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Special article

[Translated article] Advances in the work of multidisciplinary teams for the care of patients with severe uncontrolled asthma. A post-COVID vision (TEAM 2.0 project)

Mónica Climente-Martí[a,*], Manuela Alvarado-Arenas[b], Pilar Ausín-Herrero[c], Cristina Benito-Bernáldez[d], Nuria Carballo-Martínez[e] and Julio Delgado-Romero[f], Equipo del Proyecto TEAM 2.0 (Trabajo en Equipos de Asma Multidisciplinares) (Anexo 1)

[a] *Servicio de Farmacia Hospitalaria, Hospital Universitario Doctor Peset, Valencia, Spain*
[b] *Servicio de Alergología, Hospital San Pedro de Alcántara, Cáceres, Spain*
[c] *Servicio de Neumología, Hospital del Mar, Barcelona, Spain*
[d] *Servicio de Neumología, Hospital Universitario Virgen Macarena, Sevilla, Spain*
[e] *Servicio de Farmacia Hospitalaria, Hospital del Mar, Barcelona, Spain*
[f] *Servicio de Alergología, Hospital Universitario Virgen Macarena, Sevilla, Spain*

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ABSTRACT

Asthma is a chronic respiratory disease with a high health, social and economic impact, particularly in the case of Severe Uncontrolled Asthma (SUA). For this reason, new strategies are especially necessary to improve its approach, with a personalized approach to each patient and from a multidisciplinary perspective, in addition to integrating the new telemedicine and telepharmacy practices promoted as a result of the COVID-19 pandemic.

In this context, the TEAM 2.0 project ("Work in Multidisciplinary Asthma Teams") has been developed, following the TEAM project carried out in 2019, with the aim of updating and prioritizing good multidisciplinary work practices in SUA in a post pandemic context and analyze the progress made.

A coordinating group, made up of eight multidisciplinary teams of hospital pharmacists, pulmonologists, and allergists, carried out an updated bibliographic review, sharing of good multidisciplinary practices, and analysis of advances. Through five regional meetings with other experts with experience in SUA, the good practices identified were shared and subjected to debate, evaluation and prioritization.

In total, 23 good multidisciplinary work practices in SUA, grouped into five work areas: 1) *Organization of work in multidisciplinary teams*, 2) *Patient education, self-management and adherence*, 3) *Health results, data monitoring and persistence*, 4) *Telepharmacy and experiences implemented during the COVID-19 pandemic* and 5) *Training and research*, were evaluated and prioritized by 57 professionals from the field of Hospital Pharmacy, Pulmonology, Allergology and Nursing. This work has made it possible to update the roadmap of priority actions to continue advancing in optimal models of care for patients with AGNC in a post-COVID-19 context.

Avances en el trabajo de equipos multidisciplinares para la atención al paciente con asma grave no controlada. Una visión post-COVID (Proyecto TEAM 2.0)

Palabras clave:
Asma Grave No Controlada
Buenas prácticas
Equipo interdisciplinar
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Telemedicina
Telefarmacia

RESUMEN

El asma es una enfermedad respiratoria crónica con un alto impacto sanitario, social y económico, en particular, en el caso del Asma Grave No Controlada (AGNC). Por ello, son especialmente necesarias nuevas estrategias para mejorar su abordaje, con un enfoque personalizado a cada paciente y desde una perspectiva multidisciplinar, además de integrar las nuevas prácticas de telemedicina y telefarmacia impulsadas a raíz de la pandemia de COVID-19.

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* Corresponding author.
E-mail address: climente_mon@gva.es (M. Climente-Martí).

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En este contexto se ha desarrollado el proyecto TEAM 2.0 ("Trabajo en Equipos de Asma Multidisciplinares"), continuación del proyecto TEAM llevado a cabo en 2019, con el objetivo de actualizar y priorizar buenas prácticas de trabajo multidisciplinar en AGNC en un contexto post pandemia y analizar los avances conseguidos.

Un grupo coordinador, constituido por ocho equipos multidisciplinares de farmacéuticos hospitalarios, neumólogos y alergólogos, llevó a cabo una revisión bibliográfica actualizada, puesta en común de buenas prácticas multidisciplinares y análisis de avances. A través de cinco reuniones regionales con otros expertos con experiencia en AGNC, se compartieron las buenas prácticas identificadas y fueron sometidas a debate, evaluación y priorización.

En total, 23 buenas prácticas de trabajo multidisciplinar en AGNC, agrupadas en cinco ámbitos de trabajo: 1) *Organización del trabajo en equipos multidisciplinares*, 2) *Educación al paciente, autoadministración y adherencia*, 3) *Resultados en salud, seguimiento de datos y persistencia*, 4) *Telefarmacia y experiencias implantadas durante la pandemia de COVID-19* y 5) *Formación e investigación*, fueron evaluadas y priorizadas por 57 profesionales del ámbito de la Farmacia Hospitalaria, la Neumología, la Alergología y la Enfermería. Este trabajo ha permitido actualizar la hoja de ruta de acciones prioritarias para seguir avanzando en modelos óptimos de atención al paciente con AGNC en un contexto post-COVID-19.

Introduction

Asthma is a chronic respiratory disease with high health, social, and economic impacts, which affects about 334 million people worldwide[1].

Severe uncontrolled asthma (SUA) is defined as asthma that remains uncontrolled despite maintenance treatment administered according to the advanced therapeutic steps established in the clinical guidelines[2,3]. This form of asthma affects 5% to 10% of the total population with asthma and is associated with greater morbidity, mortality, and poorer quality of life[4]. The economic costs of SUA are higher than those of moderate asthma, both in the consumption of health care resources and in indirect costs, which, among other factors, are due to absenteeism from work[5–7].

Because of the special relevance and magnitude of SUA, new strategies are needed to optimize treatment and improve disease control and health outcomes in this group of patients. In recent years, the approach to this type of asthma has been undergoing changes, moving toward more personalized approaches that are adapted to the needs of each patient[8,9].

These new strategies, together with the heterogeneity and complexity of SUA, require the development of a multidisciplinary approach that involves a wide range of professional roles in its diagnosis, evaluation, treatment, and follow-up[2,3]. In this regard, it has been shown that the multidisciplinary approach to asthma achieves better health care outcomes and is cost-effective[10,11]. Thus, for many years, the Spanish Society of Allergology and Clinical Immunology (SEPAR) and the Spanish Society of Pneumology and Thoracic Surgery (SEAIC) have promoted several quality accreditation systems for asthma units, leading to an increase in the number of accredited units operating under this multidisciplinary approach.

The healthcare crisis caused by SARS-CoV-2 posed a strong challenge for healthcare systems, which have had to adapt their work methods and procedures to provide a better response to patients. Previous studies have shown that tools such as telemedicine and telepharmacy can have positive impacts on asthma control and the patients' quality of life[14], with the COVID-19 pandemic providing a strong impetus to these types of services[12,13]. The experience of hospital pharmacies is increasingly valued and required by these multidisciplinary teams and units in relation to the optimization of treatment and follow-up of patients with complex chronic diseases, the treatment of patients receiving biologic drugs, the development of telepharmacy, patient information and follow-up, and the measurement of adherence to treatment and health outcomes[15].

In 2019, the TEAM project ("Working in Multidisciplinary Asthma Teams")[16] was launched, with the aim of identifying and sharing good practices and experiences of working in multidisciplinary teams in SUA and of helping to consolidate collaborative and multidisciplinary work experience in this field. Two years after the first project was conducted, in 2021, a second edition of the project was developed in a post-pandemic setting, with the aim of reviewing the progress achieved, updating good practices, and continuing to promote multidisciplinary work and the role of hospital pharmacies in the care of patients with SUA.

Methodology

A coordinating expert group was formed with the aim of guiding and guaranteeing quality in the execution of the project. The group comprised 8 multidisciplinary teams, all of which included a hospital pharmacist (HP) and at least 1 pulmonologist or allergist from the same hospital centre with experience in the management of patients with SUA. A total of 21 healthcare staff formed the TEAM 2.0 coordinating expert group: 7 pulmonology specialists, 5 allergology specialists, and 9 hospital pharmacy specialists from 8 hospitals and 7 Autonomous Communities (Andalusia, Canary Islands, Catalonia, Valencian Community, Community of Madrid, Extremadura, and Galicia).

The study was organized in 2 consecutive phases (Fig. 1).

Phase 1. Update of good practices

During this phase, a literature review was conducted on the multidisciplinary approach to SUA with the aim of providing a post-COVID-19 perspective in relation to first edition of the TEAM project. To this end, the Pubmed database was used to search for entries published from 2019 onward using as search terms "severe uncontrolled asthma", "multidisciplinary team", and "hospital pharmacy". Thus, the literature identified in the first project, which used a similar methodology, was updated with entries published since 2019. Subsequently, the coordinating expert group, based on their criteria and experience, reviewed the search and completed it through a search of gray literature on the Internet.

Likewise, the 8 multidisciplinary teams reviewed the experiences collected during the first edition of the TEAM project, reviewed their degree of progress, and, in consequence, suggested new good practices or improvements to previous actions. All these experiences were pooled and discussed at a working meeting. The conclusions of this meeting, and the previous literature review, facilitated the creation of a preliminary list of updated good practices. This preliminary list underwent successive rounds of online review by the different teams based on their experience and knowledge, thus creating a final list of good practices on the multidisciplinary approach to SUA, which was validated by the entire coordinating group. The updated good practices were grouped into 5 work areas: 1) organization of work in multidisciplinary teams;

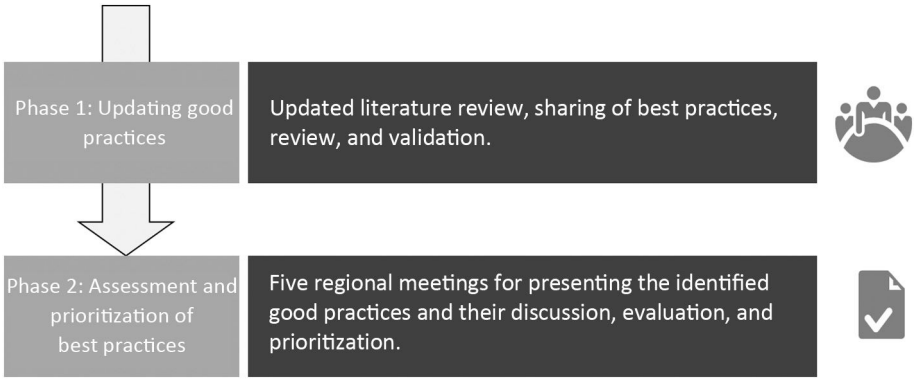

Fig. 1. Methodological phases of the project.

2) patient education, self-administration, and adherence; 3) health outcomes, data monitoring, and persistence; 4) telepharmacy and experiences implemented during the COVID-19 pandemic; and 5) training and research.

Phase 2. Assessment and prioritization of best practices

From September 2021 to March 2022, 5 regional meetings were held led by the multidisciplinary teams that comprised the coordinating expert group of the hospitals in each region. In these meetings, the coordinating expert group presented the best practices identified during Phase 1 and discussed them with the participants. The participants evaluated and prioritized these good practices on a scale of 1 to 10 (1 being "very low priority" and 10 "very high priority"). The degree of implementation of actions in their work centres was used as a criterion for establishing priorities, such that actions with a high degree of progress or implementation were assigned a lower priority due to such progress or implementation. The evaluations were collected by means of a real-time online polling system (Slido)[17]. For each good practice identified, we calculated the average score of the priorities assigned by the participants in the 5 regional meetings.

Results

A total of 23 good multidisciplinary work practices were identified and classified into 5 areas of work based on the literature review, the sharing of experiences by the coordinating expert group, and the successive rounds of online review.

The 5 regional meetings were attended by a total of 57 healthcare staff with experience in managing SUA: 37% were HP specialists, 26% pulmonologists, 25% allergists, and 2% nursing staff. Participants comprised healthcare staff from 11 Autonomous Communities.

Table 1 shows the complete list of the good practices identified and the mean scores of the priorities assigned by the participants in the regional meetings.

Overall quartile: quartile to which each action belongs in relation to the overall ranking; *SD*: standard deviation of the scores obtained for each action; *Mean*: arithmetic mean of the scores obtained for each action; *Thematic rank*: position in the ranking of prioritization of good practices within each specific thematic block; *Overall rank*: position in the overall ranking of prioritization of all the good practices identified.

In the area of work *Organization of Work in Multidisciplinary Teams*, priority was given to actions related to the development of specific registries for patients with SUA and the development of multidisciplinary protocols.

Regarding actions in the area of work *Patient Education, Self-Administration, and Adherence*, a high priority was assigned to continue making progress in the use of specific questionnaires to assess therapeutic adherence and to implement specific tools for the follow-up of self-administration patients.

The coordinating expert group assigned a high priority to the measurement of *Health Outcomes, Data Follow-Up, and Persistence* from a multidisciplinary perspective, with special priority being given to actions related to the development and measurement of indicators that can better evaluate the degree of response to treatment, the incorporation of Patient-Reported Outcomes (PRO), and participation in multidisciplinary health outcome evaluation studies. All these actions had scores that were above the mean of the data range, with the first (*Organization of Work in Multidisciplinary Teams*) standing out for being within the top 25% of the best practices with the highest priority.

Within the area of work *Telepharmacy and Experiences Implemented During the COVID-19 Pandemic*, the development of telematic pharmaceutical care consultations was assigned a high position in the general ranking of prioritization. Of note, within the same area of work, the action of developing a teleconsultation system for SUA adapted by patient profile was assigned a slightly lower priority, but was still above the mean of the set of actions.

Finally, in the area of *Training and Research*, two actions in particular were assigned high priorities: to promote the rotation of residents from different specialties in asthma units; and to participate in multidisciplinary research studies that include PRO in the evaluation of results.

Discussion

Although a structured consensus methodology was not used in the different review rounds to which the preliminary list of good practices was submitted, this aspect was partly compensated for by the large number of experts who made up the coordinating group, as well as by the fact that different organizational models and health systems from several autonomous communities were represented, which gave the final list of the 23 good practices a solid basis for the subsequent prioritization of actions.

Thus, 2 years after the first edition, the second edition reviewed the degree of progress and established new priorities for action in a post-pandemic setting. As clarified in the reflection sessions, advances in therapy and knowledge have made it increasingly feasible to personalize the approach to SUA, which evidently requires progress in multidisciplinary care models. The impact of the pandemic on healthcare systems has provided an impetus to promote changes in structural organization and has highlighted, even more, the need to use technological tools that improve, rather than hinder, the relationship between professionals and patients.

Adherence to treatment is one of the main factors affecting the control of severe asthma; it has been estimated that up to 74% of cases of

Table 1
Prioritization of actions by area of work.

TOPIC 1: Organization of work in multidisciplinary teams					
Good practices	Thematic rank	Overall rank	Overall quartile	Mean	SD
Development of specific registries for patients with SUA	1st	2nd	Q1	8.73	1.28
Development of specific multidisciplinary protocols	2nd	3rd	Q1	8.69	1.32
Development of specific circuits for referral to the unit	3rd	11th	Q2	8.29	1.33
Accreditation of the Asthma Unit under quality systems	4th	20th	Q4	7.67	2.25
Creation of a Hospital Pharmacy consultation	5th	21st	Q4	7.62	2.35
Creation of a Nursing consultation	6th	22nd	Q4	7.54	2.36
Incorporation of new professional roles, expansion of the multidisciplinary team	7th	23rd	Q4	7.44	1.82
TOPIC 2: Patient education, self-administration, and adherence					
Good practices	Thematic rank	Overall rank	Overall quartile	Mean	SD
Use of specific questionnaires to assess therapeutic adherence	1st	10th	Q2	8.33	1.41
Implementation of specific tools for monitoring patients on self-administration (calendars, alarms, medication delivery, etc)	2nd	12th	Q2	8.28	1.71
Establishment of multidisciplinary criteria for patients who are candidates for self-administration	3rd	17th	Q3	7.94	2.13
TOPIC 3: Health outcomes, data follow-up, and persistence					
Good practices	Thematic rank	Overall rank	Overall quartile	Mean	SD
Use of questionnaires to estimate the degree of response to treatment	1st	6th	Q1	8.43	1.60
Incorporation of PRO in outcome evaluation	2nd	7th	Q2	8.41	1.48
Participation in multidisciplinary health outcome evaluation studies	3rd	8th	Q2	8.35	1.53
Establish multidisciplinary criteria to assess the appropriateness of persistence of treatment with biologics	4th	13th	Q3	8.28	1.97
Use of quality-of-life questionnaires	5th	18th	Q3	7.73	1.89
TOPIC 4: Telepharmacy and experiences implemented during COVID-19					
Good practices	Thematic rank	Overall rank	Overall quartile	Mean	SD
Development of telematic pharmaceutical care consultations	1st	5th	Q1	8.64	1.27
Develop a teleconsultation system for SUA adapted by patient profile	2nd	9th	Q2	8.34	1.35
Consolidate home dispensing programs adapted to patients with SUA	3rd	15th	Q3	8.09	1.44
Develop protocols adapted to health emergency situations such as COVID-19 (appointment spacing, increased doses, etc)	4th	16th	Q3	8.03	1.59
TOPIC 5: Training and research					
Good practices	Thematic rank	Overall rank	Overall quartile	Mean	SD
Promote the rotation of multidisciplinary residents in SUA units	1st	1st	Q1	8.83	1.58
Participation in multidisciplinary research studies that include PROs	2nd	4th	Q1	8.66	1.28
Development of studies for the stratification of patients with SUA that include the socioeconomic perspective	3rd	14th	Q3	8.17	1.67
Promote doctoral studies by the multidisciplinary SUA team	4th	19th	Q4	7.69	1.92

Thematic rank: position in the ranking of prioritization of good practices within each specific thematic block; Overall rank: position in the general ranking of prioritization of all the good practices identified; Overall quartile: quartile to which each action belongs with respect to the general ranking. Mean: arithmetic mean of the scores obtained by each action; SD: standard deviation of the scores obtained by each action; SUA, severe uncontrolled asthma; PRO, Patient-Reported Outcomes.

SUA are caused by external factors, including poor adherence to treatment[18]. As mentioned above, according to expert opinion, one of the highest priorities is to implement the use of specific questionnaires to estimate therapeutic adherence, given the need to adequately assess patients and identify individuals at risk of poor adherence and thus achieve improved disease control. In this regard, the meetings highlighted the use of the Inhaler Adherence Test (TAI), which was designed and validated by SEPAR for the assessment of adherence to inhaled therapy[19]. Recent literature has shown that the capacity to identify poor adherence can be increased by combining the validated TAI with pharmacy refill records[20].

Another adherence-related area is the self-administration of biologic drugs. In this regard, a recent survey showed that the main concern of healthcare staff is the issue of patients forgetting to administer their medications[21]. Thus, the participants established as a high priority action the implementation of specific tools to ensure adherence to self-administered biologics, and to provide patients with calendars, reminders via mobile messaging, or apps to facilitate adherence, among other features that could help patients manage the disease and assist healthcare professionals in telemonitoring.

Regarding the area *Organization of Work in Multidisciplinary Teams*, the project gave high priority to the improvement of specific registries by collecting patient data of interest in a standardized manner (e.g. weight, number of annual oral corticosteroid cycles, or annual exacerbations). This information improves patient follow-up, the statistical use of the information for research purposes, decision-making on treatment optimization and evaluation of results, and the management of the units themselves. The development and improvement of information systems was also of high priority interest in the first edition of the project[16], which highlights the ongoing and pressing need for improvements in this type of action in multidisciplinary asthma units.

The first edition of the project also gave high priority to the establishment of specific multidisciplinary protocols, which remained a high priority in the second review, given that this action was given a significantly higher level of prioritization by the expert group. In relation to this aspect, and in line with the main clinical practice guidelines[2,3], the group discussed the need to develop specific multidisciplinary protocols to optimize therapeutic strategies and establish algorithms for decision-making on the initiation of treatment with biologics[22].

Regarding work organization, the group stressed the desirability of establishing specific referral circuits from emergency services and primary care to asthma units, and the need to further develop the definition of referral criteria for patients experiencing an asthmatic crisis who could be treated in multidisciplinary asthma units[23,24].

The area of multidisciplinary work on *Health Outcomes, Data Monitoring, and Persistence*, despite its challenges, was also considered a high-priority area due to its different implications and utility. The

project highlighted the difficulty of implementing in routine practice the assessment of variables typically used in clinical trials to evaluate the degree of response to treatment with biologics, such as the rate of exacerbation, pulmonary function, the need for corticotherapy, or the Asthma Control Test (ACT)[25,26]. In regard to this aspect, tools need to be developed that can assess the degree of response to biologics from a more holistic perspective, while taking into account the dynamic nature of asthma control. Thus, it would be desirable to promote the use of scales, such as the FEV1, Exacerbations, Oral Corticosteroids, Symptoms (FEOS) score, which is a multidimensional tool that provides an objective measure of patient improvement associated with biologic therapy[27].

Another priority action is the inclusion of PRO measures in the evaluation of health outcomes in patients with asthma, such as the Asthma Quality of Life Questionnaire (AQLQ) or the mini-AQLQ[28], given that they contribute to a more complete picture of patient-perceived quality of life and of the quality of the overall approach by the healthcare system as a whole[29].

The COVID-19 health emergency has driven the implementation and development of telecare and telepharmacy which, in the opinion of the expert group, should be further developed to guarantee their optimal functioning while taking into account the particularities of the patients. Specifically, hospital pharmacies involved in asthma units have developed systems for clinical follow-up, adherence monitoring, evaluation of health outcomes, and non-face-to-face pharmaceutical care[15]. Within the framework of the project, one of the best practices prioritized was the development of telematic pharmaceutical care consultations. Thus, and in line with the recommendations of the main scientific societies[12,13,15], hospital pharmacy services should promote telepharmacy as a complementary tool in outpatient pharmaceutical care, adapt to the individual needs of patients, and seek to humanize health care. These services should be developed in coordination with the pulmonology and allergology services, with the aim of optimizing patient benefit and guaranteeing excellence in interdisciplinary care for patients with SUA.

Consistent with the results of the first edition of the project developed in 2019[16], the participating experts considered it a high priority to continue training residents in multidisciplinary asthma units through rotations of the different specialties, including hospital pharmacy residents, as a way to promote multidisciplinary and collaborative work in asthma from the beginning of resident medical intern and resident pharmaceutical intern training.

In conclusion, the second edition of the TEAM project reviewed advances in the multidisciplinary approach to asthma, while including the opinions of 57 healthcare staff from the fields of hospital pharmacy, pneumology, allergology and nursing. This reflection has facilitated updating the roadmap of priority actions to continue improving optimal models of care for patients with SUA in a post-COVID-19 setting.

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Authorship

The expert panel was selected by Astrazeneca Farmacéutica Spain, S.A.: however, the content, data analysis, data interpretation, and development of the manuscript were the full responsibility of the authors in independence of Astrazeneca Farmacéutica Spain, S.A.

Details on each author's contribution to the study are given below:

	Concept	Design	Definition of intellectual content	Literature search	Clinical studies	Experimental studies	Data collection	Data analysis	Statistical analysis	Manuscript preparation	Manuscript writing	Manuscript revision	Guarantor
Mónica Climente	X	X	X	X				X		X	X	X	
Manuela Alvarado	X	X	X	X				X		X	X	X	
Pilar Ausín	X	X	X	X				X		X	X	X	
Cristina Benito	X	X	X	X				X		X	X	X	
Nuria Carballo	X	X	X	X				X		X	X	X	
Julio Delgado	X	X	X	X				X		X	X	X	
Luis Fernández Lisón	X	X	X	X				X		X	X	X	
Mar Gandolfo	X	X	X	X				X		X	X	X	
Eva García Rebolledo	X	X	X	X				X		X	X	X	
José Carlos García Robaina	X	X	X	X				X		X	X	X	
Víctor López García	X	X	X	X				X		X	X	X	
Eva Martínez Moragón	X	X	X	X				X		X	X	X	
José Manuel Martínez Sesmero	X	X	X	X				X		X	X	X	
Vicente Merino	X	X	X	X				X		X	X	X	
Luis Pérez de Llano	X	X	X	X				X		X	X	X	
Celia Pinedo	X	X	X	X				X		X	X	X	
Inmaculada Plasencia	X	X	X	X				X		X	X	X	
Miguel Ángel Racionero	X	X	X	X				X		X	X	X	
Teresa Robledo	X	X	X	X				X		X	X	X	

(*continued*)

	Concept	Design	Definition of intellectual content	Literature search	Clinical studies	Experimental studies	Data collection	Data analysis	Statistical analysis	Manuscript preparation	Manuscript writing	Manuscript revision	Guarantor
Manuel Agustín Sojo	X	X	X	X				X		X	X	X	
María Dolores Zamora	X	X	X	X				X		X	X	X	

Conflicts of interest

The research presented in this manuscript was conducted by Ascendo Consulting Sanidad & Farma, Madrid, Spain.

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Annex 1

TEAM 2.0 Project Team (Working in Multidisciplinary Asthma Teams):

Luis Carlos Fernández-Lisón, Servicio de Farmacia Hospitalaria, Hospital San Pedro de Alcántara, Cáceres, Spain.

Mar Gandolfo-Cano, Servicio de Alergología, Hospital Universitario de Fuenlabrada, Madrid, Spain.

Eva María García-Rebolledo, Servicio de Farmacia Hospitalaria, Hospital Universitario de Fuenlabrada, Madrid, Spain.

José Carlos García-Robaina, Servicio de Alergología, Hospital Universitario Nuestra Señora de la Candelaria, Santa Cruz de Tenerife, Spain.

Víctor Manuel López-García, Servicio de Farmacia Hospitalaria, Hospital Universitario Lucus Augusti, Lugo, Spain.

Eva Martínez-Moragón, Servicio de Neumología, Hospital Universitario Doctor Peset, Valencia, Spain.

José Manuel Martínez-Sesmero, Servicio de Farmacia Hospitalaria, Hospital Clínico San Carlos, Madrid, Spain.

Vicente Merino-Bohórquez, Servicio de Farmacia Hospitalaria, Hospital Universitario Virgen Macarena, Sevilla, Spain.

Luis Pérez-de-Llano, Servicio de Neumología, Hospital Universitario Lucus Augusti, Lugo, Spain.

Celia Pinedo-Sierra, Servicio de Neumología, Hospital Clínico San Carlos, Madrid, Spain.

Inmaculada Plasencia-García, Servicio de Farmacia Hospitalaria, Hospital Universitario Nuestra Señora de la Candelaria, Santa Cruz de Tenerife, Spain.

Miguel Ángel Racionero-Casero, Servicio de Neumología, Hospital Universitario de Fuenlabrada, Madrid, Spain.

Teresa Robledo-Echarren, Servicio de Alergología, Hospital Clínico San Carlos, Madrid, Spain.

Manuel Agustín Sojo-González, Servicio de Neumología, Hospital San Pedro de Alcántara, Cáceres, Spain.

María Dolores Zamora-Barrios, Servicio de Farmacia Hospitalaria, Hospital Clínico San Carlos, Madrid, Spain.

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