

Dr. Leighton Chan

Behind the Mask

January 12, 2022

Barr: Good morning. Today is January 12, 2022. My name is Gabrielle Barr, and I'm the archivist at the Office of NIH History and Stetten Museum. Today I have the pleasure of speaking with Dr. Leighton Chan. Dr. Chan is the chief of the Rehabilitation Medicine Department at NIH's Clinical Center. Today, he will be speaking about his department's COVID-19 experiences and efforts. Thank you very much for being with me.

Chan: Thank you for inviting me. I'm happy to do this.

Barr: Definitely. When did you begin planning how your department was going to react to the COVID-19 situation back in 2020?

Chan: We started planning as soon as the hospital began to realize that this was going to be an issue. It was a long time ago, but if you remember, we went through various stages as the pandemic became more and more of an issue and more and more of a concern to all of us. Then, ultimately, we had to make some dramatic changes to how we did our business. We—along with every other department in the hospital—tracked the news very closely about these cases that had come out of China, wondering whether or not it was going to be an issue for the U.S., [then] realizing it was going to be an issue for the United States, and then it hit the East Coast early. I was in Chinatown in New York City, where my parents live, a couple of days before the first case was reported out of there. Then I came home, and I got very sick, so I thought it's a possibility I could have been infected very early on, but I don't think so. In any case we started with everybody else.

Barr: How did you prepare your staff for encountering the virus? It's a very contagious disease, and they don't always work with populations that have contagious diseases.

Chan: We had to really up our game in terms of communication. The rules and policies and recommendations around how to manage this new virus changed almost weekly. So, we went to literally once-a-week staff meetings in which we told people on Friday what was going on, and then I sent out emails every Tuesday as well, just to give them the latest updates. There was a lot of uncertainty—a lot of potential fear. Everyone didn't know, but we'd heard this was a deadly disease, and so the only way to calm people down a little bit, and also to tell them what they should and shouldn't be doing, was to send emails and communicate with them.

Barr: Can you talk about the efforts of the different kinds of therapists that you oversee, such as physical therapists and occupational therapists, in helping those with COVID-19 regain their strength and relearn how to do normal everyday activities?

Chan: Our department has about a hundred people in it. We have rehabilitation physicians—they're called physiatrists—who focus on improving patient function. We have a dozen or so. We have about a dozen or so physical therapists who help with patient mobility. We have a dozen or so occupational therapists, who help with activities of daily living. We have several speech pathologists who help with

communication and with swallowing. We have more than a dozen recreational therapists who help people maintain a stable, productive life within the hospital as much as we can. All those individuals have very close intimate contact with their patients. This is not a situation, in general, where a clinician can be across from a desk or behind some sort of instrument. They're very much hands-on, and so the risk of transmission both ways—from patient to clinician and clinician to patient—is as high as it's going to be in any other situation, because you have close, intimate, prolonged contact.

We started with masking and face shields—that's sort of the standard now—but it took us a while to get there based on access to care. In more high-risk settings, like individuals we're treating who we know have COVID, then individuals have to wear much more extensive PPE [personal protective equipment]. They'll put on a full Tyvek suit and an N95 mask, face shield, goggles, whatever, and that's a much safer environment—but very uncomfortable. That's the environment in which they're working.

Now, we haven't seen a ton of COVID patients. We're not an acute care hospital, so we don't see a lot of COVID patients, but we see a few. I actually run a post-COVID exercise trial. These are when patients are no longer infectious, but they're suffering long-COVID symptoms and deconditioning. We're running an exercise trial, which we can talk about later if you like. But we use the standard practices in all rehabilitation, which is to assess an individual's functional capabilities and see whether or not there are things that we can focus on to get people back to living their normal life—whether that's a strength issue, whether that's a mobility issue, whether that's a cognitive issue, or whether that's an emotional issue—because people can get very depressed if they are debilitated for long periods of time. So, we take a standard [approach].

Barr: Was speech very affected or impacted with those who were on ventilators for a long time? Can you speak a little about that?

Chan: Oh, absolutely. If you're on a ventilator for a long period of time, how do you communicate? You may be actively mentally aware. For individuals who are acutely intubated—meaning they're so sick that they have a tube right down their throat—those people are by and large pretty much sedated. So, communication is an important issue, but not nearly as important for somebody who has a long-term tracheotomy, which we don't see very often in this disease but it's certainly a possibility. Those individuals are awake and aware but have difficulty speaking. You have to retrain them to communicate by allowing them to move air up through their vocal cords—or, if that's not a possibility, use other alternative methods of communication, like through computers, sign boards, and that kind of thing.

Barr: Did you adopt any new techniques or approaches—or did you find that certain techniques or approaches worked very well with certain types of COVID patients?

Chan: I don't know that I can speak to that in great detail. We just haven't seen that many. But the standard approaches tend to work with this group of individuals as long as they are vaccinated, number one, and we can get access to the early treatments—which we didn't have at the very beginning. The monoclonal antibodies and a variety of others—remdesivir or other medications—for somebody who does get infected can positively affect the course of their illness.

Barr: How early do you and your therapists get involved in a patient's care?

Chan: For our protocol, we like to see them when they're no longer infectious. The number of days on that has changed. Early on we really didn't know how long someone was going to remain infectious.

Now, we're down to seven to five days, depending on the expert that you talk to. In our protocol, which was written over a long period of time, we enroll people a month after they were exposed and got their positive tests. That's the earliest point that we'll look at them. We want some time to pass after their acute illness, so we're convinced that they actually need exercise. Some people recover quite well and don't need it, others are suffering sort of this long-COVID illness and need something to get them back to their lives.

Barr: Can you talk a little bit about rehabilitation of patients with neurological issues? That's been an interest of yours in the past, and that is a possible side effect of COVID. How have your therapists been dealing with that or any long-COVID?

Chan: As part of my research areas of interest, we have been focusing on traumatic brain injury and have done some interesting work looking at the impact of exercise and increased heart rate in patient recovery. One of the ideas here is that part of what goes sort of wrong after traumatic brain injury is that the vasculature in the brain doesn't react like it normally would, and it tends to perhaps contract a little bit more than it should at times when it shouldn't. That can cause abnormalities in brain function. By increasing the vascular stress in the brain gradually—by encouraging people to exercise to the point at which they get symptoms—you can gradually increase the response of the vasculature to stress.

Barr: What kind of exercises?

Chan: It can be anything that gets your heart rate up. Most commonly we use treadmill training because we can monitor that really closely, and it's pretty easy to judge how fast somebody is going and at what incline and what their heart rate is. But for people out there, any type of exercise—walking, running, jogging, biking—anything that gets your heart rate up. Just take it to the level where you might have your symptoms after a brain injury, so whether that's sort of a headache or nausea or a little bit of mental fog or dizziness—those are the most common things that we have people back down on. So, that's the idea.

Barr: So you're applying that to COVID?

Chan: Yeah, absolutely, although we don't know what the mechanisms are for long-COVID. We have an idea with brain injury. We think it's this vascular mechanism. With COVID we don't know, because as far as anybody knows, COVID doesn't make its way into the brain, so it doesn't cross the blood barrier. But people do have these long-COVID symptoms and one of the major complaints is this cognitive fog and fatigue, which you see in a lot of other atypical responses to disease, like chronic fatigue syndrome or other things. NIH is also studying those as well, although I'm not as involved in those projects.

Barr: Has your department done anything in retraining COVID patients who've lost their smell and taste?

Chan: No, we don't do that. Although the person you should talk to on that would be Brian Walitt or Bryan Smith, both in NINDS [National Institute of Neurological Disorders and Stroke]. Avindra Nath is running a post-COVID trial, a long-term study. They look specifically at loss of smell—not sure about taste, but definitely loss of smell. I don't know of any novel treatments for that—it's sort of just wait the tincture of time and allow the neurons to regenerate themselves. Unfortunately, I guess in a small percentage it doesn't come back. Obviously, that's concerning.

Barr: Has your department incorporated telemedicine or any other technological approaches, even though that's obviously not ideal for those that work in your department?

Chan: That's one of the silver linings of the COVID epidemic—that it forced a transition for medicine to go into telemedicine faster than it would have ordinarily. I'm actually a big proponent of telemedicine situations. It allows us to reach out to patients more frequently and to see how they do in their home environment. When they come into the hospital, it's a big deal. Obviously here it carries the added risk of both patient and/or clinician transmitting the disease. To bring somebody in, you've got to be really sure you need to see them. Very often, you can achieve most of your communication goals through telemedicine, and so we've been using it a fair amount with our cases. We probably have more frequent follow-up. We do telemedicine for exercise as well, so we're able to have people not have to come into the hospital to do their exercise trial. They can actually do some portions of it at home, and we can monitor them. It's safe and it's certainly much more convenient for them. And then we get to see them in their home environment—which is very different than seeing somebody in the hospital.

Barr: Do you make recommendations when you see their home environment on the screen? Maybe they need another surface area, or something is unsafe.

Chan: We can do most of that on an in-person visit when somebody's being discharged, but yes, absolutely. That's certainly one of the added benefits because you can see that person's house rather than having them just describe it.

Barr: How have you balanced caring for COVID patients with those that have a lot of other types of conditions that you have continued to see?

Chan: There's no question that the pandemic has reduced the number of active protocols—and in some cases dramatically reduced it. At the height, or certain times—just like right now for instance—we've reduced the number of elective procedures and elective admissions down to sort of bare minimum, so we're not bringing patients in and exposing clinicians or [having] the patients themselves getting exposed in their travels here. There's no question that things have slowed down, but they haven't stopped. There are certain trials that have kept going. A couple of mine have kept going just because from a scientific value it's worth the risk to keep those patients going. For individuals in cancer trials where chemotherapy is needed or a surgical procedure is needed, without which somebody may suffer grievous harm, then that's an individual you want to keep bringing in. If it's a routine follow-up for something that could be done through telemedicine or delayed for a couple weeks, then we do that.

Barr: What have been some of the challenges that your department has encountered to date due to COVID?

Chan: Oh, enormous numbers of challenges. Obviously from a technical standpoint we had to change how we do business. We had to change obviously by simply wearing all the PPE. We had to change how we related to one another, to keep social distancing appropriate. We've moved many of our staff meetings to virtual Zoom meetings, so instead of meeting person to person and having face time, we had to do all that. Then, like everybody else, we all have our own private lives. We have kids who are in school, or we have aging parents who we worry about. We have friends and family who we want to see—all that stuff. So, it's been two incredibly long years and keeping up staff morale is a full-time job.

Barr: Can you talk a little bit about that because a lot of your staff is directly on the front line? How have you bolstered their morale?

Chan: Number one, they are a resilient bunch to begin with, so we've been lucky. The people we've selected and the section heads we've got are a fully committed long-term crew that gets along pretty well and understands the mission of the Clinical Center. They're willing to do whatever it takes and I'm so proud of them for that. But we understand that people go through stuff. We've had deaths in the family, we've had people who have come back positive, we've had family members who get sick—and we just have to adjust on a one-on-one basis and make sure that we can still get the job done. Other people have been able to take up the slack, so there's only been a couple of days in which we were in the yellow. Red means that you can't really do your job because there's not enough staff or some piece of equipment is missing. Yellow means you're on the bubble—you're going to worry about it. And then green means you're fine. We've almost always been green—sometimes yellow. I think we had a day or two in red because we couldn't get access to walkers because of supply issues, or because all of a sudden, a bunch of people called out—but that didn't last very long. I credit the hospital leadership for a lot of that because they have been studiously managing the census, opening the spigot or closing it based on how stressed the staff were from an attendance standpoint or based on how sick people get. We've done pretty well. We'd platoon for a while early on, meaning half the staff would be in one day and half the staff would be in another. We did that because if one person got sick and potentially exposed others in that particular platoon, then that platoon would be out, but we'd still have another group that could come in and fill the gap if needed. So, we did that for a while with the physicians in the Clinical Center.

Barr: Do you have rounds with the physicians in the Clinical Center, or do you all just do virtual rounds now?

Chan: We don't round in large groups. That's never actually been one of our things. We do participate in other large rounds, but those have been cut back. We do our multi-disciplinary meetings mostly online to keep the exposure down.

Barr: What have you and your department learned over the course of approximately two years, and in what ways do you hope to further advance?

Chan: I've learned as a leader the value of good, consistent, honest communication with staff. I've been at the shop now for I guess almost 15 years and got pretty used to doing things in one particular way. COVID forced me to change that—in particular how I communicate with staff, how frequently I communicate with staff, what I talk about, how important it is, and how I respond. With COVID I had to do it on a daily basis with the staff leadership, and with the staff as a whole at least now twice a week, where I wasn't doing that before. I've seen value in that beyond just COVID. That's one of the things I've learned. We've learned to expect the unexpected and also how resilient we are as a department. We've had a lot of stuff thrown out at us and we've done pretty well, so I think we can come out of it with a fair amount of self-confidence that, given another challenge, we'd probably be okay. Those are some of the lessons I've learned.

Barr: As someone who has an interest in working with those with rare lung diseases, what have you found particularly interesting about COVID-19?

Chan: Well, we're still learning. We've enrolled maybe a dozen cases in our protocol. The difficulty for us is the people who come down with COVID and get pretty sick—sick enough to come into our trial—are usually individuals who were either unvaccinated or unvaccinated and had a lot of comorbidities. So, it's making it difficult for us to sort out how much of the odd stuff we're seeing in this patient population is due to their pre-existing comorbid illness or how much is due to COVID. We had a patient the other day who jumped into an abnormal rhythm—which we haven't seen much in any of our cases. Is that something that individuals with COVID now are more at risk of, or just because this individual would have developed it in any case?

Barr: How many people do you hope to be part of your protocol? Can you talk more about your protocol?

Chan: We hope to have about a hundred. Our protocol looks at individuals who have gone through COVID, whether or not they were vaccinated, and still have problems with functional limitations. They can't do certain things because they have problems with fatigue, mostly, and weakness—sort of long-COVID type symptoms. There are long-COVID clinics popping up all over the country because obviously this has become a pretty big clinical issue. We bring them in, and we gradually introduce exercise. There are two arms—there's a control arm where they get education and then we gradually introduce exercise over a several week period. They get about 30 episodes of exercise training over probably 10 or 12 weeks, and then we compare how the education group did compared to the exercise group. That'll give us a sense of the impact of aggressive exercise training for this patient population. Our main outcome measures are how somebody's heart and lung work. That's number one. Also, how far they can walk. But then we have all kinds of other secondary outcome measures like the quality of their life, functional capabilities, whether they are back to work, what their mood is like, if their depression has lifted, and what kind of medications they're taking. That's the idea behind the protocol. It's going to take a while—at least a year, if not more, to get enough patients through, but this pandemic continues, and with the latest Omicron surge, I suspect we'll get a lot more interest in our protocol because I think we're going to have a lot of new patients.

Barr: Have you seen any differences on how the different variants affect the patients or not so much?

Chan: I'll be honest with you; we don't have that level of information. All we have is a positive PCR test. We don't have genetic testing on the virus itself, so I can't answer that question. We know from what the research is telling us—not mine but others'—that the Omicron variant is much more transmissible, but perhaps doesn't get as deep into the lungs and stays higher up in the bronchus and in the oral pharynx. So, the mouth and the throat as opposed to down in the lungs where damage can be much more dangerous. You have fewer people hospitalized and fewer deaths. It doesn't mean you can avoid a vaccination if you don't want to get sick. People will still die from Omicron; it's just going to be a smaller number.

Barr: In addition to being a scientist and a physician, you're also a person who's living through the pandemic. Personally, what opportunities and challenges has COVID-19 presented for you?

Chan: I have two young kids, so like any other parent, trying to navigate schools opening and closing based on COVID restrictions is very difficult. Lately, it's been staffing issues. School busses over the last couple of weeks have been very erratic because the school bus drivers themselves are getting sick. So, you never know. They don't call in until first thing in the morning, so you never know when your bus is going to show up. There's that issue, which is just managing school. Then my son Josh has special needs,

and he did virtual school almost all last year—so did my daughter—so that was very, very difficult. That took its toll on the kids emotionally and on us as parents—to try to work and manage their school virtually as well. Then I have my elderly parents—they're both near 90—and we didn't get to see them very much because we didn't want to expose them. Until the vaccines came out, we didn't see them much at all—so we went over a year without seeing much of my kids' grandparents. That was difficult. I haven't had a vacation in two years—you know, a true vacation just for myself. It's always been something around family—we did take some time off in Vermont. But just to go see my buddies to go skiing or go fishing, I haven't done that in a couple years. That has been a disappointment and a struggle. Those are all the things that are problems. Now what is the bright side? There are a lot of people who struggle in many ways. People have lost jobs; a lot of people have lost homes. A lot of people have had a much tougher time than I ever will, and so I do feel lucky and privileged to be living here in a pretty safe environment with the ability to keep myself and my family safe. And then unbelievably proud to work at NIH, which in many ways has been a beacon of hope for the entire country, despite the way that politicians have politicized science. If you take a pretty unpolitical view of what NIH has achieved and what we've helped to create for literally the world, there's no denying that the work of NIH has saved millions of lives. To be part of that is just something to be incredibly proud of.

Barr: Definitely. Is there anything else that you would like to share about your COVID-19 work or experiences?

Chan: No, I don't think so. You've tapped me out. It's been a real pleasure talking to you. Thank you for doing this. I look forward to seeing the edited version.

Barr: Thank you for all your service.