

# Telemedicine in home automated peritoneal dialysis (APD): preliminary experiences of remote patient monitoring through the IoMT

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Over the years, a progressive reduction of peripheral hospitals has affected the Calabrian territory, while elderly patients and chronic diseases have increased. During emergencies, such as the global pandemic caused by Sars-CoV-2, non-hospital health services could be essential for patients who cannot directly access treatment within hospital structures or for patients for whom hospitalization is not strictly required.

In this scenario, the *iCare Project*<sup>1</sup> identifies digital and innovative solutions for access to care by means of Information and Communication Technologies (ICT). The Project, taking as reference a Calabrian hub hospital, has created a platform for managing the procedures related to telemedicine services for different hospital wards. In this work, we focus on a Dialysis Centre by analyzing the treatment path of patients in home automatic peritoneal dialysis (APD).

Literature [1-2] shows the positive effects of remote patient monitoring (RPM) by comparing the modern *smart* cyclers to the traditional ones that include removable memory cards, which patients bring to the Dialysis Centre for check-ups and treatment modifications.

All these experiences are limited to some clinical data strictly linked to the APD treatment (duration, times, and volumes of dialysate flow) and neglect the analysis, storage, and management of other data such as the glycemic index and blood pressure, whose control and evaluation, even remotely, can improve and optimize the management and care of the dialysis patient [3].

An eHealth platform based on micro-services has been designed for real-time communication, storing, and analysis of data from various IoMT (Internet of Medical Things) devices. Through APIs, it will be possible to connect the platform with BWA (Body Water Analysis) devices. Finally, teleconsultation and teleassistance will enable a real-time connection between the patient and the Dialysis Centre.

The preliminary results obtained implementing the RPM paradigm in home APD with different clinical parameters confirm that it is possible to aid proactively, correctively, and preventively for the most common APD problems. Furthermore, significant clinical, economic, and social advantages could be achieved for the stakeholders involved, e.g., the reduction of urgent and non-urgent hospitalization, with a consequent improvement in the patient's quality of life and satisfaction for both healthcare professionals and patients in home APD.

[1] Nayak A, Karopadi A, Antony S, Sreepada S, Nayak KS. Use of a peritoneal dialysis remote monitoring system in India. *Perit Dial Int* 2012; 32(2):200-4.

[2] He T, Liu X, Li Y, Wu Q, Liu M, Yuan H. Remote home management for chronic kidney disease: A systematic review. *J Telemed Telecare* 2017; 23:3-13.

[3] Yi, C., Wang, X., Ye, H., Lin, J., & Yang, X. (2022). Patient-reported gastrointestinal symptoms in patients with peritoneal dialysis: the prevalence, influence factors and association with quality of life. *BMC nephrology*, 23(1), 1-8.

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