

Position statement of expert panel of the Polish Allergology Society (PTA) on the management of patients with bronchial asthma and allergic diseases during the SARS-CoV-2 pandemic

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The Polish Allergology Society was one of the first to establish an expert panel which on 30 March 2020 presented its position statement on the management of patients with bronchial asthma and allergic diseases during the SARS-CoV-2 pandemic^{1,2}. Most of the recommendations and opinions presented in this statement continue to be valid until now. However, the dynamically changing epidemiological situation related to SARS-CoV-2 infection poses new challenges for pulmonologists and allergists. Numerous published clinical observations and studies provide new information on asthma and allergic diseases in relation to the COVID-19 pandemic. The present document contains new recommendations in line with the available knowledge and taking into account the opinions of other organisations and societies, both national and international.

Introduction

Both allergic diseases themselves, affecting many organs, especially the respiratory system, and the procedures used by allergists give rise to a number of questions about the proper management during the pandemic. This position statement aims to provide allergists with recommendations on the proper management of patients in the current epidemiological

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situation. One should be aware of the still limited amount of documented information on the COVID-19 disease itself, as well as its course in patients with asthma and allergies. Therefore, we would like to point out that in individual situations the final decision on the procedure is to be made by a doctor who has direct and full knowledge of the patient's condition and expectations, as well as viable options available. Both the limited amount of data on the association between COVID-19 and allergies, and the fact that only few organizations of allergists have developed current guidelines of conduct so far, have made it necessary for us to reach a consensus on the recommendations among Polish experts³.

A. General recommendations for dealing with the SARS-CoV-2 pandemic

Asthma and allergy patients should follow general principles of prevention, which can reduce the risk of infection. It is particularly reasonable to limit social contacts, maintain appropriate physical distance from other people and systematically wash one's hands. (Recommendations for allergists attending asthmatic and allergic patients during the SARS-CoV-2 pandemic are presented in the final chapter.)

The symptoms of SARS-CoV-2 infection and virus-induced COVID-19 disease may resemble those of exacerbating allergic diseases. The dominant symptoms – in addition to elevated temperature – include dyspnea, coughing, nose leakage and blockage, olfactory and taste disorders, headaches; there are also skin symptoms⁴. A physical examination performed by an allergist including an examination of the upper respiratory tract entails an increased risk of infecting the doctor. Functional lung tests also involve the risk of virus transmission. In addition, treatment, especially administration of drugs in the form of nebulization, leads to the generation of aerosol which may contain virus particles.

The following are the general rules of conduct applicable to all doctors during the pandemic (5, 6, 7, 8, 9):

1. Telephone contact should be the basic means of the doctor-patient communication. Apart from a phone call, online contact is also possible, sending test results by e-mail, or issuing electronic prescriptions and sick leave notes.

2. Each personal visit of a patient to the office should be preceded by a teleconsultation, during which the allergist should assess the risk of SARS-CoV-2 infection. If such infection is suspected, the National Health Inspection Authority (SANEPID) should be notified and the patient should be referred to a test for the presence of the virus's genetic material in the nasopharynx. A single negative result does not rule out infection when the clinical picture suggests COVID-19 or the patient had contact with a person with confirmed COVID-19.

3. SARS-CoV-2 infection should be taken into account in case of any exacerbation of respiratory symptoms caused by an acute respiratory infection. Such a suspicion should be reported to SANEPID and the patient should be referred to a virus test.

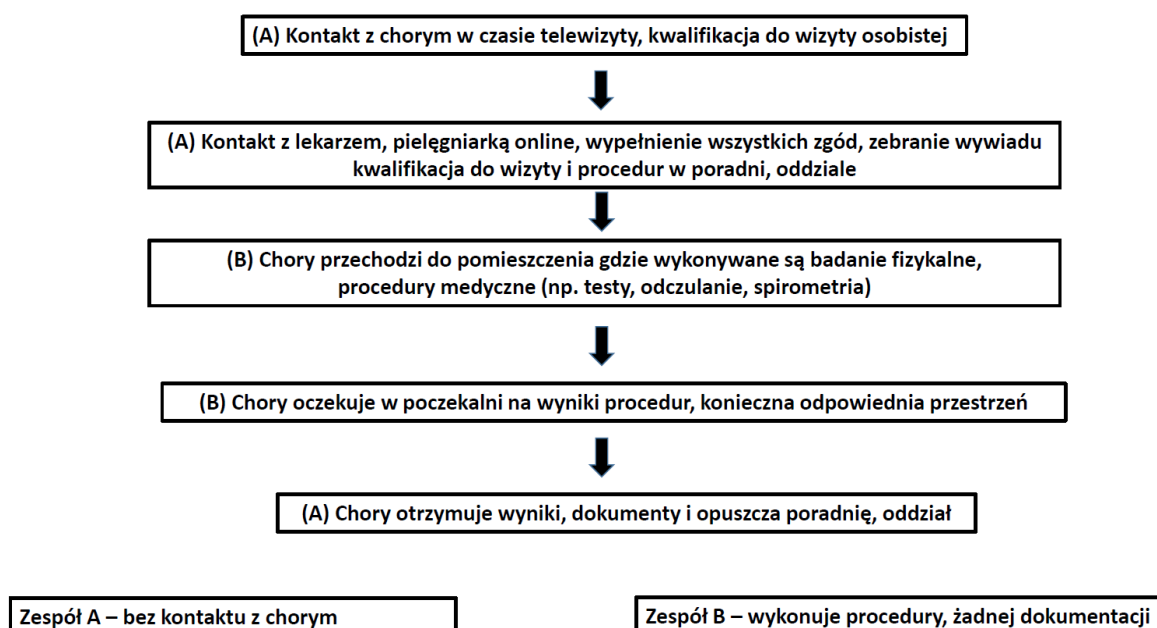
4. For each patient arriving at the health care centre, epidemiological history should be taken once again and the body temperature should be measured (forehead, temple, neck) with a non-contact device.

5. The allergist's equipment during each patient's personal visit should include a fit-tested FFP2/FFP3 mask, goggles, visor, plastic apron, gloves, cap or other hair protection. The plastic apron and gloves should be replaced for successive patients treated as COVID-19(+), in which case FFP3 masks should be used.

6. During the visit, the patient should wear a surgical mask, or a cotton or other mask recommended during a pandemic.

7. Donning and doffing of protective equipment should follow the recommendations of the ECDC and the National Consultant for Communicable Diseases (7, 8).

General diagnostic, therapeutic and organisational recommendations for patient management during the COVID-19 pandemic can be found in the document issued by Agencja Oceny Technologii Medycznych (AOTM) (7). At an allergist's office, the division of the medical and nursing team into 2 parts may be considered. The first one (A) can focus on teleconsultations and remote work with patients, while the other (B) should be equipped with appropriate equipment necessary for safe physical examination of patients and implementation of necessary medical procedures (Fig. 1).



(A) Contact with the patient during televisit, qualification for a personal visit	
(A) Online contact with a doctor, nurse, filling in all consents, taking history Qualification for a visit and procedures in the clinic, ward	
(B) The patient moves to a room where physical examinations, medical procedures (e.g. tests, desensitisation, spirometry) are performed	
(B) The patient waits in the waiting room for the results of the procedures; necessary space is required	
(A) The patient receives results, documents and leaves the clinic, ward	
Team A – without contact with the patient	Team A – without contact with the patient

The doctor should also give the patient general recommendations on how to manage during the pandemic (Table 1).

B. Susceptibility of patients with bronchial asthma and allergies to SARS-CoV-2 infection

Asthma patients show a reduced local immune response, with lower production of type I and III interferons in response to rhinovirus and paramyxovirus infections associated with common cold^{10,11}, although this is not confirmed by all studies^{12,13}. Respiratory viral infections in asthmatic patients are more frequent and cause serious exacerbations. Coronaviruses (mild strains) are found relatively often during exacerbations of bronchial asthma; one of the meta-analyses have shown that they are present on average in 8.4% of exacerbations¹⁴.

There is no data indicating a higher susceptibility of asthma patients to coronavirus infections or a more severe course of viral disease. Available data indicates asthma as a risk factor for SARS-CoV-2 infection – the proportion of asthmatic patients among SARS-CoV-2 infected individuals and the severity of the infection are similar to the general population^{15,16,17}.

In patients with allergic asthma, lower mRNA expression for angiotensin-converting enzyme 2 (ACE-2) was found in bronchial epithelium, which is a receptor for SARS-CoV-2¹⁸. Surface expression on respiratory epithelial cells at protein level has not yet been determined. Lower mRNA expression for ACE-2 in these patients may be associated with the presence of T2 cytokines, characteristic of allergic inflammation, especially IL-13. It has been shown that airway allergen challenge leads to a decrease in ACE-2 expression, which may reduce susceptibility to SARS-CoV-2 infection¹⁹. In the second study, no differences have been found in the expression of ACE-2 in sputum cells in an asthmatic patient compared to a healthy group; however, no allergic background of asthma was determined in it. The use of inhaled corticosteroids (ICS) may involve reduced expression of both ACE2 and TMPRSS2 serine protease²⁰.

While heart disease and metabolic diseases are often found among coronavirus-infected patients, asthma, COPD and bronchiectasis are even less frequent²¹. However, it shall

be noted that most of the data comes from Asian countries (China, South Korea) and the data on the European population is currently very scarce. The differences in COVID-19 mortality rates between Asian and European patients observed after just a few weeks of the pandemic may indicate that these populations are not only culturally and socially distinct, but may also differ in terms of genetically determined sensitivity to the severity of the disease. Due to the low prevalence of SARS-CoV-2 infection in children, there is no data on this age group as yet.

It is not known whether the SARS-CoV-2 virus causes exacerbation in asthmatic patients, and if so, what the course of the disease is. Given that coronaviruses of other strains are detected in the airways in patients with asthma exacerbations, it cannot be ruled out that SARS-CoV-2 may also cause asthma exacerbations.

In patients with allergic rhinitis (AR), a different immune response to rhinoviruses and paramyxoviruses is found in the airway epithelium²². However, at present it cannot be determined whether patients with AR are more likely to be infected with the SARS-CoV-2 coronavirus compared to the general population. The probability of infection among patients with AR may be higher in case of suboptimal treatment or discontinuation of treatment which may lead to increased itching of the eyes and nose, sneezing and nasal discharge. All these symptoms naturally force patients to have much more frequent contact of their hands with their eyes and nose, both on a reflex and conscious basis. As a result, patients with AR should, on the one hand, be encouraged to maintain treatment that provides full control of their symptoms and, on the other hand, to strictly comply with the sanitary regime.

There is no data on the SARS-CoV-2's association with or effect on food, drug or Hymenoptera venom allergies.

c. Continuation of the existing treatment as a point of departure for further procedures

Treatment of bronchial asthma

Inhaled corticosteroids (ICS) are the most effective controllers of chronic bronchial asthma and during the SARS-CoV-2 epidemic they should be used in both non-infected and infected asthmatic patients in line with the accepted standards²³. There is no indication that inhaled corticosteroids may increase susceptibility to coronavirus infections or affect their course in infected individuals. There is no evidence to suggest that ICS should be discontinued in patients already treated^{24,25}. On the contrary, experience with respiratory tract infections caused by other viruses shows that good asthma control associated with effective treatment with inhaled corticosteroids reduces the risk of exacerbations that are mostly associated with viral infections. Reduction or withdrawal of ICS may therefore result in loss of asthma control and potentially increased susceptibility to SARS-CoV-2 infection. Moreover, the loss of control may result in the patient's need to use systemic corticosteroids, visit a hospital emergency ward or be hospitalised, which may further increase the risk of infection. Optimal treatment of asthma is crucial not only for the patient themselves, but also for their environment.

Insufficient asthma control may manifest itself i.a. in more frequent coughing attacks, which, even with the asymptomatic course of COVID-19 disease in a patient with asthma, may significantly increase the risk of transmission of the infection to people in the immediate vicinity. ICS withdrawal may increase the risk of asthma exacerbation. There is no evidence to suggest that the existing recommendations for increasing the dose of ICS in case of asthma exacerbation should be changed.²⁶

1)**It is recommended to continue anti-inflammatory treatment with inhaled corticosteroids in asthmatic patients during the SARS-CoV-2 epidemic.**

2)**ICS should be administered via metered dose or dry powder inhalers.**

Procedures related to the generation of large volumes of aerosol, which include administration of nebulized drugs, provoking cough and sputum, upper respiratory tract swabbing represent an increased risk of SARS-CoV-2 transmission. In the current situation, the indications for the same should be limited. If nebulization is necessary, staff should be equipped with the protective equipment listed in item 6, including the FFP3 mask, waterproof long sleeve apron. The procedure should be implemented in an isolation room, preferably with an air exhaust system to ensure negative ventilation pressure. The number of people in the room should be kept to a minimum.

3)**The use of nebulisers is discouraged as it may cause increased aerosolisation of virus particles in the ambient air and promote the spread of infection.**

Systemic corticosteroids (SCS) are used chronically in about 5% of patients with severe bronchial asthma, but emergency oral corticosteroid bursts are often administered during disease exacerbation. In asthma patients with chronic oral corticosteroids there is no justification for interruption or reduction of doses due to threatening or present COVID-19 disease. Discontinuation of oral corticosteroid therapy in these patients could result in exacerbation of the underlying disease; in addition, the development of acute adrenal insufficiency, which could cause increased susceptibility to viral infection, cannot be excluded.

4)**It is justified to continue treatment with oral corticosteroids in patients taking these drugs on a chronic basis.**

For the time being, however, it is not possible to present an unequivocal opinion on the administration of SCS during asthma exacerbation in a COVID-19 patient. Although the World Health Organization (WHO) and the US Centre for Disease Control and Prevention (CDC) recommend avoiding oral corticosteroids in patients with COVID-19^{27, 28}, there are also reports indicating the beneficial effects of SCS on the course of SARS-CoV-2 infection in hospitalised patients²⁹. Therefore, it can be assumed that in asthma patients without

symptoms and without a confirmed SARS-CoV-2 infection, treatment with oral corticosteroids is acceptable during the exacerbation of the disease. In asthmatic patients with SARS-CoV-2 infection, the decision remains in the hands of the attending physician.

There is no data indicating that the use of other anti-asthmatic drugs (short- and long-acting beta2-adrenergic agonists or antileukotriene medications) is relevant for the course of COVID-19 disease.

Biologic therapy in the management of asthma

Anti-IgE antibodies and IL-5 neutralising agents, which are currently available in the drug programmes of the National Healthcare Fund, help to achieve and maintain disease control in patients with severe bronchial asthma. There is no data indicating possible immunosuppressive effects of anti-IgE and anti-IL-5, which could affect susceptibility to SARS-CoV-2 infection or the course of the COVID-19 disease. According to the recommendation of the Ministry of Health, biologic drugs, in the absence of alternative methods of treatment, should be administered according to the existing rules^{30,31}. Also international bodies recommend continuation of biologic treatment of asthma during the COVID-19 pandemic³².

5)**It is recommended to continue biologic therapy with anti-IgE, anti-IL-5 or anti-IL5R in patients with severe asthma.**

6)**It is acceptable to start and continue biologic therapy with anti-IgE or anti-IL-5 antibodies in patients with severe bronchial asthma in accordance with the current drug programme of the National Health Fund.**

7)**The possibility of administering a biologic drug for injection at home should be considered, which will reduce the frequency of visits to the health care centre.**

It may be justified to limit additional tests (e.g. spirometry) as provided for in the drug programme.

Allergic rhinitis

It should be noted that the symptoms of conjunctivitis – often accompanying the symptoms of allergic rhinitis (AR) – may occur in the early stages of coronavirus infection. The primary treatment of AR includes antihistamines and intranasal corticosteroids³³. There is no data that would justify limiting the use of antihistamines or local corticosteroids in patients with AR.

8)**In patients with AR, the existing therapy should be continued and adequate remedies including local anti-inflammatory treatment should be implemented in patients with expected seasonal symptoms³⁴.**

Allergic skin diseases

There is no evidence of a direct link between the presence of allergic skin diseases (atopic dermatitis, chronic urticaria, angioedema) and susceptibility to SARS-CoV-2 infection or the course of the COVID-19 disease. However, it cannot be ruled out that chronic stress associated with allergic skin diseases, which has an adverse effect on immune system function, may be conducive to such susceptibility (limitations on the use of diagnostic procedures in these diseases during the pandemic are discussed below).

Frequent washing of hands and the use of antibacterial and disinfectant preparations recommended during the pandemic increase the likelihood of weakening the natural skin barrier. It is therefore necessary to protect the skin from drying out and damaging the integrity of the epidermal barrier^{35, 36}. This applies in particular to patients with AD with a moderate to severe course of the disease.

In COVID-19 infection, no specific skin symptoms have been described so far³⁷. In the course of the disease, very diverse skin lesions are described, such as generalized erythroderma, urticaria and cutaneous manifestations of drug hypersensitivity underlain by all mechanisms of immunological response. They are usually accompanied by lymphopenia and eosinopenia³⁸.

Although there is currently no evidence of a direct link between previously diagnosed classical allergic or atopic skin diseases (e.g. atopic dermatitis, chronic or acute allergy-induced spontaneous urticaria or allergic angioedema) and susceptibility to SARS-CoV-2 infection or the course of COVID-19, it should be stressed, however, that allergic skin diseases constitute a very broad panel of diverse symptoms underlain not only by type I or IV immune reaction. There is no well documented data available on the possible impact of COVID-19 on the development and course of these diseases³⁹.

European guidelines for treatment of atopic eczema issued by the European Task Force on Atopic Dermatitis recommend the continuation of immunomodulatory therapy, including immunosuppressive therapy, as possible exacerbation of the symptoms of the underlying disease (AD) may have a significant impact on the patient's immune status.

Given the possibility of respiratory symptoms such as asthma or COPD coexisting in patients with AD, the possibility of modifying immunomodulatory therapy, including its periodic interruption, should be considered in accordance with current management guidelines for general treatment in the course of an active infection. A potential link between the severity of clinical symptoms of allergic skin diseases and chronic stress associated with the current epidemiological situation cannot be excluded. As it is known, stress has an adverse effect on the function of the immune system, lowering both the general immunity and the function of the cutaneous immune system, which may result in greater susceptibility of patients to develop symptoms of infection.

For medical personnel, the use of recommended procedures and protective equipment such as masks and goggles that adhere tightly to the skin and cause pressure on it may lead to the development of symptoms of delayed pressure urticaria⁴⁰.

9)*After application of disinfectants, especially in patients with allergic skin diseases, the epidermal barrier shall be protected by the use of adequate emollients, including barrier creams and medicinal creams.**

During the pandemic, patients with symptoms of severe chronic spontaneous urticaria, in whom the fourfold dose of modern antihistamine is ineffective, may still be eligible for biologic therapy with omalizumab, according to the current drug programme of the National Health Fund.

10)*Continuation and, in specific cases, initiation of biologic therapy with anti-IgE antibodies (omalizumab) in patients with severe chronic urticaria is acceptable.**

In the current epidemiological situation, the initiation of urticaria treatment with immunosuppressants (e.g. cyclosporine) is not recommended due to the possibility of increasing susceptibility to viral infections. If treatment with cyclosporine has already been taken, reduction to a one-half of the usual dose should be considered.

Other allergic diseases

Food and drug allergies are not directly related to COVID-19 (limitations on the use of diagnostic procedures are discussed below).

D. Allergen immunotherapy

Allergen immunotherapy (AIT) is used in the treatment of seasonal and year-round inhaled allergies and in Hymenoptera venom allergy. There is no data indicating possible adverse effects of AIT on susceptibility to or on the course of the COVID-19 disease.

Continuation of AIT

In patients with inhaled allergy, the continuation of AIT in line with the principles followed to-date (minimum 3 years) is crucial for maintaining control of the disease and ensuring the effectiveness of this procedure, carried out with great effort by the patient and the doctor. Justification for terminating the ITA before the lapse of 3 years or suspending it may be epidemiological (fear of infection during the visits) or organisational aspects (no conditions for continuing the AIT in the allergist's office). If immunotherapy is suspended, the patient

should be informed in detail about the principles and schedule for its continuation after the stabilisation of the epidemiological situation.

In confirmed cases of COVID-19, AIT (both SCIT and SLIT) should be discontinued, regardless of the severity of the disease, until the symptoms have completely disappeared and/or appropriate quarantine has been carried out. It may be beneficial to extend the injection intervals in the continuation phase. In patients who have recovered from COVID-19 or who are found to have a sufficient level of anti-SARS-CoV-2 antibodies after (asymptomatic) disease, AIT can be started or continued as planned⁴¹.

11)**In inhaled allergy patients undergoing subcutaneous immunotherapy it is justified to continue AIT for at least 3 years.**

12)**Expanding AIT injection intervals in the continuation phase should be considered.**

13)**Taking into account the epidemiological and organisational aspects, the doctor, in consultation with the patient, may consider a temporary suspension of systemic AIT with a view to its resumption under conditions of full safety.**

14)***In patients without COVID-19 symptoms, continuation of sublingual immunotherapy is recommended. Using SLIT by a patient at home is beneficial because it helps avoid contact with potentially infected people at the health care centre. The patient shall be provided with sufficient supply of preparation.**

15)**SCIT and SLIT should be discontinued in symptomatic patients after exposure or contact with persons with a positive SARS-CoV-2 result or in patients with a positive SARS-CoV-2 result (molecular tests).**

16)**It is recommended to replace SLIT wherever it is possible and will not affect the effectiveness of immunotherapy.**

Thus, a possible alternative treatment for inhaled allergies is to offer patients sublingual immunotherapy. It should be stressed that the final decision in an individual case is made by the doctor in consultation with the patient.

In the case of Hymenoptera venom allergy, continuation of venom immunotherapy (VIT) is critical to ensure the safety of the patient – it is a life-saving procedure. This justifies the continuation of VIT for 5 years, or for an unlimited period of time in patients with risk factors for failure of immunotherapy, or for 3 years in the remaining group of VIT-qualified patients.

17)**It is recommended to continue the AIT with insect venom allergens in accordance**

with current principles for 3 years or more, depending on the occurrence of risk factors for the failure of immunotherapy.

Due to the necessity to reduce social contact during the epidemic, it is justified to extend the interval between injections to the maximum period acceptable for a given vaccine: up to 4-6 weeks in the first year of vaccination and to 8 weeks in subsequent years of vaccination. In cases where it is necessary to suspend immunotherapy for epidemiological and organisational reasons, the patient should be informed in detail about the potential risks and benefits of such a decision as well as the principles and schedule for its continuation after the change in the epidemiological situation.

Initiation of AIT

18)**During the pandemic it is not recommended to start AIT with inhaled allergens.**

19)**During the pandemic it is possible to undertake the ultra-rush immunotherapy for Hymenoptera venom allergy in patients with absolute indications for such treatment.**

20)**Persons with a history of anaphylaxis should be provided with 2 packagings of adrenaline for self-administration.**

E. Implementation of other allergological procedures during the COVID-19 pandemic

In order to reduce the risk of SARS-CoV-2 infection associated with a patient's visit and stay in a medical unit during the pandemic, only the necessary diagnostic procedures that have a direct impact on the medical procedure should be pursued. We propose to adopt the categorisation presented by the AAAAI into procedures of low, medium and high SARS-CoV-2 transmission risk, leaving the decision on the necessity of their implementation to the allergist⁴².

21)**It is recommended to limit the following allergological procedures to exceptional situations, taking into account the varying risk of transmission of SARS-CoV-2 infection:**

Low risk procedures

- Skin prick tests (SPT)
- Intradermal testing
- Epidermal patch tests

Medium risk procedures

- Food allergen challenge

Drug challenge
Skin testing in young children

High risk procedures

Spirometry* (see below)
PEF measurement in office
Exhaled nitric oxide (FeNO) test
Test of non-specific bronchial hyperreactivity
Bronchial and nasal inhaled airway challenge

In particular during the SARS-CoV-2 pandemic, indications for spirometry and other functional lung tests should be limited⁴³. The patient may be recommended to monitor the peak expiratory flow rate under domestic conditions. Similarly, the implementation of other high-risk procedures should be reduced.

22)**Spirometry should be performed only in exceptional cases and in accordance with the recommendations of the European Respiratory Society⁴⁴ (Annex 1)**

24)**In case of indications for the diagnostics of IgE-dependent sensitisation, the use of *in vitro* tests for detecting the presence of specific IgE (sIgE) antibodies is recommended instead of SPT.**

25)**Drug challenge testing and tolerance tests for alternative drugs (antibiotics, NSAIDs, perioperative and topical anaesthetics) are acceptable in justified cases.**

26)**In justified cases, a desensitisation procedure may be performed (e.g. for aspirin in coronary artery disease or antineoplastic drugs).**

Rules of conduct for asthma and allergy patients during the SARS-CoV-2 pandemic

The recommendations for allergists have been published i.a. by the European Academy of Allergy and Clinical Immunology (EAACI) [41] and the American Academy of Allergy, Asthma and Immunology (AAAAI) [3]. The recommendations by the expert panel of PTA for the modification of work organisation at an allergist's office during the pandemic are presented below and in Table 2:

1. Since allergic diseases are chronic and most patients have their treatment plans at home, allergists should limit the number of office visits to the necessary minimum.

2. In most cases, consultation may/should be given to patients by phone or electronic means of communication (Skype, e-mail) – this form has a full formal justification from the National Health Fund and is accounted for as a traditional visit to the clinic.
3. A visit to the office should be considered in case of first-time patients and the suspected presence of uncontrolled symptoms despite starting interventional treatment.
4. If a visit at an allergist's office is still necessary, patients should be admitted in dedicated rooms, so as to shorten their route to the place of provision of service as much as possible and to ensure an adequate distance between those waiting for a visit (Ministry of Health).
5. Patients come to the visit by themselves (if possible) or with only 1 caregiver, with surgical masks on.
6. The safety of patients, their appointed representatives and medical staff should be ensured if a visit is necessary (in accordance with the recommendations of the Ministry of Health).
7. An allergist should use personal protective equipment (gloves, masks, aprons) according to the current guidelines of the Ministry of Health.
8. Asthmatic patients who do not have a treatment plan for the exacerbation of the disease should be provided with one via Internet or telephone (SMS).
9. Patients with seasonal allergies should be informed about the upcoming pollen season and recommended to start treatment before the expected season. It may be important to make local pollen calendars available.
10. Due to the difficulty of differentiating the exacerbation of the allergic disease from COVID-19 symptoms (e.g. conjunctival symptoms, coughing, dyspnea), the epidemiological history plays a key role in the selection of persons requiring referral for virological diagnostics and obtaining a result before the planned visit to the clinic. The use of available screening questionnaires is justified (Annex 1).

Resuming allergological practice

Though medical services other than those associated with **COVID-19** have not been formally banned, services in hospitals and outpatient clinics (including allergy clinics) have recently been reduced for reasons of patient safety. At present, health care facilities are returning to

providing services. In any case, provision of allergological services should be resumed in accordance with all precautionary and safety rules. We believe that the majority of the recommendations presented in this position statement also apply to the “defrosting” period of the allergist’s practice. Preliminary recommendations concerning return to the allergological practice were presented by AAAAI [42], but need to be adapted to local conditions.

In view of the rapidly changing epidemiological situation, the recommendations set out in this position statement will be updated as new information becomes available.

Table 1 Recommendations for patients:

- Take your medication as directed before.
- Make sure you have enough medication for the next period/season, but don’t get more than you need.
- Take rest and maintain a healthy lifestyle.
- Follow the applicable isolation/quarantine recommendations.
- To protect yourself from COVID-19 infection, keep a social distance, as recommended by the authorities. Practice good hygiene, which includes frequent washing of hands with soap and water, covering your mouth when coughing or sneezing, wear a protective mask.
- If you are short of medication, call your GP practice or specialist. If necessary, use electronic consultation.
- People in their 60s and older, with coexisting conditions such as diabetes, heart disease and lung disease, are particularly vulnerable to COVID-19. Children rarely have severe symptoms after infection, and perhaps even less frequently get ill, but this does not mean that infants, young children and teenagers are not carriers of SARS-CoV-2.
- If you feel unwell, which may be caused by COVID-19, contact your local branch of the Epidemiological Station or call the hotline (800 190 590) and follow strictly the instructions.

Table 2

Principles for the modification of work organisation at an allergist's office, including one administering SIT, during the pandemic.

	ORGANISATIONAL RECOMMENDATIONS
RECEPTION DESK	epidemiological history taken by phone (pre-qualification/disqualification), strict appointment hours (time slots), only absolutely necessary accompanying persons, extended injection intervals (SIT), prolonged working hours of the clinic, time slots and spatial separation of the admission of healthy (SIT) and ill patients
STAFF	protective clothing (apron, mask), in case of direct contact with the patient (including high-risk procedures e.g. spirometry): outer apron, gloves (change/washing/disinfection of hands), mask, visor/goggles, hair protection, separate staff rooms
PATIENT	epidemiological history, temperature measurement, hand disinfection, mask, time interval to other patients (strict regime of admission hours and keeping distance in the waiting room)
OFFICE	surface disinfection, staff and patient distance (patient chair)
WAITING ROOM	time slots and spatial separation (strict hours of admission, make other offices available, 1 place, the patient does not move around, remove some chairs), the need to keep at least 30 minutes of observation after SIT administration
VISITS	teleconsultation, personal visits in justified situations

Annexes

1. Rules for performing the spirometry test (position statement of ERS)
2. Epidemiological history

Literature

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- ⁷Recommendations of the European Centre for Disease Prevention and Control (ECDC):
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- ⁸Recommendations of the National Consultant for Communicable Diseases:
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Annex 1

European Respiratory Society (ERS) recommendations for health professionals performing functional testing of the respiratory system during the COVID-19 pandemic

Coronavirus is mainly transmitted via droplets. During lung function tests, virus transmission may occur through respiratory secretions. Therefore, additional precautions for the performance of the test are recommended. They depend on the current epidemiological situation.

Recommendations for the pandemic phase – level 1 security

In the pandemic phase, personnel safety and the possibility of contamination of diagnostic equipment must be considered. Therefore, it is recommended to limit the referral for spirometry testing to patients requiring an urgent examination only for the purpose of an urgent disease diagnosis.

The test is currently not recommended for patients with COVID-19 or flu-like symptoms. All scheduled tests should be postponed. Patients with confirmed COVID-19 should not be tested for at least 30 days following infection.

Respiratory testing may be resumed in case of low risk of SARS-CoV-2 infection and after a reliable assessment of the risk of infection in the patient based on the evaluation of symptoms together with the results of reliable and easily accessible tests.

Recommendations for conduct in specific areas:

Test organisation

- *the patient should only be referred to the test if it is absolutely necessary;
- *before performing the test, the patient should be evaluated for their current COVID-19-related status;
- *the places where the patients are waiting for the test should be properly prepared. In the waiting room, patients should wear face masks and sit at least 2 meters apart or according to local guidelines. Only the patient should participate in the test and, if necessary, they may be accompanied by one person (parent, caregiver);
- *respiratory test rooms and other offices should be reorganised so as to minimise virus transmission;
- *the following additional time should be taken into account when scheduling the respiratory test: procedure for cleaning/disinfection of the equipment surface and environment, ventilation of the room for at least 15 minutes (open windows, closed doors), recalibration of the equipment after decontamination and exchange of personal protective equipment. The additional time needed may be between 30 and 60 minutes;
- *additional stand-by staff should be available to assist the personnel in carrying out procedures;

Measurements and measuring equipment

- *the tests should be limited to spirometry and lung diffusion test, other tests should be preceded by a risk assessment;

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- *the test should always be carried out using a high-performance disposable built-in antimicrobial and antiviral filter (we recommend filters with a minimum proven performance for a high expiratory flow of 600 to 700 l/min). The use of disposable mouthpieces/sensors is currently not recommended unless they can be equipped with additional filters that do not affect the evaluation of respiratory parameters;
 - *use as many disposable materials as possible. They should be carefully disposed of, e.g. nose clips, rubber mouthpieces etc.;
 - *if reusable items are used, they must be carefully managed and thoroughly cleaned in accordance with sanitary rules;
 - *exercise testing, nebulisations, challenge testing and other aerosol generation procedures are not recommended;
 - *for high-risk patients, consideration should be given to the use of telemedicine for remote patient respiratory testing with video instruction in real time by trained personnel;

Protection of personnel carrying out respiratory tests

- *it is essential that medical personnel use personal protective equipment in all situations. The test personnel should be in one room; they may leave the room after doffing their personal protective equipment
- *FFP3 or FFP2 masks are recommended. The duration of use of protective masks should be in accordance with the recommendations. Always protect your eyes e.g. with goggles or a face shield;
- *always use disposable gloves when performing the test. They shall be discarded after each test and after cleaning the surrounding surface;
- *after performing the test and removing the protective gloves, proper hand hygiene must be maintained;

Cleaning and control

- *all patients who undergo respiratory testing should wear protective masks on their faces;
- *the developed equipment cleaning procedures must be regularly updated and strictly adhered to;
- *adequate ventilation should be provided in the test room (vacuum ventilation in the test room, if available); HEPA filters are NOT recommended (viral colonisation);
- *UV lamps or ozone shall be used to disinfect the room at intervals in accordance with the local sanitary inspection policy;
- *health safety procedures should be implemented in accordance with local rules;

Recommendations for the post-peak phase – level 2 security

In this phase of the epidemic, the probability of infection prior to taking the test is lower than in the pandemic phase. However, this phase still requires significant security measures. Therefore, basic infection control procedures and organisational recommendations should remain the same as in case of level 1.

In the post-peak phase it is recommended:

Testing and equipment

- *all test procedures can be restored with additional precautions (full protective equipment and appropriate mask according to local rules, e.g. FFP3 or FFP2);
- *exercise testing, nebulisations, bronchial challenge tests and other aerosol generating procedures (e.g. methacholine challenge) should be restricted to specific equipment and rooms;
- *when using nebulisers, filters should be used to minimise the escape of aerosol from the exhalation ports;
- *using filters connected to the inhalation/exhalation port of the face mask or mouthpiece during an exercise test can reduce aerosol transmission. This may result in an increase in airflow resistance as the need for ventilation increases during exercise (filter humidification and increased resistance at increased ventilation flow), making the results of exercise tests less reliable, especially in patients with dyspnea. This aspect requires a consensus to be reached;

Recommendations for the post-pandemic phase – level 3 security

The pre-COVID-19 standards for the provision of lung function testing services based on local recommendations and conditions should be reinstated.

Annex 2

EPIDEMIOLOGICAL HISTORY

Full name.....

Date.....

1. Do you have any symptoms of infection, such as rhinitis, coughing, weakness, fever?

YES NO

2. Have the above mentioned symptoms of infection occurred in the last 2 weeks in one of your household members?

YES NO

3. Have you or any of your household members been abroad in the last 2 weeks?

YES NO

4. Are you or anyone in your household currently under epidemiological surveillance (quarantine)?

YES NO

5. Have you had contact with a person with a confirmed coronavirus infection in the last 2 weeks?

YES NO

.....
Patient's signature

Temperature measurement:.....