

Mirage of Emerging Medical Technologies for Remote Diagnosis and Monitoring

Sorana D. BOLBOACĂ*

Department of Medical Informatics and Biostatistics, Iuliu Hațieganu University of Medicine and Pharmacy, Louis Pasteur Str., No. 6, 400349 Cluj-Napoca, Romania
E-mail: sbolboaca@umcluj.ro

* Author to whom correspondence should be addressed

Abstract

Remote diagnosis and monitoring, collection, transmission, evaluation, and communication of health data from electronic devices, is a subset of telehealth, the healthcare activities conducted through telecommunications technologies. Remote patient monitoring (RPM) devices are noninvasive devices such as Fitbits, wearable heart monitors, Bluetooth-enabled scales, glucose monitors, skin patches, shoes, belts, or maternity care trackers that enable subjects to share healthcare data from the convenience and comfort of home. The RPM devices can share real-time data allowing timely recommendations, and the market is booming with new devices. The 2019 novel coronavirus (COVID-19) pandemic induces an unprecedented health worldwide crisis imposing an acceleration of innovative emerging technology solutions to support diagnosis and monitoring. Evans et al. [1] used remote robotic ultrasound equipment (MGIUS-R3 system) to examine the lung of COVID-19 positive patients by ultrasonography (lung ultrasound examination, LUS), a diagnosis method less sensitive than computer tomography (CT) but without the irradiation risks. Even though patient-to-patient or patient-to-healthcare staff transmission is inexistent, MGIUS-R3 system needs appropriate evaluation to support the daily care practice. Kosmos is a handheld easy to care and clean US device that can be used at the point-of-care, bringing the US examination to the patient. Other solutions that incorporate AI (artificial intelligence) algorithms to reduce the inter-examiner variability are also proposed. Virtual visit technical solutions also emerge with COVID-19, and are support by a legal frame. Several such systems are presented with their features and disadvantages. Drone with a thermal camera has been proposed for detection of subjects with high temperature [2] or was used as a carrier (for medication and blood sample collection) in the context of COVID-19 pandemic [3]. Artificial intelligence algorithms were also proposed for COVID-19 computer-assisted diagnosis (see, for example, *ai-corona* [4]), but an appropriate evaluation is needed before implementation as current practice.

Keywords: Diagnostic Techniques and Procedures; Monitoring; Artificial intelligence (AI); Wearable

References

1. Evans KD, Yang Q, Liu Y, Ye R, Peng C. Sonography of the lungs: diagnosis and surveillance of patients with COVID-19. *J Diagn Med Sonogr.* 2020;36(4):370-6. doi: 10.1177/8756479320917107.
2. Abdulrazaq APDM, Hazairin N, Al-Zubaidi S, Karim S, Mustapha S, Yusuf E. Toward a novel design for Coronavirus detection and diagnosis system using IoT based drone technology. *Int J Psychosoc Rehabil.* 2020;24:2287-95.
3. Anggraeni S, Maulidina A, Dewi MW, Rahmadiani S, Rizky YPC, Arinalhaq ZF, et al. The deployment of drones in sending drugs and patient blood samples COVID-19. *Indonesian J Sci Technol.* 2020;5(2):139-200.
4. Yousefzadeh M, Esfahanian P, Movahed SMS, Gorgin S, Rahmati D, Abedini A, et al. *ai-corona*: Radiologist-assistant deep learning framework for COVID-19 diagnosis in chest CT scans. *PLoS One.* 2021;16(5):e0250952. doi: 10.1371/journal.pone.0250952.