MEDICAL PODCASTS IN ENGLISH FOR NON-NATIVE SPEAKERS

Telemonitoring.

Introduction

Hello and welcome back to this IFMiL series of medical podcasts in English for non-native speakers. My name is Alice Byram, and I am a Family and Emergency Medicine Physician. Today we will be looking at telemonitoring. You can find all references and links in the show notes.

What is it?

Telemonitoring has been defined as "the distance monitoring of components of a patient's health as part of a larger chronic care model" as recently as 2016 (1). It is clear, however, that real-time telemonitoring is now opening up the possibility to manage acute illness too.

Types of devices.

Many telemonitoring devices are available. From weight to oxygen saturation, to heart rate and rhythm, it is important to choose the parameters which will affect your management. In an acute setting, this may be the parameters of a NEWS or early warning score such as blood pressure, oxygen saturation and heart rate among others. For more chronic patients, it may be recording weight variations a way of evaluating fluid balance.

Patients own

A recent article in the BMJ noted that "it may be possible to get the patient to take readings from instruments they have at home—for example, temperature, pulse, blood pressure, blood glucose, peak expiratory flow rate, and oxygen saturation"(2). Many patients also have wearables, such as Fitbits and Apple watches. These wearables can measure biomarkers such as heart rate and, in the case of the apple watch, heart rhythm. Although the FDA approval for heart rhythm came out to great fanfare, there was also a backlash from cardiologists against the identification of asymptomatic atrial fibrillation for example. And the worried well using and wanting consultations about the information from their home monitoring can be a challenge in a stretched health care system.

Official

Some home monitoring has been FDA approved for information transfer and sharing with health care professionals. CGMs or continuous glucose monitoring is increasingly available to people with diabetes, enabling them to alter carbohydrate intake, lifestyle and medications in real-time. Not having CGM has been likened to a block of cheese with holes. Even if you do eight pinprick blood glucose checks a day, you will still have only a very limited picture as to what is going on. CGM not only provides a continuous blood glucose measurement, but it also gives tendencies. Knowing you have a BM of 100 stable or 100 going down fast will lead to very different decisions as to how much insulin to inject. Commercial CGM sensors all have FDA approval.

#wearenotwaiting

Sometimes the FDA approved technology is not enough. This is the case in people with type 1 diabetes who can have significant and dangerously low blood sugar levels, especially at night. The need to be able to share this information with other family members who can act if the person with diabetes does not react in time led to the #wearenotwaiting and nightscout movement. Using opensource technology, people with diabetes can upload their CGM readings to the cloud. They can set up alerts and share their blood glucose in a way which was not initially offered by the manufacturers and is still not available for all the CGMs on the market. As this is opensource, it does require a level of commitment that is not needed with out of the box commercial solutions. There is also a disclaimer that the movement is not liable for any safety issues. However, users say it is safe, much more so than the commercial solutions for enabling parents to keep an eye on their children at a distance and for adults to live independently alone.

Pros

Like any technology or therapeutic intervention, there are pros and cons. Advantages include the fact that patients using telemonitoring can be in their own home. This is especially relevant when hospitals are at capacity. Cost is generally, but not always, agreed to be decreased with telemonitoring. The devices themselves have an initial and maintenance cost which has to be absorbed. Depending on the value placed on health care professional time, telemonitoring may be more or less cost-effective. In the case of less expensive monitoring such as BP measurement for hypertension management, telemonitoring and self-monitoring are more cost-effective than clinic care(3). Telemonitoring information can easily be shared across several professionals enabling real multidisciplinary decisions. Another advantage is that patients are empowered by having real-time information and acting reactively or proactively. They can work with their HCP on medication but also lifestyle changes. Studies have shown that telemonitoring of patients with diabetes leads to better blood glucose control, a positive impact on

comorbidities and better treatment and hygiene-dietary adherence(4). Elderly or frail patients in whom transfer to a health care centre can be challenging can particularly benefit from telemonitoring. A Swedish team showed that in elderly patients with advanced HF and COPD, telemonitoring decreased the need for hospitalisation without increasing the overall health costs(5).

Cons

However, telemonitoring does have some negatives. The transfer of monitoring to a home context has been shown to place a high burden on patients. The patient has to be able to carry out these measurements correctly. There is also evidence, perhaps surprisingly, of an increase in clinician and nurse workloads as telemonitoring services expanded(1). Another consideration is the inability to calibrate home apparatus. Several authors recommend specifying in the medical notes if the values reported by the patient are not consistent with the HCP's wider assessment(2). Hacking and security breaches can also happen. The consequences can be lethal, especially if that information is used to change treatment without human input, as in the case of insulin pumps.

Case Studies

Heart failure.

Heart failure is one of the pathologies which has had the most interest when it comes to home monitoring(6). Telemonitoring has existed for a long time in this domain, as far back as 1966 in the form of phone calls(7). Now it includes smart scales and BP monitoring which is transferred directly via the patient's smartphone. There seems to be a reduction in all-cause mortality and HF-related hospitalisations, especially in the case of recently discharged patients(6). A Cochrane review and a more recent Basque review also noted that participants in the heart failure studies reported improvements in quality of life and self-care behaviours(8)(9).

COVID-19

Doctivi

The COVID-19 pandemic has accelerated the adaptation of telemedicine but also that of telemonitoring as a way of keeping patients out of hospitals which are already at capacity. In Barcelona, a recently implemented telemonitoring project for chronic patients, Doctivi, was quickly adapted to include stable COVID-19 patients under the Hospital del Mar. Integrated technology provided by the hospital means that parameters such as blood pressure, oxygen saturation, heart

rate and even steps can be monitored at a distance. Alerts are set up if out of range values are picked up. As this technology includes video calls, this can lead to a medical consultation and review of the management plan.

Conclusion.

Telemonitoring is already with us, and costs will continue to come down. Patients themselves can sometimes be ahead of the health care professionals, and in these cases, you can learn a lot from your patients about the digital health solutions available. Every patient and pathology will need different parameters to be monitored. The ability to filter the parameters of interest and get rid of the excess information noise in order will be paramount. This is where the practice of the health care professional will be augmented, and the patient empowered. If you would like to find out more about telemonitoring you can take the online telemonitoring course in Spanish by Dr Frederic Llordachs at the IFMiL where you found this podcast.

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Questions

1. Review the telemonitoring devices you have available to you in your practice and see if there are any you could add.

2. Speak to 3 patients about the devices they use, formally or informally, and see if they are using them correctly.

3. Look at your own health monitoring apps or devices. Is there one you could use more efficiently for your own health? Make yourself accountable by sharing this information with a friend or colleague. Or just write a paragraph in English to yourself which includes your objectives and ways you will use telemonitoring to help your own health.

4. Two weeks later ask yourself and your patients which aspects and which don't.