



Changing Gears: “Emergence of Telemedicine in the Era of Pandemic”

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Coronaviruses (CoVs) belong to subfamily Orthocoronavirinae in the family Coronaviridae. Historically, these viruses have been seen in a variety of mammalian and avian hosts and only cause mild disease except for three key outbreaks, which led to severe disease in immunocompetent hosts. In 2002 and 2003 coronavirus causing severe acute respiratory distress syndrome (SARS-CoV) emerged in China but luckily did not cause much mayhem. Then came the Middle East respiratory syndrome (MERS-CoV) in 2012, originating in Saudi Arabia and once again did not lead to any significant turmoil. Finally, the third strike came in the form of severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), which shook the entire world in December 2019 as it appeared in Wuhan, China. It forced the city of 11 million people in Central China to go under lock-down in January 2020 and affected not only China but also the majority of countries around the globe. United States of America (USA), United Kingdom (UK), Spain and Italy in particular saw the cruelty of this virus. World Health Organization (WHO) declared this “public health emergency of international concern”. Sure enough since then, it has led to public health calamity and economic predicament. The typical picture with SARS-CoV-2 is of pneumonia as demonstrated on chest imaging and the disease is called Coronavirus Disease 2019 (COVID-19). SARS-CoV-2 is an extremely contagious virus and has far exceeded the initial estimates of infection. There has been a lot of debate regarding the transmission of this virus and based on the evidence so far it seems like it is shed through multiple routes. One of the greatest challenges that we are facing at this time is to halt the spread and transmission of this deadly virus as the data does show that it can be spread by asymptomatic contacts [1].

Unfortunately, COVID-19 has spread like bushfire in a very short period of time. Even though the reported mortality rates of SARS-CoV and MERS-CoV are much higher, the fact that SARS-CoV-2 has infected so millions of people globally in such a short period of time is what makes it challenging. This can exhaust the health care system and lead to its collapse in no time. Hence, it can significantly elevate the estimated mortality rate. At the present time there is no officially approved treatment (except for recent positive data on Remdesivir in decreasing the hospital length of stay) or vaccine for this virus and all the data that we have is based on anecdotal and observational studies and multi center experiences. Besides working on an effective treatment regimen it

is strongly recommended to focus on epidemiological methods of prevention and control such as isolating infected patients to reduce human-to-human transmission and controlling the source of infection along with limiting trade of wild animals [2]. Regrettably, this just does not stop here. Experts have hinted towards the second wave of such infection, which could be a consequence of untimely relaxation of various interventions that were put into place to control the spread of infection. If that happens it can utterly crumble the already traumatized health care system and may affect the public and governments globally in countless ways. The challenging part is to figure out which interventions have actually been proven to reduce the transmission. The two foremost interventions that have shown to work are travel restrictions and physical distancing. These were eluded to in one study out of China and showed that there was evidence of new cases as soon as relaxation of such interventions started going into effect [3]. So, it is the need of time to look at geographically focused models of effects of travel restrictions, physical distancing, use of face-masks, temperature checks and contact tracing. These are important considerations as most of the countries are now relaxing such interventions to sustain economic viability [3]. People who are cynical and skeptical of such interventions and restrictions have tried to make a case of herd immunity and how it could be protective. This seems like an erroneous idea. They have compared voluntary infection with SARS-CoV-2 to Chickenpox and have even put forward the idea of “controlled voluntary infection” analogous to the “chickenpox parties” that were seen in the 1980s completely failing to understand that the mortality of COVID-19 is 100 times more. Experts say that for herd immunity for COVID-19 70% of the population will need to be affected. For us here in the United States of America (USA) to reach that threshold at least 200 million Americans will need to be infected. Even if the current trend of daily positive cases and deaths continue it will not be until 2021 that herd immunity is reached. And shockingly by that time over half a million Americans would have died [4-6]. COVID-19 continues to be an evolving and emerging pandemic and the greatest challenge is being faced by the health care industry. First and foremost, all health care providers need to protect themselves and their families during this pandemic and secondly, they still have a moral obligation towards their patients. How can they assess and treat patients while still respecting physical distancing and ensuring that their own health is not jeopardized?

Traditionally, telemedicine (TM) has been an accessible resource for past 60 years, but the most growth has been in the last few years due to advancements in the world of Internet, adoption of technology at various levels amongst the health care providers, hospitals, private practices and the patient population and optimization of restrictions as implemented by several state and federal regulatory authorities particularly in USA. However, it vastly remains under-utilized. It is an enthralling concept that failed widespread acknowledgement particularly in the office-based setting [7].

The COVID-19 global pandemic wreaked havoc on the world's population and unfortunately had a monumental impact on USA. Not surprisingly, with the emergence of the COVID-19 pandemic this aspect of remote health monitoring was brought out of hibernation into the limelight and in the last few weeks there has been an almost ten percent increase in its use in USA. As hospitals started to see an outpour of acutely ill patients and a mammoth surge in their emergency department visits, they realized that the only way to reduce the risk of transmission of this contagion and provide befitting care to the high risk and critically ill patients is to protect the low-risk population, by keeping them out of the hospitals. This is where TM can play an integral role by triaging and treating patients who are not seriously ill in the outpatient setting and trying to keep them out of the hospitals thus reducing the burden on an already encumbered health care system. Soon after the start of this pandemic Chinese authorities advised the patients to seek help online instead of rushing to the physicians' offices or the hospitals. And, the major drive behind this action was the national health insurance's agreement to pay for these virtual visits as the hospitals and clinics were at full capacity. USA, Canada, UK and many other countries followed suit. Various professional associations and regulatory authorities in USA became more conscious of the role of TM in these overwhelming and devastating times and came up with an organizational framework and guidelines especially in terms of remote health monitoring to help the healthcare providers achieve this goal. Medicare, Health Insurance Portability and Accountability Act (HIPAA) and many other commercial health plans relaxed restrictions and revised the reimbursement rates making it structurally and financially feasible for the providers to utilize and adopt this technology for the greater benefit of their patients and respective communities. With the appropriate implementation of TM uninterrupted care can be provided not only to people suspected of having COVID-19 infection but also to millions with chronic conditions. It can minimize the risk of exposure to both patients particularly; those who are at high risk and health care workers alike by staying at home and flattening the curve. Additionally, it can overcome several barriers from the patient's perspective namely scheduling office visits at a time when the physicians and their staff are inundated, transportation and mobility issues and shortage of local doctors. Hence, it would not be unjust to say that TM seems to be a paradisiacal solution when it comes to avoiding long wait times at the physicians' office, getting expansive access to

healthcare delivery options, minimizing the risk of exposure both for the patients and the health care providers and decreasing the overall healthcare cost and burden [8,9].

However, like any other solution TM has its own share of challenges and nuances, which are not that uncomplicated to understand. TM is expedient and cost effective in numerous ways but it cannot replace the physical examination performed by the human touch. In order to better fathom the complexity associated with the lack of its widespread acceptability one has to recognize that both patients and providers have their biases and circumscriptions. The four paramount reasons from the patients' perspective seem to be the cultural bias based on how health care has been catered in the past, lack of ease due to not being face to face with the provider in person, not being tech-savvy especially when it comes to the older population and, not knowing if these services will be covered by their health insurance. The physicians on the other hand can find this concept unsettling due to the program cost, reimbursement and the resistance among fellow health care personnel due to their own inherent biases [8].

We have faced four major outbreaks in the last decade including the MERS, Ebola virus, Zika virus and COVID-19. And, we do not know what the future holds so it might be high time to reconnoiter TM as a front line health care delivery option for all the aforementioned reasons. There are various legal and regulatory road blocks that remain into play along with reimbursement dilemmas from a provider's perspective so telemedicine might turn out to be a bubble that may lose its market value and monetary worth once things normalize. But, if the state and federal regulatory authorities and national organizations continue to work along side with the commercial payers to ensure that the requirements as imposed by various state, federal and other regulatory authorities are acceptable and there is a modest increase in remuneration innumerable practices, hospitals and providers across the country may furnish care via TM and help prevent this promising technology from going back into oblivion. Only time will tell but till then, it is prudent to keep the guards up, follow all necessary hygienic procedures and practice physical distancing.

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