



Perspective on Primary Care Approach to Covid-19

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Perspective

In late December 2019, an outbreak of SARS-CoV-2 (COVID-19) began in the city of Wuhan, China. Following widespread of epidemic in numerous countries, the World Health Organization along with the US Centers for Disease Control and Prevention announced a COVID-19 pandemic and provided information to healthcare systems preparedness [1]. Although the flow of information is overwhelming and various health care facilities such as hospitals are actively engaging in various preparedness strategies during this time, the goal of this short communication is to offer Primary care Clinics (PC) or medical offices with some guidelines/recommendations regarding how to prepare to meet COVID-19 challenges. These recommendations are based on the authors analysis of the importance of accurate and consistent communications during this pandemic which is meritorious to be shared among national and international colleagues engaging in similar work. This is especially necessary in understanding the complexity of implementing preparedness strategies needed for PCs during this pandemic. These recommendations are not grounded in research findings and therefore can serve as clinical information from which further studies can be launched.

Coronaviruses are medium sized enveloped, non-segmented, positive-sense single stranded RNA viruses that are crown-like in appearance [2]. In 2003, the emergence of Severe Acute Respiratory Syndrome (SARS-1) caused severe illness and became a devastating epidemic to the developed world [3]. The origin of SARS-1 was found to be from animal reservoirs such as bats that resulted in severe respiratory illnesses in humans and specific strands (HCoV-HKU1 and HCoV-NL63) were identified [4]. In 2012, another novel coronavirus, MERS-CoV was identified in the Middle East which also caused severe illness [5]. Furthermore, in December 2019, a novel coronavirus strand, known as COVID-19 originated from Wuhan, China and is the cause of the current global pandemic [6].

When encountering suspected COVID-19 the priority is a clinical assessment which includes current symptoms, history of travel, contact tracing, current medications and comorbid conditions especially in the elderly [7]. Respiratory tract system is the main involvement; however, the pathogenesis extends to other organs such as heart, kidney, brain, vascular and integumentary system. The symptoms are varied ranging from fever, dry cough, rhinitis, sore throat and shortness of breath, but some patients are asymptomatic. However, the most common reported symptom is fever which is observed in more than 90% of patients [8]. The PCs are also advised to assess epidemiologic factors which are recommended by the CDC's travel advisory [9]. Elderly patients, especially older than 70 with chronic medical conditions such as lung disease, heart disease, liver disease cancer, autoimmune condition, or immunosuppression, are at much higher risk for developing severe disease and higher mortality [10]. A higher index of suspicion should be raised with those with symptoms that are coming from endemic countries. These categories of patients must be prioritized for rapid diagnostic testing. In addition, chest X-ray, CT scans with unique imaging features along with laboratory tests can further guide PC professionals in the diagnosis of COVID-19 (Table 1).

To date, there are more than 70 experimental therapies undergoing in several countries. The current status of potential targeted and effective therapies for COVID-19 remain uncertain although in the United States Remdesivir has generated some support as an IV agent in diminishing the time to recover from 15 to 11 days. Vaccine developments are vigorously underway at least by a dozen countries. However, given the mutated nature of the virus, the authors caution the use of such vaccines at this time. Finding a regimen is complex as evident by the failure of the use of HIV protease inhibitors lopinavir/ritonavir among patients admitted with severe COVID-19 [13]. In addition, the use Hydroxychloroquine against COVID-19 has generated less enthusiasm internationally [14]. The use of the latter treatment has been investigated for COVID-19 patients in China and has generated interest for use in certain international community's [15]. The US-FDA is allowing the use of Hydroxychloroquine by healthcare centers that have generated an approved FDA protocol. Hydroxychloroquine has a favourable pharmacokinetic profile, following a single

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Table 1: Diagnostic features of COVID-19.

Diagnostic Work Up	Feature	Reference
Chest X-Ray	Usually peripheral focal or multifocal ground-glass opacities affecting both lungs in approximately 50% to 75% of patients. In some patients, especially in younger age, may not be consistent with disease severity. Serologic testing or RT-PCR are warranted.	[11]
	Keep in mind a negative CXR does not rule out COVID-19.	
	Usually peripheral focal or multifocal ground-glass opacities affecting both lungs in approximately 50% to 75% of patients. The severity of disease in some cases may not be parallel with CT imaging (consider age and comorbid conditions). As the disease progresses, crazy paving and consolidation become the dominant CT findings, peaking around 9 to 13 days followed by slow clearing at approximately 1 month and beyond. In some patients, especially in younger age, may not be consistent with disease severity. Serologic testing or RT-PCR are warranted.	
CT scan	Keep in mind a negative CT does not rule out COVID-19.	[11]
	Lymphopenia (poor recover) Elevated Monocytes, Neutrophils, liver enzymes and creatinine. d-dimer: Elevation may be particularly predictive of respiratory failure	
Labs	Elevated cardiac biomarkers.	[12]
	Procalcitonin: Most patients at presentation have normal level.	
	Elevated CRP, ESR, and LDH	
	Decreased serum albumin and Hemoglobin	

200 mg oral dose of Hydroxychloroquine to healthy individuals, the mean peak blood concentration of hydroxychloroquine was 129.6 ng/mL, reached in 3.26 h with a half-life of 537 h (22.4 days) [16]. Since dose of 200 mg may not produce an immediate acute adverse effect, we suggest its use as a prophylactic agent for health care workers who are in the frontlines. A single dose of 200 mg to 400 mg can also be used for at risk individuals. However, we strongly recommend baseline labs and EKG prior to prophylactic use.

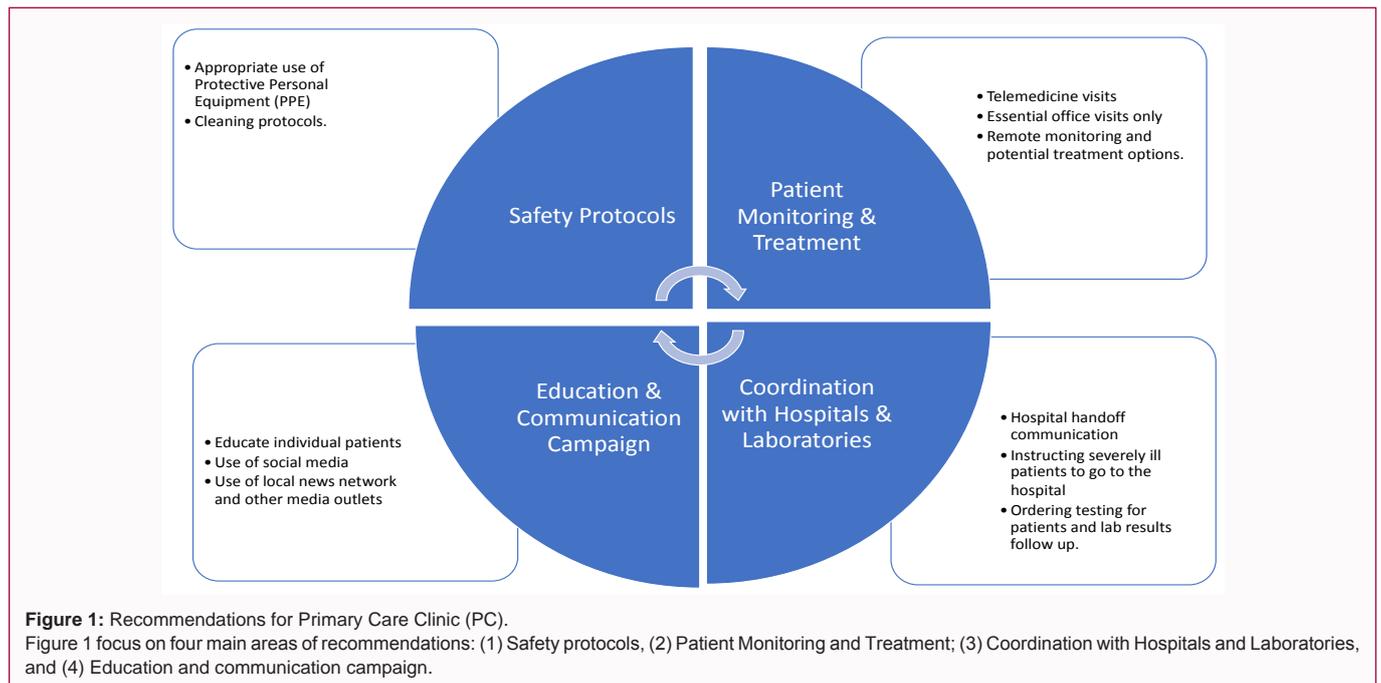
The prescription of hydroxychloroquine must also be explored in the PC setting granted drug monitoring on weekly basis takes place. We caution about contraindication of this medication such as cardiotoxicity (prolonged QT syndrome) and prolonged use in patients with hepatic or renal dysfunction and immunosuppression. However, in the absence of effective vaccine and directly acting antiviral agents, the primary care doctors can contribute to the safe prescription of this drug [16]. The use of a humanized interleukin-6 (IL-6) receptor antagonist, Tocilizumab, which first approved by the U.S. FDA in 2010 for rheumatoid arthritis, can now be used to manage severe COVID-19 infections with the presentation of Acute Respiratory Distress Syndrome (ARDS) which has been tested in China [17]. The manufacturer of Tocilizumab has recently launched a phase three clinical trial study evaluating the efficacy of this drug plus standard of care for use in hospitalized adult patients with severe COVID-19 pneumonia [18]. We suggest the current rational use of Tocilizumab and other IL-6 antagonists may be considered in those patients with severe form of disease when they develop severe Cytokine Release Syndrome (CRS), also known as a “cytokine storm”. CRS essentially involves an overreaction of the immune system to COVID-19 which triggers a runaway inflammation response. CRS can lead to organ failure and death [19]. We strongly recommend the testing of inflammatory markers prior to administering this medication.

Healthcare clinics located in communities are an important part in creating infrastructure to address epidemics both immediately and long term [20]. It was stated that health clinics may serve as a critical role during an epidemic were trained healthcare professionals can deliver vaccinations and help monitor disease patterns in patients.

It is already proposed that the use of telemedicine during the COVID-19 pandemic can be instrumental in monitoring and triaging patients safely [21]. We believe that during this pandemic, PCs are well positioned to support to effectively treat and coordinate care for patients that will reduce over utilization of hospital services and address unnecessary worry and anxiety among individuals in their respective communities. Figure 1 outline the specific strategies being recommended by us for PC during this pandemic. We predict that if PCs adopt our recommendations, they may contribute significantly in flattening the coronavirus curve and avoid overwhelming our healthcare systems around the country.

Safety Protocol: First, in order to effectively perform this role, PCs need to establish clear coronavirus policies for their staff and clinicians within the office in order to protect the providers from getting infected. These policies are required to be followed in detail and comply by all staff members. For instance, the CDC has published recommendations for all healthcare personnel to use proper Protective Personnel Equipment (PPE) when dealing with potentially infected patients [22]. Although the recommendations included PCs, there is very few studies looking at the effectiveness of these measures and if the PCs that are located in communities around the country are actually adopting such measures. For instance, we suggest that the PCs establish in office cleaning protocols that include cleaning office desk spaces, door handles, exam rooms, blood pressure cuffs, and other equipment after each patient use to eliminate any potential fomites in the office.

Patient Monitoring and Treatment: The use of remote care is encouraged during this pandemic using telemedicine or phone consultations with patients to reduce the number of in office visits by patients. This type of remote care was already recognized as a convenient and inexpensive way to care for patients who are potentially infected with the COVID-19 virus [21]. Minor medical conditions (i.e. diabetes, hypertension, etc.) should be treated remotely with prescriptions being sent to pharmacies electronically. Essentially, PC in the community will need to stay open and staffed accordingly and restrict office visits to uncontrolled chronic



diseases and acute illnesses that cannot be managed at home. Once treatment or vaccination for the COVID-19 is made available for use with established guidelines, PC can serve an important role in increasing access to such treatments. For instance, antiretrovirals or even Hydroxychloroquine can be prescribed by PCs in collaboration with infectious disease doctors, which would ultimately make these interventions more widely accessible.

Coordination with Hospitals and Laboratories: PCs should inform local hospitals of their capacities and capabilities in order to coordinate on redirecting minor cases to the PCs. In addition, hospital physicians can also look at the possibility of discharging patients sooner from the hospital setting with appropriate hand-off communication to local primary care doctors in order to reduce readmission to the hospital. This will in effect make more hospital beds available for patients who are severely ill with the COVID-19. This is especially important during this pandemic since there are limited hospital resources for the predicted number of severely ill COVID-19 patients [23]. PC also plays a pivotal role in presumed diagnosis and to establish baselines using physical exam, labs, and imaging to determine if the patient warrants hospitalization. For instance, this level of coordination with specific patients in the community who are experiencing symptoms of potential COVID-19 infection would enable effective monitoring of signs or symptoms of severe illness. PC's need to also coordinate with the Department of Health (DOH) and commercial laboratories for testing and to support ongoing surveillance of this pandemic. During testing shortages, the only patients that should be tested are patients with severe illness that are hospitalized in order to support hospital-based clinician's diagnosis and management. Moreover, PCs can advise all patients with symptoms to stay home and monitor those patient's closely using telemedicine, phone consultation, and other remote means as per above. Once testing is made widely available, then PC can send appropriate patient who meet criteria to "drive thru testing" centers. Also once point of care testing is made available, PCs can send actual test kits to patient's homes that will be deposited to laboratories that would in turn send the results directly to the treating primary care

doctor(s).

Educate and Communication Campaign: Lastly, PCs should institute an education and communication campaign for ongoing dissemination of information about the coronavirus to patients and their respective communities. For instance, doctors can choose to educate patients at the end of each encounter about the pandemic and how best to practice personal hygiene. The CDC has already recognized the pandemic's ability to create stress and anxiety among individuals and have already recommended how best to reduce stress and improve coping skills [24]. We believe that PCs are instrumental in helping to reduce stress and anxiety among patients and members of their respective communities through reassurance of individual patients and by providing sound and reliable advice to people in the community. PCs can also use social media as a platform to efficiently reach out to more people in their communities. This has been recognized as an effective tool for disseminating information during this coronavirus pandemic [25]. PCs on social media we believe can be instrumental to counteract the misinformation and deliberate rumors that usually spread through social media platforms. PCs can also choose other media outlets located in their communities such as radio stations, newspapers and local TV stations to effectively communicate reliably and trusted information about COVID-19.

In conclusion, as the pandemic continues to spread, the role of PCs is ever more important. If PCs around the country were to adopt a comprehensive and effective safety protocol for their office, have a patient monitoring & treatment system, effectively coordinate with hospitals and laboratories and participate in education and communication campaigns, people living in their respective community would have access to the quality of care they need during this pandemic. In addition, if they were to adopt these four recommendations, we would have a better chance to ultimately reduce the curve during the COVID-19 pandemic.

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