



# PRACTICE

## 10-MINUTE CONSULTATION

# Assessment and management of adults with asthma during the covid-19 pandemic

Thomas Beaney *academic clinical fellow in primary care*<sup>1</sup>, David Salman *academic clinical fellow in primary care*<sup>1</sup>, Tahseen Samee *specialist registrar in emergency medicine*<sup>2</sup>, Vincent Mak *consultant in respiratory community integrated care*<sup>3</sup>

<sup>1</sup>Department of Primary Care and Public Health, Imperial College London, London, UK; <sup>2</sup>Barts Health NHS Trust, London, UK; <sup>3</sup>Imperial College Healthcare NHS Trust, London, UK

### What you need to know

- In patients with pre-existing asthma, a thorough history and structured review can help distinguish an asthma exacerbation from covid-19 and guide management
- In those with symptoms of acute asthma, corticosteroids can and should be used if indicated and not withheld on the basis of suspected covid-19 as a trigger
- Assessment can be carried out remotely, ideally via video, but have a low threshold for face-to-face assessment, according to local arrangements

*A 35 year old man contacts his general practice reporting a dry cough and increased shortness of breath for the past three days. He has a history of asthma, for which he uses an inhaled corticosteroid twice daily and is now using his salbutamol four times a day. Because of the covid-19 outbreak, he is booked in for a telephone consultation with a general practitioner that morning.*

Asthma is a condition commonly encountered in primary care, with over five million people in the UK prescribed active treatment.<sup>1</sup> While seemingly a routine part of general practice, asthma assessment is a particular challenge in the context of the covid-19 pandemic, given the overlap in respiratory symptoms between the two conditions and the need to minimise face-to-face assessment. Over 1400 people died from asthma in 2018 in England and Wales,<sup>2</sup> while analyses of non-covid-19 deaths during the covid-19 outbreak have shown an increase in deaths due to asthma,<sup>31</sup> highlighting the need to distinguish the symptoms of acute asthma from those of covid-19 and manage them accordingly.

This article outlines how to assess and manage adults with exacerbations of asthma in the context of the covid-19 outbreak (box 1). We focus on the features differentiating acute asthma

from covid-19, the challenges of remote assessment, and the importance of corticosteroids in patients with an asthma exacerbation.

### Box 1: Asthma and covid-19: what does the evidence tell us?

#### Are patients with asthma at higher risk from covid-19?

Some studies, mostly from China, found lower than expected numbers of patients with asthma admitted to hospital, suggesting they are not at increased risk of developing severe covid-19.<sup>3-5</sup> However, these reports should be viewed cautiously, as confounding by demographic, behavioural, or lifestyle factors may explain the lower than expected numbers. Recent pre-print data from the UK suggest that patients with asthma, and particularly severe asthma, are at higher risk of in-hospital mortality from covid-19.<sup>6</sup> In the absence of more conclusive evidence to indicate otherwise, those with asthma, particularly severe asthma, should be regarded as at higher risk of developing complications from covid-19.<sup>7</sup>

#### Can SARS-CoV-2 virus cause asthma exacerbations?

Some mild seasonal coronaviruses are associated with exacerbations of asthma, but the coronaviruses causing the SARS and MERS outbreaks were not found to be.<sup>8,9</sup> In the case of SARS-CoV-2 virus, causing covid-19, data from hospitalised patients in China did not report symptoms of bronchospasm such as wheeze, but the number of patients with pre-existing asthma was not reported.<sup>10</sup> More recent pre-print data from hospitalised patients in the UK identified wheeze in a minority of patients with Covid-19.<sup>11</sup> Given the overlap of symptoms, such as cough and shortness of breath, until further published data emerges, SARS-CoV-2 may be considered as a possible viral trigger in patients with an asthma attack.

## What you should cover

### Challenges of remote consultations

Primary care services have moved towards telephone triage and remote care wherever possible to minimise the risk of covid-19 transmission. This brings challenges to assessment as visual cues are missing, and, unless the patient has their own equipment, tests involving objective measurement, such as oxygen saturation and peak expiratory flow, are not possible. In mild cases, assessment via telephone may be adequate, but,

whenever possible, we recommend augmenting the consultation with video for additional visual cues and examination.<sup>12</sup>

However, many patients, particularly the elderly, may not have a phone with video capability. If you are relying on telephone consultation alone, a lower threshold may be needed for face-to-face assessment.

## Presenting symptoms

Start by asking the patient to describe their symptoms in their own words. Note whether they sound breathless or struggle to complete sentences and, if so, determine whether immediate action is required. If not, explore what has changed, and why the patient has called now. The three questions recommended by the Royal College of Physicians—asking about impact on sleep, daytime symptoms, and impact on activity—are a useful screening tool for uncontrolled asthma.<sup>13</sup> Alternative validated scores, such as the Asthma Control Questionnaire and Asthma Control Test, which include reliever use, are also recommended.<sup>14</sup> In assessing breathlessness, the NHS 111 symptom checker contains three questions—the answers may arise organically from the consultation, but are a useful aide memoire:

1. Are you so breathless that you are unable to speak more than a few words?
2. Are you breathing harder or faster than usual when doing nothing at all?
3. Are you so ill that you've stopped doing all of your usual daily activities?

Consider whether an exacerbation of asthma or covid-19 is more likely. Both can present with cough and breathlessness, but specific features may indicate one over the other (see [box 2](#)).

Do the patient's current symptoms feel like an asthma attack they have had before? Do symptoms improve with their reliever inhaler? Do they also have symptoms of allergic rhinitis? Pollen may be a trigger for some people with asthma during hay fever season.

### Box 2: History and examination features helping distinguish asthma exacerbation from covid-19<sup>10 11 14-16</sup>

#### Exacerbation of asthma\*

##### History:

- Wheeze
- Improvement in symptoms with reliever inhaler
- Diurnal variation
- Absence of fever
- Coexisting hay fever symptoms

##### Examination:

- Wheeze
- Reduced peak expiratory flow

#### Covid-19

##### History:

- Close contact of known or suspected case
- Fever
- Dry continuous cough
- Onset of dyspnoea 4-8 days into illness
- Flu-like symptoms including fatigue, myalgia, headache
- Symptoms not relieved by inhaler

##### Examination:

- Absence of wheeze
- Peak expiratory flow may be normal

\*Note SARS-CoV-2 infection may be a trigger for an asthma exacerbation

## Risk factors and medications

To assess the risk of deterioration, ask specifically about any previous hospital admissions for asthma and about oral corticosteroid use over the past 12 months. Does the patient have any other high risk conditions or are they taking immunosuppressive drugs? Ask the patient if they smoke and take the opportunity to offer support to quit.

Are they prescribed an inhaled corticosteroid (ICS) or a long acting  $\beta$  agonist (LABA) and ICS combination inhaler? Are they using this regularly? Are they using a spacer device, and do they have a personal asthma action plan to guide management?

## Psychosocial factors

Taking a psychosocial history can be more challenging over the telephone, where cues are harder to spot. Lessons from asthma deaths have shown that adverse psychosocial factors are strongly associated with mortality.<sup>14 17</sup> These include a history of mental health problems, lack of engagement with healthcare services, and alcohol or drug misuse, along with employment and income problems. Social isolation is also a risk factor, which may be exacerbated during social distancing measures.<sup>17</sup> The covid-19 outbreak is an anxious time for many patients, and symptoms of anxiety can contribute to the overall presentation.

## Examination

In remote assessment, video can help guide decision making, and we recommend its use in asthmatic patients presenting with acute symptoms. First, assess the general appearance of the patient. A fatigued patient sitting up in bed, visibly breathless, and anchoring their chest will raise immediate concerns, as opposed to someone who is walking around while talking. Vocal tone and behaviour may indicate any contributing anxiety. Observe if the patient can speak in complete sentences, listen for audible wheeze, and count the respiratory rate. Assess the work of breathing, including the use of accessory muscles, and consider the use of a chaperone where appropriate. The Roth score is not advocated for assessment of covid-19 or asthma.<sup>18</sup>

Further objective assessment can be made, such as measuring peak expiratory flow (PEF). If the patient does not have a PEF device at home, one can be prescribed, though this may not be feasible in an acute scenario. We recommend that PEF technique be witnessed via video to assess reliability. Silent hypoxia may be a feature of covid-19, and oxygen saturations should be measured if this is a concern.<sup>19</sup> In some regions, oxygen saturation probe delivery services are being implemented, which may facilitate this. Heart rate can also be provided by the patient if they use conventional "wearable" technology, although, given the potential inaccuracies with different devices, the results should not be relied on.<sup>20</sup> If time allows, inhaler technique can also be checked.

## What you should do

### Determine the most likely diagnosis

Decide on the most likely diagnosis on the basis of the history and clinical features (see [box 2](#) and [fig 1](#)) or consider whether an alternative or coexisting diagnosis is likely, such as a bacterial pneumonia or pulmonary embolus. If you suspect covid-19 without asthmatic features, manage the patient as per local covid-19 guidance.

## Determine severity and decide if face-to-face assessment is necessary

If asthmatic features are predominant, determine severity and treat according to Scottish Intercollegiate Guidelines Network (SIGN) and British Thoracic Society (BTS) guidance (fig 1).<sup>14</sup> If the patient cannot complete sentences or has a respiratory rate  $\geq 25$  breaths/min, treat the case as severe or life threatening asthma and organise emergency admission. A peak expiratory flow (PEF)  $< 50\%$  of best or predicted or a heart rate  $\geq 110$  beats/min also indicate severe or life threatening asthma. If the patient does not meet these criteria, treat as a moderate asthma attack—a PEF of 50–75% of best or predicted helps confirm this. If they do not have a PEF meter, or if you are unsure as to severity, brief face-to-face assessment to auscultate for wheeze and assess oxygen saturations can help confirm the degree of severity and determine if the patient may be suitable for treatment at home with follow-up. Do not rely solely on objective tests and use clinical judgment to decide on the need for face-to-face assessment, based on knowledge of the patient, risk factors, and any adverse psychosocial circumstances.

Wheeze has been reported as a presenting symptom in a minority of patients with confirmed covid-19, and it may be difficult to rule out the presence of SARS-CoV-2 via remote assessment.<sup>11</sup> We recommend that, when a face-to-face assessment is needed, it should take place via local pathways in place to safely assess patients with suspected or possible covid-19—for example, at a local “hot” clinic. At present, performing a peak flow test is not considered to be an aerosol generating procedure, but the cough it may produce could be, so individual risk assessment is advised.<sup>21</sup> Consider performing PEF in an open space or remotely in another room via video link. Any PEF meter should be single-patient use only and can be given to the patient for future use.

## Initial management when face-to-face assessment is not required

For moderate asthma exacerbations, advise up to 10 puffs of a short acting  $\beta$  agonist (SABA) inhaler via a spacer, administered one puff at a time. There is no evidence that nebulisers are more effective: 4–6 puffs of salbutamol via a spacer is as effective as 2.5 mg via a nebuliser.<sup>22</sup> Alternatively, if the patient takes a combined inhaled corticosteroid and long acting  $\beta$  agonist (LABA) preparation, then maintenance and reliever therapy (MART) can be used according to their action plan.<sup>14</sup> Management of an acute exacerbation should not rely solely on SABA monotherapy, so advise patients to follow their personal asthma action plan and continue corticosteroid treatment (or start it if they were not taking it previously) unless advised otherwise (box 3). Antibiotics are not routinely recommended in asthma exacerbations.

### Box 3: Risks and benefits of inhaled and oral corticosteroids in asthma and covid-19

There is substantial evidence for the benefits of steroids in asthma. Regular use of inhaled steroids reduces severe exacerbations of asthma<sup>23</sup> and the need for bronchodilators,<sup>24</sup> while the prompt use of systemic corticosteroids during an exacerbation reduces the need for hospital admissions, use of  $\beta$  agonists,<sup>25</sup> and relapses.<sup>26</sup>

The evidence for corticosteroid use in early covid-19 is still emerging. A systematic review of steroid use in SARS reported on 29 studies, 25 of which were inconclusive and four of which suggested possible harm (diabetes, osteoporosis, and avascular necrosis) but no reported effects on mortality.<sup>27</sup> WHO have cautioned against the use of systemic corticosteroids for the treatment of covid-19 unless indicated for other diseases.<sup>28</sup>

In light of the strong evidence of benefits in patients with asthma, inhaled and oral corticosteroids should be prescribed if indicated in patients with symptoms of bronchoconstriction. Steroids should not be withheld on the theoretical risk of covid-19 infection, in line with guidance from the Primary Care Respiratory Society (PCRS), British Thoracic Society (BTS), and Global Initiative for Asthma (GINA).<sup>15 22 29</sup>

Response to initial SABA or MART treatment can be assessed with a follow-up call at 20 minutes. If there is no improvement, further treatment may be necessary at a local hot clinic for reviewing possible covid-19, emergency department, or direct admission to an acute medical or respiratory unit depending on local pathways. For those who do respond, BTS-SIGN and GINA advise starting oral corticosteroids in patients presenting with an acute asthma exacerbation (such as prednisolone 40–50 mg for 5–7 days).<sup>14 15</sup> There is an increasing move in personalised asthma action plans to early quadrupling of the inhaled corticosteroid dose in patients with deteriorating control for up to 14 days to reduce the risk of severe exacerbations and the need for oral steroids.<sup>15 30</sup> However, there may be a ceiling effect on those who are already on a high dose of inhaled corticosteroid (see BTS table<sup>14</sup>), so quadrupling the dose may not be effective in this group of patients. A personalised asthma action plan is an extremely helpful guide to treatment and should be completed or updated for all patients.

## Follow-up and safety-netting

We recommend that all patients with moderate symptoms are followed up via remote assessment within 24 hours. Asthma attacks requiring hospital admission tend to develop relatively slowly over 6–48 hours.<sup>14</sup> However, deterioration can be more rapid, and symptoms can worsen overnight. Patients should be advised to look out for any worsening breathing or wheeze, lack of response to their inhalers, or worsening PEF. They should receive clear advice on what to do, including use of their reliever, and who to contact (such as the local out-of-hours GP provider, 111, or 999). With potential long waits for remote assessment, particularly out of hours, they should be advised to have a low threshold to call 999 if their symptoms deteriorate. If covid-19 infection is also suspected, advise them to isolate for seven days from onset of symptoms and arrange testing, according to the latest guidance.<sup>7</sup>

### How this article was created

We performed a literature search using Ovid, Medline, and Global Health databases using the search terms (asthma OR lung disease OR respiratory disease) AND (coronavirus OR covid-19). Articles from 2019–20 were screened. We also searched for specific guidelines, including NICE, British Thoracic Society, Scottish Intercollegiate Guidelines Network, Primary Care Respiratory Society, European Respiratory Society, International Primary Care Respiratory Group, Global Initiative for Asthma, and the American Academy of Allergy, Asthma and Immunology.

**Education into practice**

- Do you feel confident in completing personalised asthma plans in collaboration with patients?
- How often do you start or increase inhaled corticosteroids in patients at initial presentation with an exacerbation of asthma?
- If you manage a patient with acute asthma remotely, what safety netting advice would you give and how could you check understanding?

**How patients were involved in the creation of this article**

No patients were involved in the creation of this article.

Contributors: TB and TS conceived the article. TB, DS, and TS carried out the literature review and wrote the initial drafts. All four authors contributed to editing and revision, and VM provided expert advice as a respiratory specialist. All authors are guarantors of the work.

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Figure

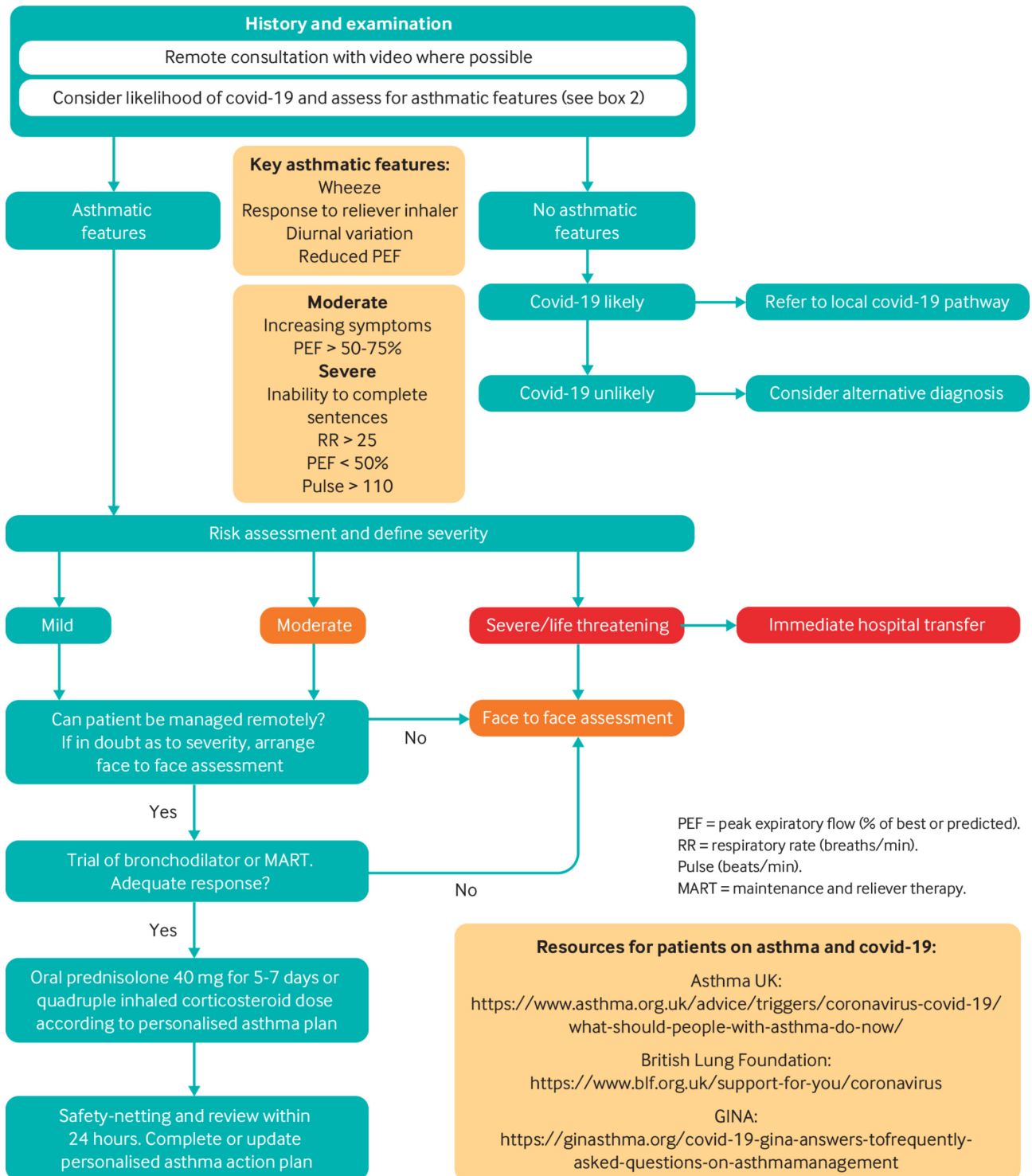


Fig 1 Assessment and management of patients with known asthma during the covid-19 outbreak<sup>14</sup>