. Byron Thomashow:

So, not only is the N95 mask more difficult to use, because it can be more uncomfortable for people who use them. But unless it's put on appropriately and tested appropriately, you really don't know that it's going to be effective. Many of us worry that those people have N95 masks in their possession, and there's a lot of them out there, think they're protected and they may not be. Not all N95 masks are the same. There are in N95 masks, which are not as effective as others. So, I would stress at this point in time, the N95 masks are basically related to healthcare providers who have been fitted and tested. MeiLan, do you have any comments on that?

Dr. MeiLan Han:

Yeah, I would just echo what you've said. The mask part may work, but unless it fits absolutely 100% snugly around every single part of your nose and your cheek and your chin, then it actually can still let viral particles through. There's a lot of things I think people don't realize that skin folds and for instance, beards, mustaches may turn an N95 essentially into a regular mask. Now, again, that doesn't mean that you shouldn't be focused on wearing the face mask or the covering to protect other people. But if your concern is to protect yourself like the healthcare workers, it has to fit absolutely perfectly. That's why for instance, University of Michigan, because they couldn't get their masks from the usual supplier just bought a new type of N95. We all had to go in and get refitted with a different size because the make and model had changed.

Dr. MeiLan Han:

I think I also heard the term KN95 in the question. Just so people are aware that is actually an N95 type of mask. It's made in China and they have their own standards. It's slightly different than the US mask and some of the hospitals here been starting to use those, but have been testing them to make sure that they're fit for usage. It's raised all sorts of complications for the hospitals because they're not getting it from their same suppliers where they knew the fit and that sort of thing. So, that may be more detailed than our listeners need, but that kind of helps you to understand some of the nuances with N95s.

Jamie Sullivan:

That's great. Thank you so much for that. Our next question is recognizing that COVID-19 isn't the same as the flu. Have they looked at Tamiflu as a potential treatment?

Dr. Byron Thomashow:

MeiLan, do you have any data?

Dr. MeiLan Han:

Yeah. I have to admit I haven't seen that. The type of virus though that COVID is, which is a coronavirus, is very, very different than the influenza virus. So, I don't think that there were initial thoughts that that particular drug was necessarily going to work. I think based on the structure of the virus and what they know from our prior SARS and MERS infections that they tried to deal with previously, which was one of the reasons why they kind of went out of the gate with remdesivir.

Dr. Byron Thomashow:

I would agree with that completely. I would also stress something that's, I think, really important. It's a little bit about the hydroxychloroquine, but it's about other medicines, as well. Medicines like Tamiflu, medicines like famotidine. There is a lot of obvious hope and interest in an available drug, a drug across the counter or a drug that's available in pharmacies with a prescription, will make a difference. The data just isn't there yet. All of these medicines, even the medicines that have been approved, even the medicines that are now over the counter because they've been around for such a long time. All medicines carry side effects and carry risk. We need to know that the medicines we're using have a reasonable chance of being effective.

Dr. MeiLan Han:

Yeah. I just looked up quickly. It looks like there may be some studies that are looking at Tamiflu, but we just don't have any data yet.

Jamie Sullivan:

Okay. Great. Thank you. So, we've got a couple similar questions around the concept of opening up and what is safe and when is it time. The topics that our listeners are questioning are, *what should I do about going back to work, especially if that work is in a healthcare facility?* Also, we have one person who's questioning, *"When is it going to be safe and how could I lift the spirits of a friend and family member who is in a group living situation where they're not allowing visitors? When will it be safe to visit again?"*

Dr. Byron Thomashow:

Well, let me take the second one and I'll give MeiLan the first one because I have no answer to the first one at all. The second one, the group living, is a real problem. I mean, obviously, there have been a number of issues. One of the first major outbreaks was in a nursing home in Washington and obviously in New York and other places, there have been significant losses in nursing homes. These are older people. They often have many comorbidities. It's obviously a very difficult situation and the people who are trying to help in those situations have suggested that we need to limit the exposures.

Dr. Byron Thomashow:

I understand that. I don't have a simple answer to this question. I think that hopefully as we work through it, there will be ways of reestablishing the connection. I would suggest at this point that you take advantage of FaceTime and other connections. It's not the same as laying on hands and I understand that. But just as many of us are doing with our grandchildren, we need to do with our parents and our grandparents as well until it's safer to open things up. MeiLan, the broader question of going back to work in this environment?

Dr. MeiLan Han:

This is such a hard one. I have gotten so many phone calls, emails, messages from patients all with chronic lung conditions, wanting to know, can they go back to work? I have some patients that work in hospice. I have patients that work in hospitals themselves. This has been really, really, really hard. I think there is not going to be a one-size-fits-all answer. Clearly, no matter how many protections you take, there's always some risk with going out. There's some risk associated with being in a healthcare setting.

Dr. MeiLan Han:

So, I think that you've got to think both about what your condition is, and then also the type of setting that you might be working in and have a very frank discussion with your doctor. I mean, for some patients they can afford not to work, and other patients, it would be very, very difficult if they weren't working. So, it's very difficult to provide a, I think, across-the-board answer. I've really just been trying to counsel my patients individually based on everything I know about their situation.

Dr. Byron Thomashow:

I think that that's the only way we can do this now. I mean, I do think that the more testing we do, the better off we'll be able to gauge. I think that that's a concern that many in the healthcare field continue to have because the availability of testing, the availability of protective material is still not quite where it needs to be. It's better than it was, but it's still not where it needs to be. I think the testing will make a difference. It wasn't part of the question, but I do want to touch on something that I think all of us in the healthcare field have been saddened by.

Dr. Byron Thomashow:

I mean, my colleagues, particularly those who have been spending more and more time in the hospital, describe the fact of patients dying alone, of not being with their family at the end. We all fully understand how terrible that is for everyone involved. I think everyone needs to know that the healthcare providers who are out there are doing the best they can to try to address that issue and to try to hold the hands.

Jamie Sullivan:

Yeah. Definitely. Thank you. I think the question around work is another reason why we are so interested in seeing that issue addressed at the policy level so that we can make sure there are options so that people don't have to risk their health if that is an issue. So, quickly, going to take two last questions and then we will make sure to get back to others with responses. Hopefully, a simple one: *can CO2 increase when you're wearing a mask, whether it's cloth or disposable ones?*

Dr. MeiLan Han:

That is a really good question. It's funny. I was actually just researching something slightly related the other day, which was whether breathing through scuba gear increases your carbon dioxide. It may be somewhat similar. It certainly can and at least with the scuba gear, a snorkel potentially. So, I would say it's probably a potential if it's absolutely non-breathing. But I think that potentially something that's looser fitting probably is not going to be a significant issue, but I have to admit it's a bit of a guess. Byron, what do you think?

Dr. Byron Thomashow:

I would guess the same thing you just guessed, but I think under most circumstances, it's probably not a major issue. I mean, the question would be in patients who are chronic CO2 retainers who therefore may have a little less margin of error, if you will. It may be a little more of an issue. I don't think most of the available masks would cause that, but it is a concern.

Jamie Sullivan:

Okay, great. Thank you. To close this out, we've had several questions come in related to pulmonary rehab. So, could you share your thoughts on when will it be safe and what are the considerations for reopening pulmonary rehab and what about some strategies outdoors or things like mall walking or outdoor tracks as an alternative for maintenance in the meantime?

Dr. Byron Thomashow:

I'll let MeiLan start and then I'll finish.

Dr. MeiLan Han:

Yeah. At least at the University of Michigan, it's unclear when and how our pulmonary rehab is going to be reopening. I think that'll probably depend on the setup of the facility and whether they feel like they can maintain, for instance, the social distancing and have enough space to allow people to exercise safely. So, again, I think that's going to probably depend a little bit on the facility. What I have been recommending to my patients in the meantime has been to do a combination of light weights and what they can do indoors.

Dr. MeiLan Han:

I think getting outside in particular and walking is an excellent option. I think outside, to be honest, is probably your safest bet. Even though, for instance, if someone has COVID and they've coughed because of the massive amount of air circulation outside those viral particles are going to be dispersed pretty quickly. So, I really like the option of exercising outside when it's feasible for patients.

Dr. Byron Thomashow:

I would agree with that as well. I also want to stress and I'm sure MeiLan agrees: pulmonary rehab works. It's ludicrous that only a couple percentage of the people with COPD in this country actually ever have the ability to complete pulmonary rehab. That's not acceptable. The answer I think going forward from a personal standpoint is to develop telemedicine, telerehab programs that work. For those of us who are new to telemedicine, a couple of months ago, I would never have thought there was much role in metropolitan areas, that it would have more of a role in parts of the country where there may be hundreds of miles between specialists, for example. I've changed my mind.

Dr. Byron Thomashow:

I think that telemedicine is going to be a large part of our future, that hopefully the technology will develop to allow us to make it more and more successful so that we can allow people to continue to live their lives and not necessarily schlep into doctors' offices all the time. That doesn't mean there will not be the need for in-person visits. Those will always continue, but they can, I think become more limited as we develop telemedicine.

Dr. Byron Thomashow:

I believe the future of pulmonary rehab is with telemedicine. I think our ability to take us from the one or two or three or 4% of people on rehab to much higher levels would depend upon developing telerehab programs that work. This is our opportunity to do that. Then we need to push to make sure that we get the reimbursement to make it possible.

Jamie Sullivan:

Great. Thanks so much for answering these questions. Again, if your question wasn't answered, we will do our best to work with our experts and medical advisors and get you responses next week. So, that's all the time we have for today. We hope you've been able to take away some practical knowledge and tips and I know I have and learn something new every time. So, finally, we'd like to take a moment to thank our partners who've provided critical funding for COVID-19 response activities and as Corinne mentioned in the beginning, in particular Theravance Biopharma, which has provided support for our webinar series.

Jamie Sullivan:

It takes a village and we're grateful for all of your support and for the companies who are allowing us to introduce these new research and services for you. So, with that, I will say thank you once again and close out for today.