

**Validation of the algorithm for the monitoring and control of asthma through telemedicine.  
The Consensus COMETA Project.**

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Asthma is a common chronic respiratory condition [1]. The correct control of its symptoms, one of the main objectives of the treatment of asthma, is usually compromised [2]. COVID-19 pandemic could have jeopardized this lack of control even more [3,4]. Telemedicine has shown to improve control of symptoms, quality of life, and patient-reported outcomes of patients with asthma [5-7]. Besides, eHealth interventions seem to have a positive impact on the adherence and the satisfaction with inhalers, and the use of rescue medication [7-9].

The COMETA (Spanish acronym for *Control as Goal in the Era of Telemedicine in Asthma*) project arose with the following objectives: promoting the use of telemedicine for the control of asthma disease and training health professionals to adapt to telemedicine [10]. In a first step, a dedicated multidisciplinary scientific committee addressed patients' characteristics for teleconsultation -including each patient's willingness-; identified the existing problems for achieving a proper control of asthma; proposed several initiatives for mitigating them; and agreed on some telemedicine-based strategies for the care of patients with asthma (Supplementary Figure and supplementary material) [11]. In a second step, such an algorithm has been validated by a larger group of specialists.

The COMETA algorithm for teleconsultation was validated using the Delphi method (supplementary material). A total of 75 experts in pulmonology, allergology, family medicine, nursing, and community pharmacy participated. Inclusion criteria comprised: (a) having more than 5 years of experience with patients with asthma; (b) having used telemedicine within the last 6 months; (c) belonging to some respiratory disease task force for family medicine physicians and nurses, or to an asthma task force for community pharmacists.

The experts expressed their agreement with a Likert scale of 9 values, with being 1 the lowest agreement and 9 being the highest. The consensus was considered when 70% of participants or more expressed the same answer. The consultation was performed in two consecutive waves and the totality of the invited experts participated in both of them.

The mean age of participants was 50.3 years (standard deviation -SD- 9.1). The proportion of women was 56%. The mean number of patients visited per month was 58 (SD 57.1). The distribution by specialties and by type of sites, as well as the use of different telemedicine tools are specified in table 1.

All the asseverations related to the general perception of the COMETA algorithm were agreed by more than 70% of participants, excepting the inclusion of all the possible options for the correct action during teleconsultation, on which 28% of panellists differ (Supplementary table). This might be one of the limitations of the consensus, as other e-tools like tele-stethoscopes, home spirometers, or FeNO were not considered.

The need for a management system for the preparation of the teleconsultation was agreed upon by 97% of the participants. The notification of the teleconsultation and the attachment of the Asthma Control Test (ACT) and the 10-item Test of Adherence to Inhalers (TAI-10) to such notification were agreed by consensus. More than 85% of the participants agreed that patients should have their action plan, inhalers, and peak flow meter on hand for the visit. The review of medical records was agreed by consensus for physicians and nurses, but not for pharmacists, in order to face a teleconsultation. On the contrary, a review of medication collection was agreed as relevant for all of them.

The evaluation of treatment adherence, comorbidities, and inhalation technique during teleconsultation were considered necessary by the 99% of participants, while trigger and aggravating factors and control of symptoms were respectively considered by 89% and 80%. The agreement with the assessment of adherence by reviewing electronic pharmacy refill records and TAI-10 results was 97% and 93%, respectively. All the items exposed in the questionnaire to evaluate the inhalation technique were validated by consensus, except the referral to the pharmacist for their face-to-face assessment. All the key points related to the assessment of trigger and aggravating factors were agreed by 99% of participants. All the items exposed in the questionnaire to report asthma control were validated by 85% of participants or more.

The totality of participants agreed on considering the review and the adjustment of the treatment strategy and the action plan at the teleconsultation closing. All the items related to scheduling new visits were agreed by 80% of participants or more.

The COMETA algorithm for teleconsultation of patients with asthma has been widely validated in this work by a large and multidisciplinary group of experts. From 55 items, only three have not been agreed and two of them referred to the role of pharmacists in the review of medical records and inhalation technique. Some gaps between how specialists would like to perform teleconsultation and the currently available tools have been detected. For instance, the assessment of the inhalation technique requires videoconference support, but only 11% of the participants of this study declared to regularly use video platforms.

Participants also commented about the lack of proper resources, such as peak flow meters or spirometers, for successful teleconsultation. Additionally, some experts highlighted the need for inquiring the patient about self-medication practices, the collection of medication with a private prescription, and the real use of the prescribed treatment to correctly assess adherence. The role of the professionals who are to intervene at each step of the algorithm, as previously detailed in the consensus document<sup>11</sup>, was also evaluated by the participants.

The increasing ability and willingness of patients to access the internet and use technological tools to control and monitor their chronic diseases may favour the use of telemedicine. Moreover, it has been described that telemonitoring increases the empowerment of patients and their involvement in disease management [12,13] and can be cost-effective [14]. Equally, teleconsultation is an important tool to support healthcare providers to monitor and manage chronic diseases without the need for face-to-face visits [14]. Considering this landscape, the COMETA algorithm for teleconsultation entails a useful tool at the present time, in which specific legislation regarding telemedicine is being developed in the European setting [15].

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### **Conflict of Interests**

CAS has received fees in the last 3 years for giving lectures, scientific advice, participation in clinical studies, or writing publications for (in alphabetical order): ALK, AstraZeneca, Boehringer Ingelheim, Chiesi, GlaxoSmithKline, Novartis, and Pfizer. CAS declares not receiving ever, directly or indirectly, funding from the tobacco industry or its affiliates. JDO reports personal fees from ASTRAZENECA, personal fees from GSK, personal fees from SANOFI, personal fees from NOVARTIS, personal fees from TEVA, personal fees from BIAL, personal fees from CHIESI, outside the submitted work. VP reports grants and personal fees from Astrazeneca, personal fees from Boehringer-Ingelheim, personal fees from Merck, grants and personal fees from Chiesi, personal fees from Novartis, grants from Menarini, personal fees from Sanofi, outside the submitted work. The remaining authors declare no conflicts of interest.

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**Table. Distribution of participants**

<b>Characteristics</b>	<b>% of participants (n = 75)</b>
Specialties	
Allergologists	24.0%
Pulmonologists	24.0%
Family medicine specialists	24.0%
Community pharmacists	13.3%
Nurses specialised in family medicine	6.7%
Nurses specialised in allergology	4.0%
Nurses specialised in pulmonology	4.0%
Entitlement of working centre	
Public	97.3%
Mixt	2.7%
Private	0.0%
Type of working centre	
Primary care	44.0%
Third level hospital	45.0%
Second level hospital	8.0%
First level hospital	3.0%
Frequent use of telemedicine tools (daily or weekly basis)	
Telephone calls	91.0%
Messaging tools	32.0%
Social network	30.0%
email	48.0%
Videoconference platforms	11.0%