Continuing my Cardiology Elective Virtually at NYITCOM during the COVID-19 Pandemic

By

Slava Gitelman, OSM4
NYITCOM
Old Westbury, New York
sgitelma@nyit.edu

ABSTRACT

COVID-19 is a disease caused by a novel coronavirus that has not been previously identified, despite the fact that coronaviruses commonly circulate among humans and lead to mild cold-like symptoms. Coronaviruses are a large family of viruses that infect animals. COVID-19, like MERS-CoV and SARS-CoV, develops in bats and was spread from animals to people. At the time of writing, the COVID-19 pandemic is still spreading globally and the situation is evolving. In the U.S., there are over 1.2 million confirmed cases and over 70,000 confirmed deaths to date. In New York, there are over 319,000 confirmed cases and over 19,000 confirmed deaths. Worldwide, there are over 3.6 million confirmed cases and over 250,000 confirmed deaths to date. This publication details my experience during the COVID-19 pandemic in New York, as I continued my cardiology elective virtually with Dr. Todd Cohen, Chief of Cardiology, Director of Medical Device Innovation, and Director of the Long Island Heart Rhythm Center at my medical school (New York Institute of Technology College of Osteopathic Medicine, Old Westbury, New York).

INTRODUCTION

COVID-19 has forced medical professionals to bravely risk their own health to save others. With hospitals overloaded and elective surgeries cancelled, many patients still need to be seen but cannot travel due to social distancing. At the same time, medical education took a hit. I am a 4th year medical student at NYITCOM in Old Westbury, NY, and I was in the middle of my fourth year cardiology elective with Dr. Todd Cohen during the COVID-19 pandemic outbreak. Dr. Cohen is also an attending electrophysiologist in the Mt. Sinai Health system, and I was observing him at Mt. Sinai Morningside in Manhattan, NY, shortly before NY metropolitan hospitals cancelled all elective procedures. In the middle of March 2020, this pandemic left all third year students and the majority of fourth year students unable

to physically attend any hospital or clinic clerkships. At NYITCOM, 118 fourth year students graduated early as D.O.'s on April 15th to heroically join the healthcare workers already saving lives on the front lines. The rest of the medical students were sent home, in accordance with social distancing, and instructed to complete online medical education modules.

In addition to completing online modules, I chose to continue my clinical cardiology rotation with Dr. Cohen virtually as he moved to telehealth. Initially, I was helping him with clinical and research activities, working on his book and participating in his remote ECG teaching classes. However, through his latest innovation called TeleMedstudent™, I have been able to participate virtually in the clinic, with patient approval of course, and continue my clinical education.

COVID-19 DETAILS

The epicenter of the COVID-19 outbreak was Wuhan, Hubei Province, China. More information can be found on the CDC website at: https://www.cdc.gov/coronavirus/2019-ncov/casesupdates/summary.html#emergence

COVID-19 symptoms appear 2-14 days after exposure to the virus. Symptoms include cough, shortness of breath, fever, chills, headache, sore throat, myalgias, and new loss of taste or smell. Children have similar symptoms to adults, but the course of illness is typically milder. Emergency warning signs include "trouble breathing, persistent pain or pressure in the chest, new confusion or inability to arouse, and bluish lips or face." *Older adults and people with underlying medical conditions like heart disease, lung disease, chronic kidney disease or diabetes seem to be at higher risk for developing more serious complications.* More information can be found on the CDC website at: https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html

We are still learning about how COVID-19 spreads from person-to-person and why illness severity ranges. People who are infected often look and feel sick and are capable of transmitting the virus. However, many individuals remain asymptomatic and may be capable of spreading the disease despite not demonstrating clinical symptoms. It is thought to spread by infected respiratory droplets that are produced when an infected person talks, coughs, or sneezes. These droplets may land in the mucous membranes, such as the nose or mouth, of an individual and then cause disease. Fomite transmission may also be possible via contact with contaminated objects, such as doorknobs or other surfaces. COVID-19 spreads easily and sustainably within people. More information can be found on the CDC website at: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html

Since no effective vaccine is yet available, mitigation recommendations include staying home, social distancing, wearing masks, avoiding face touching, and vigorous hand washing.

TELEHEALTH SOLUTION CREATED BY DR. TODD COHEN FOR VIRTUAL MEDICAL EDUCATION

To address the concerns of many of Dr. Cohen's cardiac patients who are at increased risk due to COVID-19, Dr. Cohen employed a cloud based telehealth solution through his electronic fax system called Updox™. Dr. Cohen described his use of a cloud based electronic health system utilizing a cloud based electronic fax (all HIPAA compliant) in the March 2019 issue of EP Lab Digest, but that description did not have a telehealth component. Dr. Cohen's telehealth solution can be found in his article "The Long Island Heart Rhythm Center: Using Digital Health Innovation to Create a New Paradigm in the EP Office-Based Practice." https://www.eplabdigest.com/long-island-heart-rhythm-center-using-digital-health-innovation-create-new-paradigm-ep-office-based-practice

During this pandemic, I observed Dr. Cohen exploring several telehealth options in order to determine how to best address the emergent needs of his cardiac patients. Ultimately, he chose Updox™ because it made his transition to virtual care and telemedicine easier (since it was already linked to his practice's fax and electronic medical records). Additionally, this system offered the privacy, security and efficiency that Dr. Cohen needed to "pivot on-a-dime" and immediately use telehealth. **Table 1** shows my observations of the benefits and of the drawbacks of telehealth that I witnessed firsthand during my Cardiology rotation with Dr. Cohen. Some of what I witnessed was in part due to the presidential emergency declaration, which allowed clinical care of old and new patients to be unabated during the instruction of novel virtual care.

Although elective invasive cardiology and electrophysiology procedures were cancelled at all the local New York hospitals, many of Dr. Cohen's patients still required follow up and telehealth became their main method of doctor-patient interaction. This rapid transition to telehealth by Dr. Cohen's practice is outlined in an article that I coauthored entitled "Rapid Transition of a Traditional Cardiology/Electrophysiology Clinic to Telehealth in the Setting of an Emergent Pandemic." https://www.eplabdigest.com/rapid-transition-traditional-cardiologyelectrophysiology-clinic-telehealth-setting-emergent-pandemic

Dr. Cohen is able to communicate virtually with his patients using Updox™. However, he came up with a novel system and method for allowing medical students to also participate in his clinic virtually. If the patient consents, I (as his medical student) can virtually observe and participate in Dr. Cohen's telehealth visits by integrating Updox™ with a second HIPAA compliant video chat system. I am

able to observe Dr. Cohen obtain a history from his patients and virtually examine them. This protects cardiology patients from traveling to see a doctor at a time when cardiac patients have some of the highest risk factors for contracting severe COVID-19.Thus, Dr. Cohen and his team developed a novel web-based application that permits medical students (TeleMedstudent™) or physicians-in-training (TeleFellow™) to be remotely involved in virtual visits. I tried out TeleMedstudent™ firsthand and here are my thoughts and reviews.

MY PERSONAL EXPERIENCE WITH VIRTUAL MEDICAL EDUCATION

In addition to completing online modules, I continued my cardiology rotation with Dr. Cohen and witnessed the development of his virtual telehealth system to teach medical students and physicians-in-training. My experience has been overwhelmingly positive, and this system is something that everyone should have access to, even after the world develops herd immunity to COVID-19. If a patient is unable to see a doctor in-person for any reason (sickness, weather, distance, etc.), the doctor will still be able to see and assess the patient virtually.

Dr. Cohen's empathetic and considerate cardiology and electrophysiology practice also specializes in seeing hypermobile Ehlers-Danlos syndrome patients. He is in constant contact with Dr. Bernadette Riley, an incredibly compassionate physician and the Director of NYIT's Ehlers-Danlos Syndrome/Hypermobility Syndrome Center, and together they help manage people who may have debilitating cardiac symptoms. I assist with the clinic and help streamline their workflow by reviewing referral documents, many from Dr. Riley, and by gathering a comprehensive history from the records for Dr. Cohen before any new patient visits. Dr. Cohen's team demonstrates the highest level of compassion for all patients.

During my cardiology rotation, I observe Dr. Cohen's patient interactions and assist with his practice remotely through his virtual telehealth system. During these virtual visits, the patient does not see me or any other medical student for that matter, and could only hear me if Dr. Cohen permits. If I ever speak during the patient encounter, I always introduce myself and try to pass on a positive message. To date, permission for my participation was always granted, except with one person who knew me personally.

During the encounter, I review the patient's history and often write my own SOAP note remotely while Dr. Cohen writes his. This is very educational for me because the more complicated the case, the better I am able to get at managing patients with a wide variety of ailments. This increases my

competence and confidence. After the encounter is complete, Dr. Cohen and I would discuss the case remotely.

I remotely observe Dr. Cohen diagnose postural orthostatic tachycardia syndrome (POTS) in patients with EDS with the help of an Apple watch. I observe assessments for edema and swelling from heart failure. While heart and lung examinations are waived (due to inability to provide virtual auscultation), inspection plays an important role in these telehealth visits. Dr. Cohen is able to assess for skin color, bruising, speech, movement and wound healing. Many of Dr. Cohen's patients have devices, from which we are able to obtain a device transmission in advance, and this provides further insight into the patient's condition. Many patients present with palpitations and pre-syncope. The possibilities for improving the virtual telehealth system are endless, including developing a possible physical exam liaison (TeleStethescope) for auscultating lung and heart sounds. **Table 2** shows solutions for drawbacks that I have observed.

I learned that Dr. Cohen's approach of being conservative before proceeding to more invasive procedures is always in the patients' best interests. We do all we can to help ease these patients' lives and care for them. With Dr. Cohen's virtual telehealth system, I was able to continue my clinical rotation and assist Dr. Cohen in caring for his patients during this unprecedented time. Since I have also completed online modules for medical learning, I created **Table 3** in order to compare the two ways of learning. Most importantly, it was more difficult to learn, visualize and remember clinical facts in the online modules, as opposed to participating in and learning from a virtual patient encounter.

CONCLUSION

COVID-19 is a deadly pandemic that has taken many lives, especially of older individuals and individuals with heart, lung, kidney disease, and diabetes. During and after the pandemic, telehealth will continue to be critical in helping patients safely receive medical care from home if necessary. Dr. Cohen's novel virtual telehealth system will allow medical students, like me, and physicians-in-training to actively participate in and learn from virtual doctor-patient encounters. This has been very helpful to my medical education, and it should be implemented as soon as possible in order to keep medical students and physicians-in-training engaged during a time when in-person interaction is not possible or may be dangerous.

APPENDIX

TABLE 1: Benefits and Drawbacks of Telehealth for the Cardiac Patient during a Pandemic

Benefits	Drawbacks
Minimizes viral exposure to a potentially at risk population.	Cannot fully see and examine the patient and perform new 12-lead ECG.
Many of Dr. Cohen's patients have automated blood pressure monitoring devices at home and have implantable or wearable devices in which ECG recordings and other information (device performance, heart failure monitoring) can be remotely performed.	Not every patient has an automated blood pressure device or implantable/wearable device. Some new patients will need an in-office echocardiogram, especially if they have not had one in the past. Implantable devices such as loop recorders, pacemakers or wearable devices permit an understanding of the patient's heart rhythm and may also be indicated for new patients in office. If a patient needs emergent device placement, this poses difficulty as cardiac patients have some of the highest risk for COVID-19 complications and emergent hospital procedures thus increase risk of illness. It is imperative to monitor patient rhythm for an electrophysiologist.
Many patients can still be examined through history taking, virtual physical examination, and any remote transmissions of implantable/wearable devices.	Heart and lung exams are waived since inexpensive TeleStethoscopes are not readily available.
During bad weather or even illness (such as COVID-19), the patient can be safely seen by Dr. Cohen.	

TABLE 2: Observed Drawbacks during Virtual Medical Education during the Pandemic and Solutions

Possible Drawbacks to Telehealth, TeleMedstudent™	Solutions
Patients cannot receive a complete examination.	Although physical exams are crucial, heart and lung examinations are not critical for all electrophysiology patients, many of whom had recent exams from either Dr. Cohen or their referring physician. Still, this opens a market to be able to swiftly assess patient heart rhythm remotely without the need for emergent hospital procedures in new patients who need monitoring.
Patient privacy	All encounters are HIPAA compliant. Medical student permission was always granted, except one patient who knew me. If a patient does not approve of student involvement, the medical student will not be included in the telehealth visit.
Difficulty with technology for older adults	This has been encountered. Instead of a video call, a phone call was used. I was given permission and was still able to listen to the encounter over the phone via the video chat platform.
Internet connection problems	Connection problems were relatively uncommon. In the case of an internet connection problem, phone communication was used.

TABLE 3: TeleMedstudent™ vs. Online Medical Education Modules for Virtual Medical Education

TeleMedstudent™	Offered Modules to complete requirements

Allows for patient interaction, practice with writing SOAP notes, history taking, case discussion and teaching.	Passively lecturing students on important topics that they must be familiar with in healthcare, but no interaction with live patients.
Allows me to work with a mentor who helps point me in the right direction regarding my clinical education.	Self-study, but no concrete physical patients in order to remember clinical medicine.
Continue clinical practice and clerkship during the Pandemic	Learn facts and important clinical practice information, but not necessarily attached to live clinical scenarios.

In memory of my grandfather Avram Gitelman who passed away from cardiac arrest, COVID19 complications