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The guidelines highlight the need to reconsider exposures in cases with unclear diagnosis.

The committee suggests performing serum IgG testing that targets potential antigens for both non-fibrotic and fibrotic hypersensitivity pneumonitis. It should be noted, however, that this suggestion has a very low confidence in the estimated effects. First, positivity means sensitisation and does not prove causality. Second, there is no standardised hypersensitivity pneumonitis panel. Given the high variability in the type of inciting agents across different geographical areas, it is extremely difficult, if not impossible, to have such a panel with global applicability.

BAL lymphocytosis is recognised as an important element in the diagnosis of hypersensitivity pneumonitis. The exact threshold of BAL lymphocytosis favouring a hypersensitivity pneumonitis diagnosis is not defined and indeed it is difficult to do so. However, the degree of BAL lymphocytosis alone plays an important role in defining clinical probability. For example, in a patient with documented exposure and compatible HRCT pattern for hypersensitivity pneumonitis, a BAL lymphocytosis of 40% can drastically alter the degree of diagnostic confidence comparing to a BAL lymphocytosis of 20%. Yet, if one follows the guidelines to the letter, there is moderate confidence in diagnosing hypersensitivity pneumonitis for both cases.

Another crucial point is the role of biopsy in the diagnostic procedure. According to the guidelines, the only way to achieve a definite diagnosis is by means of histopathology, but this conclusion should not lead to an overuse of biopsies. In clinical practice the goal is not to reach a definite diagnosis at any cost but to achieve a working diagnosis with a sufficient degree of likelihood that allows the commencement of therapy, while minimising the potential risk of diagnostic interventions. The ontological framework proposed by Ryerson and

colleagues based on diagnostic probability can be of value. It includes a definite diagnosis (likelihood $\geq 90\%$), a high confidence provisional diagnosis (likelihood 70–89%), a low confidence provisional diagnosis (likelihood 51–69%), and unclassifiable disease. Physicians primarily function by assigning patients to discrete categories. It is vital, especially in the field of ILDs, to develop a probability-oriented way of thinking, as Jerome Kassirer emphasised 30 years ago. Finally, given the results of the INBUILD study, in the case of a progressing fibrotic lung disease, the added information of a biopsy is unlikely to influence treatment. That does not devalue the importance of accurate diagnosis because it is an integral part of individualised medicine.

In conclusion, the recently published guidelines for the diagnosis of hypersensitivity pneumonitis in adults represent a pivotal evolution in the field of ILDs. For the first time, a common language can be used in the diagnosis of hypersensitivity pneumonitis. The homogeneity provided by the guidelines allows the design and completion of randomised controlled trials in homogenised cohorts, which can impact the development of new therapeutic approaches. However, it is important to have a certain degree of clinical flexibility. It is interesting to note the evolution of the guidelines for IPF that have shifted from being clinical trial oriented in 2011 to clinical practice oriented in 2018. We expect the same to happen with hypersensitivity pneumonitis. The wealth of new information that will arise from research based on these guidelines is expected to provide considerable progress and new knowledge in the field of genetics, pathophysiology, diagnosis, and subsequently management.

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COVID-19 and preschool wheeze care: lessons learned

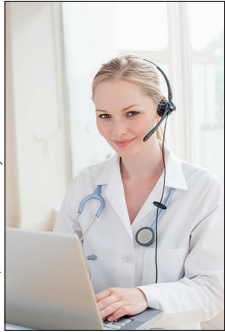
The pattern of increasing visits to the emergency department by children younger than 5 years with preschool wheeze and other respiratory conditions has been disrupted by the COVID-19 pandemic. Since March, 2020, presentations to the emergency department have decreased among children of all age groups, especially infants and preschool children who are the most frequent attenders. This notable change in asthma exacerbations in children has raised research interest into how the COVID-19 pandemic has contributed to this change, and what lessons can be learned. Risks of harm due to delayed medical assessment or treatment were flagged early in the

pandemic but are still unclear; empirical UK data to date have been conflicting, with one prospective multicentre study suggesting that the number of “inappropriately delayed hospital presentations” was low, but another survey of paediatricians reported more widespread evidence of delay. The sudden changes to health-care seeking behaviour and health-care delivery offers a rare opportunity to redesign and improve health care for children with preschool wheeze to allow for better outcomes in the future.

We have previously argued the need for a joined-up strategy to improve outcomes of children with preschool wheeze and this need is reinforced by lessons from the



Published Online
August 4, 2020
[https://doi.org/10.1016/S2213-2600\(20\)30351-9](https://doi.org/10.1016/S2213-2600(20)30351-9)



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For more on **attendances at emergency departments in England** see *Emerg Med J* 2020; published online April 16. DOI:10.1136/emmermed-2018-208189

For **data on emergency department presentations** see <https://www.england.nhs.uk/statistics/statistical-work-areas/ae-waiting-times-and-activity/>

For more on **children's emergency presentations during the COVID-19 pandemic** see **Correspondence**

Lancet Child Adolesc Health 2020; published online June 26. [https://doi.org/10.1016/S2352-4642\(20\)30206-6](https://doi.org/10.1016/S2352-4642(20)30206-6)

For more on **asthma in children during the COVID-19 pandemic** see **Comment** *Lancet Respir Med* 2020; published online June 25. [https://doi.org/10.1016/S2213-2600\(20\)30278-2](https://doi.org/10.1016/S2213-2600(20)30278-2)

For **survey data** see *Arch Dis Childhood* 2020; published online June 25. DOI:10.1136/archdischild-2020-319848

For more on **understanding and improving quality of care in preschool wheeze** see **Spotlight** *Lancet Respir Med* 2020; **8**: 144–45

For a **study on respiratory infections during childhood** see *Am J Respir Crit Care Med* 2018; **197**: 1265–74

For more on **expression of ACE2** see *J Allergy Clin Immunol* 2020; **146**: 203–06

For more on **wheeze in preschool children** see *BMJ* 2014; **348**: g15

For more on **passive smoke exposure and incidence of asthma and wheeze** see *Pediatrics* 2012; **129**: 735–44

For more on **passive smoke exposure and childhood asthma** see *J Environ Health Sci* 2016; **2**: 1–5

COVID-19. Three important areas to consider include measures to reduce the incidence of wheeze attacks (viral triggers, environmental pollution, direct and second-hand smoke); improved accessibility of health-care pathways; and the provision of the right advice at the right time, enhancing parental knowledge and confidence to manage the condition successfully.

80–90% of preschool wheeze attacks are triggered by respiratory viruses. Most epidemiological studies report coronaviruses as co-infections rather than sole infective agents. The reduced number of wheeze attacks triggered by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) could be partially explained by low expression of ACE2 receptor in atopic asthmatic children, as described in the Urban Environment and Childhood Asthma cohort. However, atopic children represent a small group of preschool children with wheeze.

Other factors could be driving the decrease in wheeze presentations to the emergency department. Tobacco smoking and exposure to second-hand smoke are considered as causative factors for childhood asthma, affecting millions of children around the world. Exposure to prenatal or postnatal passive smoke has been associated with a 30–70% increased risk of incidence of wheezing and a 21–85% increase in incidence of asthma. Increases in allergen levels associated with indoor tobacco exposure could potentially trigger airway hyper-reactivity underlying a wheeze attack. During the COVID-19 pandemic, the public health message was to avoid smoking because it was considered a risk factor for severe COVID-19 disease. A suspected decrease in smoking could have positively contributed to the decreased incidence of wheeze attacks. Although the data are inconclusive, recent evidence suggests a small increase in the use of an anti-smoking app in the UK since 2019. A favourable effect of lockdown measures on reduction of environmental pollution could be another factor contributing to the lower incidence of wheeze attacks.

In the medium term, a focus on reducing exposure to wheeze triggers could have huge impact. Options range from stricter air pollution laws, more handwashing in schools, more vaccination against respiratory viruses associated with wheeze attacks in children, more antivirals in the management of virus-induced wheeze attacks, and a better understanding of how we can use respiratory virus testing in the clinical care pathway (to estimate the risk of recurrent wheeze attacks).

Telemedicine has been an effective tool for health-care delivery during the pandemic, offering caregivers the chance to receive care for their children in the comfort of their own home. Although digital tools have been available for years, they have rarely been used in routine care in the UK. The urgent need for establishment of remote patient care led to the rapid commissioning of

these tools. The question is how adoption of these tools in clinical care might change outcomes in preschool wheeze. If telemedicine is to be the future of health-care service provision for preschool children with recurrent wheeze, then this must be a safe and equally accessible tool. Accessibility to professional advice is often easier through digital pathways, but it is not clear yet what is the level of technological literacy of the wider population of caregivers. Since 2016, UNESCO has placed digital platforms at the heart of education throughout the world. However, many groups do not have access due to insufficient skills or internet access, for example. These groups must not be deprived of health-care access and relevant medical knowledge. Furthermore, health-care professionals who provide virtual care and give advice on acute management need to be technologically skilled. Assessing the severity of an acute wheeze attack might not be safely performed through a screen. During the COVID-19 pandemic, there was scepticism around the use of existing scores (eg, Roth Score) to assess severity of dyspnoea in adults during primary care consultations. COVID-19-associated hypoxaemia during acute presentation was considered to be out of proportion to dyspnoea, complicating remote acute assessment of patients. Any acute assessment of wheeze severity, when performed remotely, needs to be followed by safety-netting advice and education of caregivers' in how to recognise signs of deterioration. These strategies have been shown to reduce risk but rely on the caregivers' ability to make an assessment for which they are often unprepared, at a time when they feel frightened for their child's safety. Tools, such as smartphone apps could help provide more accurate assessment of vital signs by caregivers.

We believe that to make telemedicine a safe and accessible future for health-care service delivery in recurrent preschool wheeze, a renewed focus on parental education and partnership working between caregivers and physicians is needed. One tool that can enhance such partnerships is a patient reported outcome measure (PROM) that provides the caregivers' perspective of how well preschool wheeze is controlled and the impact of the condition on family quality of life. These tools, when available in digital form, can assess response to preventive treatment and can identify those preschool children with wheeze who need to be reviewed earlier or require further interventions. Crucially they encourage parents to assess their child's symptoms regularly when the child is well, providing opportunities to build and practice the skills that are needed when the child has a wheeze attack.

PROMS can also encourage an integrated approach to care by supporting earlier identification in primary care of children who would benefit from specialist review;

in turn, following specialist review, PROMS can support primary care physicians to continue to take a lead role in the care of the child. Without specific tools, such as PROMS, telemedicine might otherwise restrain discussion between physicians and caregivers about important factors other than clinical symptoms. Key topics addressed in PROMS include understanding care plans, navigation of the new digital health-care system, and discussion of concerns around returning to school. PROMS can, therefore, help ensure gaps in communication during virtual clinic appointments are mitigated.

Furthermore, PROMS can help to identify and address barriers to optimal use of preventive medication by caregivers, to allow for understanding of the importance of regular use of control medication and effective administration of inhalers to their children. A prospective study showed that caregivers' adherence to prescribed inhaled steroids as a regular medication is low. One possible reason for fewer children attending hospital with preschool wheeze during lockdown is that caregivers are spending more time at home, enabling increased support for their children. Additionally, caregivers might have maintained strict adherence to medication during lockdown because hospital visits were discouraged unless essential, leading to a reduction in wheeze attacks. In one study, caregivers stressed their need to be educated around safely assessing their child's severity of presentation.

Alongside PROMS, patient reported experience measures (PREMS) can assess and improve quality of care. Routinely asking caregivers of preschool children with

wheeze to feedback about the care their children receive will help clinicians understand whether digital preschool management works for all and to identify areas for improvement in delivery of care.

The COVID-19 pandemic experience highlights that large reductions in hospital activity for preschool wheeze are possible. The transition to delivering more remote care for children with preschool wheeze offers opportunities for rapid, convenient care. Potential risks have been identified, particularly in acute assessment and management of sick children, but these risks can be mitigated through a greater focus on education and partnership working with caregivers when their children are well. PROMS and PREMS have a key part in building these partnerships with parents, grounded in greater focus on their needs, which could transform outcomes as well as safety, efficiency, and experience of services in the future.

We declare no competing interests. DH is supported by the National Institute for Health Research (NIHR) Applied Research Collaboration North West London. The views expressed in this publication are those of the author(s) and not necessarily those of the NHS, the NIHR, or the Department of Health and Social Care.

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For more on a **smoking cessation app** see *JMIR Mhealth Uhealth* 2020; **8**: e19494

For more on **telemedicine for COVID-19** see *BMJ* 2020; **368**: m998

For more on **UNESCO digital platforms** see <https://unesdoc.unesco.org/ark:/48223/pf0000246003.locale=en>

For more on **PROMS in preschool wheeze** see *Arch Dis Child Educ Pract Ed* 2020; **105**: 185-88

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For the **study on PREMS** see *J Patient Rep Outcomes* 2020; **4**: 5

Patient perspectives

Patient support groups are a lifeline for those with idiopathic pulmonary fibrosis

After living in Austria for a long time, in 2003, I moved back to the UK and stayed temporarily with my parents. My mum had been diagnosed with dementia and I became her main carer (my dad passed away in 2004). As her health deteriorated, it became a full-time occupation and I was barely able to go out and as a result was not walking anywhere, always taking the car, even for short journeys. In 2012, I visited the castle at Tintagel (Cornwall, UK), which has an extremely steep climb up to the ancient ruin. By the time I reached the top I could hardly breathe. I thought it was just me needing to exercise more, being very unfit, and thought little more about it.

In February 2014, my daughter convinced me to go and see my general practitioner (GP) about a persistent cough

I'd had for some time. I was, in fact, more worried about my bad indigestion and heartburn than my cough because my father had died from oesophageal cancer, with his main symptom being indigestion. My GP believed my heartburn was due to acid reflux, and prescribed tablets and asked me to return if the cough persisted after a couple of weeks—my heartburn cleared, but my cough was no better.

On my return visit to the GP, he listened to my chest and heard some crackles and thus referred me to a respiratory consultant and for a CT scan. During my follow-up appointment at Torbay Hospital (Torquay, UK), a consultant informed me that I could have idiopathic pulmonary fibrosis (IPF). I had never heard of the disease so had no idea what to expect. I was given several leaflets



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Published Online
February 11, 2020
[https://doi.org/10.1016/S2213-2600\(20\)30067-9](https://doi.org/10.1016/S2213-2600(20)30067-9)

For **Singing and Breathing** see www.singingandbreathing.co.uk

For the **Action for Pulmonary Fibrosis charity** see <https://www.actionpulmonaryfibrosis.org/>