CP: Welcome to season 3 of TechNJ - I'm your host Craig Parker. Spring has sprung, and I'm taking advantage of this fresh air and grabbing some exercise. Like many other people, I'm the proud owner of an activity tracker, or fitness tracker, and I'm working on putting it to use today. There are a variety of these handy devices and apps on my smart phone - all designed to monitor and track fitness-related metrics, such as your heart rate, distance walked or run, calorie consumption, and even quality of sleep. These wearables also fall under a relatively new category of healthcare called telemedicine, which is what we'll be discussing today. According to the American Hospital Association, there are currently about 65% of hospitals using telemedicine to consult with patients and other doctors, and that number is only growing. Some predict that by 2020, eVisits will exceed in-person doctor visits, and since New Jersey is number one for the fastest internet, we are in an excellent position to use this technology to enhance the health of our residents. But, there are some security issues lurking in the shadows of this new technology. Luckily, today's episode features two special guests to chat with us about the pros and cons of telemedicine. First is New Jersey Health Commissioner Dr. Shereef Elnahal, who will discuss a bit more about what telehealth and telemedicine is, as well as the benefits and current practices in place for this new technology.

SE: Just to level set on what telehealth is, it's an opportunity to see a healthcare provider - it could be a nurse, it could be a physician, it could be another type of a professional - that you would normally see in an office, but in the palm of your hands on a phone or on a computer. And it's the same type of video conferencing technology that many people use on a daily basis like FaceTime and Skype. It's often equipped with other technologies that allow a physician or provider to examine the patient, and otherwise get information that is needed to make a clinical decision, and make a plan of care. So, that's already being used for a lot of things in New Jersey, like mental health, primary care, women's health visits, and other types of healthcare visits. Telehealth is a really important tool - that really helps with healthcare access. Folks that live far away from a clinic or a hospital, a lot of our disabled population, also the elderly because it's often more difficult for them to get transportation and show up in person for visits whether it's due to their health reasons or access to a car and a number of other issues. The technology can be over your phone, over your computer, and for many types of healthcare visits you get the same value in interacting with a healthcare provider telephonically and through video-conferencing technology. It also helps to reduce costs. The maintenance and the cost it takes to run an in-person clinic are often higher than the ability for folks adjust interact via teleconferencing, and you can come up with business models for folks on their downtime if they like to see a patient to be able to do so with telehealth technology. So there a lot of innovative

companies that are getting more healthcare providers on board, and of course patients like it because of the convenience.

Some folks have cited a risk around security. If you have medical devices, for example that interact remotely with companies that are helping you manage your disease, like pacemakers - you can test pacemakers now remotely from thousands of miles away - there some concerns that, you know, is that technology hackable?

CP: And, who better else to discuss security aspects of this technology than Chris Rein, Chief Technology Officer for the State of New Jersey.

CR: Technology brings us advances, and it also brings us concerns, and we're not only seeing this in the area of medicine and health, but in many areas. No application in any domain can assert that it is hack-proof. It's a matter of taking proper precautions, using best practices, and remaining current with all security policies and procedures that are involved. Let me give you an analogy; If we have a set of sensors on the side of a road, which they're all over the place, for traffic monitoring, traffic congestion, and traffic pattern control. So, if you look at the confidentiality, integrity, and availability - those CIA, those are always the three elements that you consider for any cyber or privacy concern. So, in this particular case with the transportation sensors, and that technology, the confidentiality factory is fairly low. Who cares who knows what light turned green or red, or how many cars per second go past a given intersection? However, the integrity of that data, and the fact that that traffic light's availability, it must be on 24/7 all the time, those are high. Now, move over to telemedicine, all three are off the charts, right? It must be confidential, it must have data integrity, it can't have incorrect data being reported back to your heart or your brain in terms of controlling some of these devices, and the availability - well, of course. We all live 24/7, whether we're sleeping or awake. So, that's what sets the data and the technology aspects, I think, of telemedicine and these technologies - that's what set that apart a little bit from other domains. Sure, your refrigerator can now be hacked, but is it going to end a person's life? Is it going to create personal safety... probably not. There's a recent article in the, I believe, the New York Post, where they talked about this particular medical device and the implants. They also go to mention how there was no authorization and authentication used on this device. Not dissimilar to how you would operate your cell phone, your mobile device, or any other piece of technology where there were no methods of protecting the users not only identity, but their access means for this device, that led to the risk here. In considering the applications of telemedicine, one really must understand how it's essential for some means of authentication, credentialing they call it, or authorization for either a device, a device manufacturer, a medical professional to have proper access to that device.

CP: Another aspect to telemedicine and telehealth is mHealth. Here's Commissioner Elnahal to explain exactly what mHealth is.

SE: mhealth is where folks are using applications, as you mentioned, for self-care and self management, and there a lot of diseases where you need daily attention, as a patient, to your

own disease in order to prevent bad outcomes. Diabetes is one example, actually I have type 1 diabetes myself. An application that reminds you to check your blood sugar, that helps you count the carbohydrate content of your food, that says, you know, that you're projected to have a low blood sugar overnight, we recommend you take a cookie or snack, all of that will help with daily management of people's conditions, and that has benefits not only for quality of care and outcomes, but it keeps people out of clinics and hospitals if they don't need to go. And so you're talking about not only benefits to people's health, but overall cost of the healthcare system which really benefits everyone because that lowers insurance premiums. So the potential of this technology is unlimited almost, and what we need to do is make sure we design the applications in a way that allows for adoption, and gamification is one way to do that. NurtureNJ is the state's initiative, led by the First Lady, to restore maternal and infant justice to folks across the state, and that includes not only improving outcomes in black infant mortality and overall maternal mortality and morbidity, but reducing the striking disparities that we see with black New Jerseyans in the general population. We actually have already started to use technology that we've been talking about to stem this effort. We had a code-a-thon at the New Jersey Institute of Technology, with the New Jersey Innovation Institute, and in that code-a-thon, we asked coders, students from across the country actually who came to the event, to design solutions that could be used with technology like telehealth, but also uses our Statewide health information exchange network to deliver value to mothers after birth, and that we already had some great innovations come out of that, one used Fitbit technology to alert healthcare providers if a woman's blood pressure or vital signs were abnormal after she was discharged, and one was a crowdsourcing technology that allowed folks to interact with each other, new mothers, and interact with mentors and other folks who know how to recognize important complications. So, again, we're already using that for NurtureNJ and we'll continue to do so.

CP: Despite the security risks, there are still a lot more benefits to this new and growing technology.

CR: Folks are, before picking up the phone and calling or making an appointment with their medical professional, they have several clicks and they're right into websites, webchat sites. In some cases, there's these urgent care and immediate care centers which are just springing up all over. Also, bringing medicine to the public in a quicker and a more effective way.

SE: An important example that has a lot of meaning for me, is its use for veterans with mental health conditions. I was at the VA as a Physician Executive there before being Health Commissioner here in New Jersey, and a major way that we offered access to mental health services to veterans, especially in rural areas, was through telehealth. The frequent need to interact with veterans with PTSD, for example, it cannot be overemphasized. We really have to consult with our veterans frequently, check in with them, even if it's just to say how you're doing, and what telehealth allows for is the ability to do that more frequently without requiring that veteran to drive to a brick-and-mortar facility to do that.

CR: If you look at the advances that medical technology have offered over the past several decades, actually, it's quite amazing, and so, to be without those medical advances would certainly harm us more than it would protect us. We are always at risk of data lost, data intrusion, data breaches, and in particular, when we we're talking about health and lifestyle changes, you really have to weigh the benefits against not having it. Using modern technology, using it effectively and conservatively, and being prudent with your security measures is almost always going to outweigh the risks of a cyber intrusion.

SE: You know, the more we can engage with patients in this technology, the easier things will be for patients but also the better the outcomes. To be able to have seamless access through technology that you already own, technology that's affordable and accessible to all members of our population, is really where we want to go, and in order to do that, we have responsibilities as a health department, as a state, through a groundbreaking initiatives like the First Lady's NurtureNJ, to get access to as many people as possible to this technology, because it really translates into more access to healthcare, and interactions with the healthcare system. So, all of that is a really important, and that's the goal that we're shooting for.

CR: In this position, it's been an opportunity to share and learn and experience information with medical professionals, like Dr. Elnahal, and other state agencies and see how data protection, data privacy is impacting all of them. I would also be quite remiss if I didn't put in a plug for the New Jersey CICC, NJCCIC, that's the New Jersey CICC which is an asset that is so valuable for New Jersey citizens, local, municipal, county employees, as well as private sector. The director of the NJCCIC, Mike Geraghty, runs at a tremendous shop, and has an absolutely service oriented-approach up there. They can be reached at cyber.nj.gov

CP: Telemedicine is where healthcare and the fast-paced world of technology intersect and forever change healthcare, health education, self care, and for some, access to care. mhealth, implantable devices, all of these things come with their own set of issues, but ultimately, these technologies are giving all of us the chance to be our healthiest selves. We now have the capabilities to perform preventive and diagnostic care from the palms of our hands, saving costs, time, and above all else - lives. But we also have the responsibility to stay vigilant with the exchange of information that this requires. That's it for this episode. Don't forget to subscribe to us, as well have new episodes and soundbytes dropping soon. If you have an idea about a topic you like us to cover, please email us at podcast@tech.nj.gov. I'm Craig Parker, and thank you for listening to TechNJ.