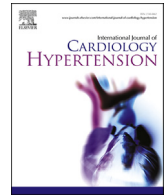




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Hypertension Highlights

Telemedicine can revolutionize the treatment of chronic disease

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The traditional provider office visit for evaluation and management of chronic diseases has been the hallmark of medical care for well over a century. House calls, with all of their advantages, are now a revered relic of bygone days, making only a token resurgence in certain areas such as geriatric and family medicine. In most areas, house calls are economically infeasible, given the pressures to move patients through the outpatient offices quickly and efficiently. In this system, a busy practitioner rushes from room to room for 15 min encounters that often fail to address the needs of the patient. While this formula may maximize revenue, it has failed woefully in a much more important statistic: health outcomes.

The COVID-19 pandemic has forced many providers to move quickly to Telemedicine, including visits by phone and video, thus avoiding disruption in patient care. With this abrupt necessity came the opportunity to address many of the weaknesses of the classic office visit – most notably the reality that many patients' chronic diseases are not well controlled and that only 50% of patients with chronic medical conditions actually take their medications as prescribed [1]. Less than 50% of those with hypertension are at BP goal and medicine non-adherence costs our health care system over \$100 billion annually. Even incredibly evidenced based therapies like statin therapy has only a 50% adherence in patients with known cardiovascular disease, as well as a dismal 20% premature discontinuation rate of clopidogrel in patients six months after coronary stenting [1–3].

The reasons for non-adherence and poor outcomes are many including poor health care literacy, lack of involvement in the decision making process, and confusion on patients and providers part on what medications a patient might actually be taking, particularly after a hospital stay. An estimated 100 million Americans have poor healthcare literacy, putting them at considerably higher risk for hospitalization and poor clinical outcomes [4,5]. Although telehealth can never fully replace

the in-person office visit, it is encouraging to note that meta analyses have shown that telehealth was at least equivalent to in-person visits for numerous chronic conditions [5,6].

Telehealth provides several advantages to combat the major pitfalls of the office visit that lead to medication non-adherence and poor outcomes. Medication reconciliation can be done over the phone or on video with medication bottles or pill dispenser at hand. It is easier for family members to be present and participate in these visits (even from another location) and hear what is said, thereby increasing health literacy for the entire family. With the ability to have frequent visits, patient educations can be focused and frequently reinforced, both with the patient and family members, encouraging dialogue and promoting positive lifestyle changes. Much of the paternalism of sitting quietly in an office and being told what to do by the physician is eliminated. Rather, the patients are comfortable in their own home, allowing for more casual conversation and the patient to feel more involved in the decision making process and take more self ownership of their health. An easy example of this is home blood pressure monitoring, the gold standard of accurate blood pressure readings. Frequent telehealth visits will allow the provider to encourage (and even watch) the patient perform home blood pressure checks. Given the high prevalence of white coat and masked hypertension (where home blood pressure is higher than in-office) in our society [7], the potential health benefits are huge.

Indeed, hypertension is a chronic disease that stands to benefit enormously from frequent telehealth visits. Studies have shown self-monitoring improves both BP measurements and medication adherence [8,9]. And when coupled with telemonitoring, patients who take their own blood pressure at home have shown statistically significant improvement in their hypertension [10]. Unsurprisingly, the patients who are most successful at lowering their blood pressure through home BP monitoring are not those

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who simply self monitor, but those who also have frequent co-interventions. Tucker et al. recently showed in a systemic review that those patients who routinely interact with physicians and pharmacists for medication titration and who receive regular education and life style counseling achieve statistically-significant BP reduction at one year with the use of home BP monitoring [11]. One can easily see how the routine use of telemedicine visits in conjunction with regular home self-monitoring could drastically improve hypertension outcomes.

Another advantage of telehealth that cannot be overstated is improved access to care. The appropriate management of chronic conditions such as hypertension, hyperlipidemia, heart failure, stable angina, and diabetes is enhanced by frequent interaction with the medical system. The ease of obtaining telemedicine visits substantially improves accessibility to providers by breaking down the barriers that time, transportation, weather, and mobility issues can present to a patient. Particularly in vulnerable/low socioeconomic patient populations, research has shown that more frequent contact via telephone may improve outcomes [12]. Many fewer patients will be lost to follow up given the easy accessibility of a telehealth visit. For nursing home patients, a telemedicine visit allows the facility nurse to be present during the visit, often providing useful information related health care issues as well as more accurate medication reconciliation.

While the most vulnerable in our society stand to benefit the most from telehealth, America's already oversaturated healthcare infrastructure and our society as a whole will benefit. Telemedicine visits decrease the need for costly real estate and ancillary staff and by not having the barrier of "rooming" a patient, the visit can start and end right on time, even permitting more patients to be seen in a day. Opening up new appointment slots will allow closer follow-up, and office appointments can be made at times convenient for patients – making it easier for providers to have evening and weekend hours in lieu of times during the day when many people with job or child care responsibilities might find it most difficult to attend. Initially, institutions may balk at this model given the lower reimbursement rates. However, the long-term infrastructure savings in areas such as renting office space will likely eliminate these losses in the long run, and will ultimately benefit both individual institutions and a society that spends nearly 20% of its GDP on healthcare. And as many chronic diseases such as hypertension and coronary disease have environmental associations, the decrease in fossil fuel usage, even if it is just a gallon of gasoline needed for transportation with each office visit, can result in a substantial environmental impact if even a small proportion of outpatient visits can be switched to telemedicine. Additionally, money not spent on gasoline stays in the local economy, yielding other benefits as well.

Telemedicine does indeed have its shortfalls, and cannot replace the in-person visit in all cases. The physical exam is key in a substantial proportion of medical evaluations, and one cannot discount the time-honored emotional benefits of a traditional provider-patient interaction. There will have to be additional reliance on home blood drawing and remote testing such as imaging studies. One has to rely to a large degree on whether a patient feels a telemedicine visit is sufficient for their needs, but they may in fact be the best judge of that. Telemedicine is not intended to replace the office visit, but rather to be an adjunct to it.

We are all seeking some return to normalcy as the COVID-19 pandemic continues and many institutions have viewed a return to the days of a full slate of patients in the office to be comforting indicator of that, and the idiosyncrasies of some payment models even support that

model. But if that is our goal, we have learned nothing from this pandemic in how a new way of seeing patients at their home can be the key to improving our dismal rates of success in treating so many – but not all – chronic diseases. When patients have their chronic diseases poorly treated, they are more susceptible to threats such as COVID-19 and have also done less well with other disease and surgery as well. We need to take this opportunity to bring the house call back, though electronically this time, so that we can learn more about a patient in a way that we can support their needs and identify barriers to treatment. We need to make it easy for patients to see us with a frequency that will ensure their success in having their chronic diseases managed to proper standards and to then enjoy the benefits associated with ideal blood pressure, lipids, heart failure management, coronary disease and angina management, smoking cessation, depression, and diabetes management to name a few. A lesson that must not be lost in this COVID-19 pandemic is the importance of managing chronic diseases and that telemedicine, learned by necessity during the pandemic, may be the key in achieving that.

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Declaration of competing interest

The authors declare that they have no conflicts of interest.

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