



## Editorial

 Telemedicine, an Opportunity for Spirometry<sup>☆</sup>

## Telemedicina, una oportunidad para la espirometría

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Forced spirometry is a fundamental procedure in the study of lung function that is essential in the evaluation and follow-up of respiratory diseases. Clinical guidelines published by respiratory societies<sup>1–3</sup> require this test to be performed by highly trained technicians. The guidelines of the Spanish Society of Pulmonology and Thoracic Surgery (SEPAR)<sup>1</sup> recommend that technicians receive structured training and at least 3 months' dedicated experience under the supervision of expert technicians, to ensure that they are minimally competent in the procedure. The SEPAR guidelines also state that up to 1 year of experience is necessary to become familiar with the equipment and to develop problem-solving skills. In 2012, the European Respiratory Society initiated a training program, the "European Spirometry Driving License",<sup>4</sup> to offer high-quality comprehensive training to practitioners.

The widespread use of spirometry in both primary care and specialized clinics has made quality control increasingly complex.<sup>5</sup> The quality of spirometries performed in primary care has always been questioned, due to the difficulty in achieving acceptable, interpretable results. In Navarre, Hueto et al.<sup>6</sup> found that adherence to guidelines is very limited, and the quality of 76% of the tests was unacceptable. Naberan et al.<sup>7</sup> also reported lack of adherence to guidelines, limited availability of the technique in primary care centers, and shortcomings in training. The situation is compounded by the high demand for spirometry technicians, which puts a severe strain on training resources. This situation inevitably generates significant diagnostic problems, since spirometry is the principal test for evaluating major chronic respiratory diseases, such as asthma and chronic obstructive pulmonary disease. Hueto et al.<sup>6</sup> reported that 39.7% of diagnoses were not supported by lung function data. Thus, if an acceptable spirometry is not available, the primary care doctor may have difficulty in managing the diagnosis, treatment, and follow-up of respiratory diseases.

In recent years, telemedicine has been shown to be a useful tool for transmitting and managing health information in various scenarios, and has also been used to improve the quality of spirometries. The Alliance study<sup>8</sup> collected a large amount of tele-spirometric data, sending traces by telephone, but in the absence of a training program, researchers observed a high percentage of poor quality spirometries. In this same project,<sup>9</sup> the authors concluded that evaluation of the test by an expert in the context of a telemedicine program could assist in the diagnosis of respiratory diseases. In their experience with online spirometries, Masa et al.<sup>10</sup> confirmed that telemedicine can be used to achieve quality tests, even online, with no direct contact with the patient. Several studies report that a one-off training course with no follow-up does not ensure adequate quality standards. Represas-Represas et al.<sup>11</sup> held a training program based on theoretical–practical workshops that improved technicians' skills, but the quality of the tests decreased over time. Pérez-Padilla et al.<sup>12</sup> developed a spirometry quality control program based on a 2-day in-person training course. They concluded that spirometry quality in geographically distant centers can be monitored using a centralized quality control program that regularly receives results by email. These studies appear to show the need for a structured training program that, if it is to be successful, must be maintained over time. Other authors have used telemedicine to reduce underdiagnosis in respiratory diseases. Castillo et al.<sup>13</sup> designed a program to provide spirometries in pharmacies, extending the reach of the test beyond the primary care centers.

One remarkable advance is the use of telemedicine to monitor the quality of spirometries performed in primary care.<sup>14</sup> Marina et al.<sup>15</sup> developed this tool and went on to study telemedicine quality monitoring of spirometries in the public health system of the Basque Country. After an initial 4-h in-person training course, tests were performed in 36 primary care centers, resulting in 80% good quality spirometries, a rate that could be maintained with the support of the telemedicine application. The program has now been extended to the entire Basque health system, and most primary care centers participate and submit their tests on a daily basis. The cost-effectiveness of the application has been supported by economic evaluation and analysis of the budgetary impact, taking into account the benefit of offering high-quality procedures.<sup>16</sup>

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Nowadays, advanced devices are available that do not require daily calibration or software updates,<sup>17,18</sup> and automatically determine test quality and detect technical errors. Such improvements are welcome and will be of assistance to professionals, but they are no substitute for the training and supervision of the technicians who perform these procedures.

These new technologies underline the value of a high-quality spirometry, obtained in any setting by properly supported, motivated professionals, that will provide all doctors working in the health system with reliable data to help them to appropriately manage respiratory diseases. Telemedicine, then, is a useful, cost-effective tool with proven quality and effectiveness, and its use in the different healthcare systems should be considered.

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