

Speaker 1: [00:01](#) Quality Improvement in the Time of COVID-19 is brought to you by the American Heart Association with support from Novartis Pharmaceuticals. As physicians, scientists, and researchers worldwide struggle to understand the COVID-19 pandemic, the American Heart Association has developed its COVID-19 CVD Registry powered by Get With The Guidelines to aggregate data and aid research on the disease, treatment protocols and risk factors tied to adverse cardiovascular outcomes. For more information, visit us at heart.org/covidregistry.

Sandeep Das: [00:32](#) Hello and welcome to our American Heart Association Podcast series on COVID-19 and cardiovascular disease. The American Heart Association has built more than 20 quality improvement programs based on the premise that patient outcomes improve when medical professionals follow the most up-to-date evidence-based treatment guidelines. The challenge of COVID-19 is maintaining consistency and treating the standards for existing conditions and diseases, as well as understanding the novel virus' impact. Together, we're going to examine these challenges more closely and hear from experts on how quality improvement is playing a role in the current COVID situation.

I'm Sandeep Das, a general cardiologist at the University of Texas Southwestern Medical Center in Dallas with a primary research focus on quality of care and outcomes research. I'm also co-chair of the steering committee of the AHA COVID-19 CVD Registry. Today, I'm here with AHA president and leading stroke researcher, Dr. Mitch Elkind to discuss the impact of treatment delays on cardiovascular outcomes during the current pandemic and the American Heart Association's new Don't Die of Doubt campaign. Dr. Elkind, would you please take a few minutes to introduce yourself to the audience?

Dr. Mitch Elkin...: [01:39](#) Sure Sandeep. Thanks. Great to be here. My name is Mitch Elkind and I'm a stroke neurologist and epidemiologist at Columbia University in New York. And as you said, currently, the president of the American Heart Association. So thanks for having me.

Sandeep Das: [01:54](#) Great. And thanks for being here. Appreciate you taking the time. I know you're super busy. I think we should start with the elephant in the room. So during the COVID-19 pandemic admissions for other cardiovascular emergencies like stroke, seem to have fallen sharply. Can you give us some sense of the scope of this drop-off and tell us your take on the implications of potential delays in diagnosis and treatment on cardiovascular outcomes?

Dr. Mitch Elkin...: [02:16](#) Sure. So that's obviously been a huge concern. We've seen a decrease by about 20 to perhaps as much as 40% in the number of people who are going to emergency rooms for acute strokes. And I think the numbers are similar for heart attacks as well. So that's a pretty dramatic drop-off and it depends a little bit where in the country the pandemic is at its peak. Certainly in New York, where I practice, at New York-Presbyterian Hospital, we saw dramatic declines during the height of the pandemic back in March and into April and into May as well. And other places in the country, I think are now seeing those same kind of drop-offs. And this was seen internationally as well. People in China reported it first and then in Spain and as it moves across the globe into the United States, we've encountered that as well.

And this is obviously a big concern because we don't think that strokes and heart attacks are going away just because there's a pandemic going on, but we're concerned that people may not be activating EMS, calling 911 and getting themselves to the hospital. And there are a number of reasons for that occurring I think. Fear of going to the hospital is probably one of the leading causes. There may be other reasons as well, but the risk would be that if people delay treatment, their disease may be worse by the time they do get to the hospital and then their long-term outcomes could in fact be worse.

Sandeep Das: [03:53](#) Yeah. And so just to give the audience a bit of a sense of the scope, so at a fairly busy hospital in Dallas, our peak was just shy of about 200 patients with COVID at one time. Can you give us a sense of the bigger hospitals in New York, how many they were handling?

Dr. Mitch Elkin...: [04:07](#) Well, again, in New York at the height of the pandemic, our entire hospital was practically dedicated to COVID. I can tell you, for example, our stroke service became essentially a COVID service for a number of weeks. And we in fact, had to expand the hospital beyond our usual patient availability because of the pandemic. So we had operating rooms converted into ICUs, and we had an overflow area outside in the Columbia football stadium. We had tents set up to take care of patients there as well. Our New York-Presbyterian Hospital system, which includes a few different campuses, including both Columbia and Weill Cornell had altogether about 9,000 or 10,000 patients with. So it was quite dramatic and other hospitals in New York City were similarly facing that situation. So Mount Sinai and NYU and the public hospital system in New York as well. So I think New York was hit in a particularly strong way. Fortunately, I

think other cities learn from that experience and have been able to handle the burden just a little bit better.

Sandeep Das: [05:20](#) Yeah. It's just it's stunning to me. I mean, my respect to you and your colleagues for the heroic work you did. As busy as we were, it was very busy. It was manageable, but really busy. And I can't even imagine how it must've been with the volumes that you guys faced. So tremendous amount of respect to you and all your colleagues for the work that you've done clinically.

Dr. Mitch Elkin...: [05:39](#) Well, let me just say that I think kudos really are due to our trainees who bore a huge brunt of that effort because many of them were taking care of patients that they had not really been trained before to take care of. And they had to learn on the fly. And they really stepped up and did a phenomenal job. So without very committed residents and fellows, I think it would have been a lot tougher.

Sandeep Das: [06:04](#) Absolutely. So what do you think are the main reasons that people don't want to come in? Is it just simply fear of being exposed?

Dr. Mitch Elkin...: [06:10](#) So yeah, it's an interesting question. I think that probably is the main reason. And in fact, the Heart Association commissioned a Harris Poll, which found that about a quarter of people said that if they were experiencing a stroke or a heart attack during the pandemic, they wouldn't call 911, they wouldn't go to the hospital, which I thought was a really high number. And interestingly, among black Americans and Latinos, the number was even higher. Something like a third or more of people said they wouldn't seek emergency help in that setting. So I think that fear of going to the hospital is a big part of it.

Some of it could also be due to sort of the desire not to overwhelm the healthcare system. People are watching on television, they're watching the stories of doctors in the emergency room and the ICUs just being overwhelmed as they were in New York, back in the height of the pandemic. And they may feel that, I'll wait it out at home or what I'm going through can't be as bad as what people, doctors are dealing with and I'm not going to bother them. So I think that's a piece of it as well.

And then, you know Sandeep, for stroke, it's a little bit different than it is for heart disease, right? When people have a heart attack, they're generally going to feel pain, they're going to feel uncomfortable. They're going to call out for help. They can even pick up the phone and call somebody and tell them about it. But

one of the main characteristics of a stroke is that people may specially large strokes they may not be able to speak, or they may not be aware of their deficit if it's a big right hemispheric syndrome. And so many people may not be able to call for help and they need to be witnessed.

And during the time when people are socially isolating, on lockdown, they may not be witnessed to have a stroke. And you could imagine that many of us, I think we're concerned about seeing our parents or our grandparents. And so they would be alone during that time. And so we think some people believe were missed in their strokes and may have even died for that reason. So that would be a concern, I think.

The final reason, which is sort of an interesting one, perhaps scientifically, is this idea that there was a lot less air pollution, right? People weren't driving, they weren't going to work. And so air pollution we know is an important risk factor for stroke and cardiovascular disease. And so the decrease the bad air pollution and other forms of pollution, industrial activity could have lowered the actual rates of stroke. And I think that's an interesting hypothesis, but we haven't really seen convincing evidence that that's the case. And in fact, in England, the study was done to kind of look at that and they didn't find that to be a major reason, but I think that's something we want to keep an eye on as well as sort of a natural experiment.

Sandeep Das: [09:10](#)

So that's super interesting actually. I hadn't thought about it that way, especially with the differences in symptom presentations for stroke versus heart attack. To sort of explain the importance here, can you comment on how important timely revascularization is in stroke? What effects would delays be expected to have on outcomes? How important is timely revascularization in stroke and heart attack? What effects would delays be expected to have on outcomes?

Dr. Mitch Elkin...: [09:36](#)

Yeah, well, just like in heart disease, in the world of stroke, the more quickly people are treated the better the outcomes, the less the ultimate damages. So the concern would be that for a patient with a stroke or a heart attack, that if they come in later, there may be greater damage to the heart or the brain at the time they're treated or potentially they could miss the window for treatment altogether and have a significant injury. So, in the world of stroke, things have evolved in the last, just last few years, really.

We got EPA for acute stroke back in 1996, but our time window was only three hours. And then several years later it was extended to four and a half hours based on available trials. And then in 2015 we received a number of clinical trials that demonstrated the benefit to thrombectomy in patients up to six hours. And in just the last couple of years, that window has been extended out as far as 24 hours in selected patients. And so we have a good long time window now to treat people, but even so, as we always say, time is brain, the longer you wait, the more damage will occur. And so it's really important that people get treated quickly.

One interesting thing that has emerged from the pandemic and I followed the stroke literature more closely, but we've seen that in places that were affected, for example, in Spain and then in New York, that the quality of care metrics. So time to treatment and time to join puncture for thrombectomy for example, those times are stable during the pandemic. In other words, we're able to maintain the quality of care for patients who do come in. And so it's really important that people do remember to call 911, to come into the hospital, shorten that interval because the safest place to be when people are having a stroke or a heart attack is in the hospital and we can provide safe and effective care once people get there.

Sandeep Das: [11:43](#)

So along those lines, maybe this is a great point to segue into a little bit about the mission of the Don't Die of Doubt Campaign and how that campaign aims to have an impact.

Dr. Mitch Elkin...: [11:53](#)

We want people to remember that we've learned a lot about how to keep people safe during this crisis. Most hospitals are able to effectively separate patients who might have COVID from patients who may have other acute conditions that need to be treated differently. We've all learned a lot about the use of personal protective equipment and hand-washing and wearing of masks. And so all of that I think should make people feel comfortable just as they would have before the pandemic. That if they're experiencing symptoms of a heart attack or stroke, they should call 911 and they should get to the hospital immediately.

You know, I'll just say one other thing. Back in the beginning of the pandemic, I guess it was probably, just in mid-March or so, I run a clinical trial called ARCADIA. And as we were shutting down our research temporarily because of the pandemic, we were trying to also give patients information about what they should do to stay safe. And at that time we were all saying,

don't wear masks. That if you wore a mask, it would lead to touching of the face, and that can be higher risk than wearing a mask. And I think back to that now, and how kind of misguided that message was because now of course we know how important masks are. And so what we've been trying to do is educate patients in our trials, educate patients in the outpatient practices about the best ways that they can keep themselves safe during the pandemic, and then in the event they should have an acute problem.

And one other aspect of that, I think is that for people who are potentially going to be alone, it's important for their family members to know, to check in on them FaceTime, whatever means possible to make sure they're okay, so that if something does come up, they can get them onto the hospital immediately. So Don't Die of Doubt really says, don't wait it out if you think you're having symptoms of a stroke or heart attack. Seconds count, get to the hospital immediately.

Sandeep Das:

[14:04](#)

People, especially people who are alone, they may be unresponsive or unable to talk or else they may have subtle symptoms that other people might notice. And if they're alone and not interacting, that that can get missed. I hadn't really thought of it that way before, but it's a great point. Definitely makes stroke management even more challenging than heart attacks, which at least they usually present with some symptoms of chest pain or something like that, that at least clues you in.

You alluded to the fact, our guidance is changing. You specifically mentioned masks. One of the things I think that has been frustrating to the public is the sort of variability and guidance where it goes from no masks to masks to, is it airborne? Is it fomite spread? Is it respiratory droplets? And where recently a lot of people have publicly discounted the severity of the pandemic saying that poor outcomes are mostly confined to people with extensive co-morbidities or very advanced age. What's your take on that? If you're a middle-aged man or woman who's generally pretty healthy, maybe carrying a few extra pounds, some little mildly elevated blood pressures, are you pretty much safe?

Dr. Mitch Elkin...:

[15:06](#)

Well, unfortunately I think not. And to be perfectly honest, many of us are carrying around our own COVID-19 at this point, having been working at home and not getting the exercise that we need. And I certainly put myself in that category too, but cardiovascular risk factors, things like high blood pressure,

diabetes, obesity, all increase the risk of adverse complications. We know that certain race, ethnic groups, black Americans, Latinos are at two to three or even higher times risk of adverse outcomes with COVID.

So all of those factors increase the risk, but I think we shouldn't allow that to make people think that if they don't have those characteristics, that they don't have risk. Something like 6% or so of people who are hospitalized with COVID don't have other conditions, but that doesn't mean that they're scot-free. We know that people who are otherwise perfectly healthy can have severe complications. I've seen young people have strokes without any other apparent mechanism or cause than COVID. And we've seen young, healthy people even die from this disease. We've seen children who can be severely affected or die. So I think it's important to remember that nobody is spared, even though all of those adverse risk factors can increase the risk yet further and markedly in many cases.

Sandeep Das: [16:39](#)

When the numbers get very, very large, then decent percentage of an incredibly large number is going to be an incredibly large number. One thing that you have mentioned a couple of times is the disparate effect on communities of color and how black Americans and Latinos, may be more likely not to present with their stroke and heart attack. And do you think that's related to the higher sort of impact of the disease in those communities? Are people feeling it more viscerally because they may know someone that's been hospitalized or died from COVID?

Dr. Mitch Elkin...: [17:11](#)

Well, it's probably a combination of factors. So I think certain race, ethnic groups may be an imposition for employment reasons. Socioeconomically, they may live in more crowded housing areas. They may need to go to jobs that put them at increased risk because of interactions with others. So that would be one piece of it. And then I think on the other side, once people become ill, we know that those populations are also at higher risk of the other cardiovascular diseases that increase their risk of complications, right? So we know hypertension is much more prevalent in African-Americans. The incidence of stroke is more than twice as high in black Americans that will white people. And so I think they're both at a higher risk of getting the disease and at high risk of worst outcomes afterwards. And that I think is a very challenging combination.

So I think educating those communities is particularly important for those reasons. And as we've all known and seen and said

many times, the pandemic is really exposing a lot of the weaknesses of our healthcare system. A lot of the inequities and disparities that were present beforehand are just brought increasingly to attention in a very dramatic fashion because of the pace at which the pandemic occurred. So, we were in the midst of a pandemic before and this just got much worse. In fact, somebody recently referred to this as a syndemic, which means we're not just in the midst of one pandemic, we're in the midst of a number of pandemics, one of which is social inequities that compound.

Sandeep Das: [18:54](#) Definitely leaps out to me that the disparate impact of the virus on communities of color, especially black Americans and Latinos, is really one of the, sort of the signature hallmarks of this pandemic. And then anything we can do to mitigate those disparities is essential.

Dr. Mitch Elkin...: [19:11](#) Yeah. And if I could, I would make the additional point that American-Indians and Alaska Natives also a dramatic, I think even the highest rate five times we've seen in white population. So the numbers of people may be smaller, but the impact of the virus is even greater in some of those communities.

Sandeep Das: [19:28](#) Yeah. Absolutely. So that's actually a great point. I'll admit to being biased because I do a lot of my clinical work with the urban poor in Dallas, which is mostly Mexican-American and black American communities, but you're right, absolutely. That the numbers in that Native Americans have been striking. So the neurologic effects of this coronavirus seem different to me and more problematic than neurologic complications in the context of other viral infections. Can you comment on the type of complications you're seeing and is this virus really different or is it just more of the same?

Dr. Mitch Elkin...: [20:00](#) Well, that's a terrific question. I'm glad you asked that Sandeep. So, I've actually spent a lot of my career investigating from an epidemiologic perspective, the effect of infections on stroke risk. So we've looked at influenza and sepsis and just being hospitalized for kind of admission different to infections and found in different cohorts and using different methods that indeed other types of infections are associated with a short-term increase in risk. So kind of a triggering effect for stroke. And of course there's a literature on this for heart disease as well.

There was a really interesting analysis that was done by my colleagues at Weill Cornell led by a junior faculty member

named Alex Merkler, which looked at the Weill Cornell experience during the height of the pandemic. There were something like 2,000 patients with COVID and a small number of patients had stroke. It was about one and a half percent who had stroke. But the interesting thing was that they compared that to the risk of stroke in patients with flu from prior years. And they found that the risk of stroke after COVID was about seven times as high as after flu, even after adjusting for other factors.

And so there does seem to be something specific about this virus. And there's a long conversation, obviously we could have about mechanisms and so forth, but the effect of the virus on endothelial cells, or at least the von Willebrand factor, the thrombo inflammation that occurs and increased tendency to clotting all of these things, I think contribute to a higher risk of not just stroke but also heart disease, DVT, pulmonary embolus, a lot of vascular complications. So that's on the kind of stroke side. And yes, I do think there's an increased risk.

You're right that there are a number of other neurological complications, many of which are not even stroke, right? So we've seen people have syndrome Guillain-Barre, which is an acute demyelinating neuropathy, which has been associated with other viruses in the past as well. We've seen other kinds of encephalopathy and encephalitis occurring in patients, there have been rare reports of people with severe hemorrhagic encephalitis, but there are a number of other things happening due to this virus, which again, probably reflect the inflammatory reaction in the peripheral nervous system or elsewhere.

And we've only known about this virus for six months now, and we're learning more every day it seems like, and I think we'll continue to do that. And the next thing that I think we're going to keep our eyes open for, we should be keeping our eyes open for is what are the long-term complications of it? Is it possible that some of the things that happen acutely and have long-lasting complications, and that's why it's so important that we proactively, I think that registries and so forth that attract that issue as well.

Sandeep Das:

[23:09](#)

You mentioned that long-term complications are not yet fully appreciated. One of the thing that's getting a lot of attention right now is this sort of subclinical myocardial inflammation, myocardial injury, that's only detectable by patient's cardiac MRI in otherwise asymptomatic patients. And that this may have potential implications for long-term cardiac outcomes for

functional status, et cetera. Is there an analog in the CNS space, or do you have any comments on either the myocarditis or on the potential cerebrovascular involvement?

Dr. Mitch Elkin...: [23:41](#)

Yeah, no, that's a really good question. I mean, I think you hear people who have long-term brain fog, some decreased attention or concentration, some cognitive issues afterwards, and they're usually subtle. I think the vast majority of people do recover neurologically. Some people may have a stroke and that obviously could lead to long-term effects. Thankfully, the actual incidents of stroke, as I mentioned before, one and a half percent at Cornell, and in the studies that have been done, it's no higher than 3% who have a stroke. So I think most people recover. But the question is to whether some of those people who have these kind of vague neuropsychological problems, is that something specific about the virus or is it what you might see in anybody who had a critical illness or was acutely hospitalized.

We don't know the answer to that yet. We don't really have, I don't think the equivalent imaging studies of the brain long-term in people who've recovered that you have in the myocarditis instances, particularly I think among athletes, right? So a lot of collegiate athletes, that's where some of this work has been done that has shown the lingering myocarditis or other evidence of heart injury. We haven't had as much of that in the neurologic space yet, but of course people are concerned about that and exploring that possibility as well.

Sandeep Das: [25:10](#)

Awesome. Well, thank you so much. I appreciate your being with us and taking the time. Did you have any sort of parting thoughts, anything that I didn't ask you that I should have, or any other points that you want to make for our audience?

Dr. Mitch Elkin...: [25:22](#)

I would just say that I think it's important for people to really, because I know we're talking to a group of quality improvement and quality assurance experts in hospitals that are involved here. So I think that we really should be trying to educate our communities as much as we can around ways to prevent the spread of the virus, things that we discussed, like wearing masks, making sure to check in on people who may be ill and maintaining social distancing and so forth as well as the importance of seeking help when acutely ill, because people should know that if they're having a heart attack or a stroke, the safest place to be is in the hospital. So thanks, Sandeep. I really appreciate the conversation today.

Sandeep Das: [26:04](#) Thanks very much. So do I. From my standpoint, it was really useful for me to hear the comment about the different symptom pictures. I think it's one of those things obvious in hindsight, but you don't necessarily think about it. So that's good, especially in the context of families with older relatives who may be isolated. That's important. I did like that you dropped in at least the one minor positive that the decrease in air pollution may not be having some positive effects, which is kind of nice if you want to find glass is 1% full kind of answer here. The disparate effects of community color, I think is also important to re-emphasize and to say constantly be thinking about. And then finally, I think the key message that Don't Die of Doubt. If you're having symptoms, get them checked out. If you're having an emergency come in, it's safe, we're ready. We'll take care of you.

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