



Editorial

Tele-Medicine: The Search of the Holy Grail



“You see, he was going for the Holy Grail. The boys all took a flier at the Holy Grail now and then. It was a several years’ cruise. They always put in the long absence snooping around, in the most conscientious way, though none of them had any idea where the Holy Grail really was, and I don’t think any of them actually expected to find it, or would have known what to do with it if he had run across it.”

– Mark Twain, *A Connecticut Yankee in King Arthur’s Court*

In high income countries in 2030, the life expectancy at birth probably will overcome 80 in males and 90 years in females.¹ As a consequence, the incidence of chronic diseases and of “chronically critical” illnesses will increase. This perspective, with high (often unrealistic) expectations of citizens of those countries, will result in growing burden for healthcare systems which governments will be unable to afford as in the past. For a darker landscape, the COVID-19 pandemic has induced delay in hospital management of “common” respiratory diseases, and in problems in the out-patient clinic performance.^{2,3} As a consequence new models of care have been looked for, to increase the cost/benefit ratios. One of these models is tele-medicine, one of the latest fashions in healthcare organisations.

Although tele-medicine was already an issue of interest before the pandemic, COVID-19 has pushed the search of solution of logistic and organisational issues and the use of available technologies to develop this increasingly important tool.⁴ Indeed, if on Pubmed you look for only the term “Tele-medicine” you can find more than half hundred thousands results (54,428 at January, the 25th, 2023) with an exponential increase starting in the second decade of this century and an explosion in the pandemic era.⁵

Tele-medicine has been defined as ‘Distribution of health services in conditions where distance is a critical factor, by health care providers that use information and communication technologies (ICT) to exchange information useful for diagnosis where doctor is able to perform diagnosis at distance’.⁶ Increasing application of ICT to healthcare and advances in technology of wearable sensors and data transmission have pushed tele-medicine programmes hopefully useful in delivery of care as well as in promoting better compliance to therapies.⁷ In recent years, other terms have been proposed, such as “tele-monitoring”, “tele-communication”, “tele-consultation”, “tele-rehabilitation”, “tele-care” and others to somehow define different activities at distance.

This modality has been reported as effective, safe, cost efficient, and well tolerated in management of several respiratory diseases such as chronic obstructive pulmonary disease, asthma, interstitial lung diseases, in home mechanical ventilation and reha-

bilitation programmes and in other clinical conditions including COVID-19 pandemic. However the evidence is not undisputed.^{8–12} Tele-consultation programmes provide consultation from remote distance when a respiratory assessment or support is already in place.¹³ Indeed, the most relevant advantages are easier access to specialist, better comfort especially for disabled, reduced infection risks, and travelling expenses.

However, there is the other side of the coin. Legal, organisational and technical issues still need to be defined:

- Tele-medicine should guarantee data security, privacy and confidentiality with economic compatibility. It must be considered as a medical act with related legal risks and problems (for instance, who would be responsible for any damage due to malfunctioning of a monitoring system of a home ventilatory assisted individual?: The prescriber? The operating company? Who other?). With the increasing diffusion of this technology, legal cases will increase and clarity on distribution of responsibilities is required. Unfortunately, at present many governments have not provided yet any dedicated regulation or legislation.¹⁴
- There are still many barriers such as education, demographics (e.g. older individuals, cognitive, motor, visual, phonation and speech abilities), lower socio-economic conditions, lack of access or confidence with technology, lack of high speed internet connection, costs.¹⁵
- Dedicated locations, devices and softwares are required. In addition we need new professionals as “digital assistants” to serve as interface with the medical professionals to help and deal with the new knowledge and technology.
- Respiratory questionnaires usually used in clinical practice to check disease status and quality of life, as well as adherence to therapy or use of devices, must be available in the tele-consultation environment.^{16,17}
- Sensors used with miniaturised processors, body area networks, and wireless data transmission technologies allowing the assessment of physical, and physiological parameters have to be easily accessible via software connection in dedicated computers.⁷
- Other important challenges will be to develop appropriate algorithms (including Artificial Intelligence) and protocols to ensure that tele-monitoring data are used to really improve clinical outcomes.¹⁸
- Finally, we need more research in the field, taking into account that the superiority on “usual care” (if any) of this strategy must be assessed within the different healthcare systems of different countries. For instance a tele-medicine programme is probable

to be shown as more effective when compared with a low than with a high level healthcare system.

Tele-medicine for individuals with chronic respiratory diseases has greatly improved in recent decades, thus allowing better care, safety, and greater satisfaction of cared people and caregivers. In fact, portable home spirometers, pulse oximeters activity trackers and cough monitors have emerged and have been used for recent years and can be of value for real life care and clinical trials.^{19–22} It is also important to acknowledge that these technologies should foster patient empowerment to facilitate self-management. Accordingly, there has been patient-guided research on optimisation of tele-monitoring using platforms and online storage clouds like the “patients like me” project.²³

In conclusion tele-medicine is just one of the steps of the increasing intrusion of technology in the care.⁴ As caregivers, we must keep in mind the balance between the advances of technology and the maintenance of empathy and a real approach to our most severely affected patients. Despite hope and trust in this tool, we need much more evidence before this modality can be considered as a recognised reality in the management of respiratory diseases. This tool should not be considered either as a panacea or a save money box only, but simply another little step in the never-ending story of medicine.

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