

All that coughs is not COVID.

Read this once and be ready for people that you see with cough, fever and breathlessness

Some history

Apologies that we have adapted the Shakespearian quote but in Shakespeare's Merchant of Venice in 1596 it was suggested that "all that glitters is not gold" (1) this was a period 200 years after Europe, Asia and Africa were ravaged by a significant infectious disease caused by Yersinia Pestis (2) that we recognise as the Black Death, which is estimated to have caused 75 – 200 million deaths worldwide over a four year period(3). We are currently in all of our memories in a period where social isolation and shielding is a way of life that none of us have previously experienced. This is probably one of the most challenging periods that front line clinicians have worked in over the last 100 years or more – and we need to be thinking carefully and clearly in new situations.

Is it COVID or pneumonia or both?

What do we know?

- Pneumonia is..” diagnosed in 5–12% of adults who present to GPs with symptoms of lower respiratory tract infection, and 22–42% of these are admitted to hospital, where the mortality rate is between 5% and 14%. (4)
- (Commonest reason for hospital admission is pneumonia / lower respiratory infections, with heart problems, digestive and then COPD following some way behind in “normal times”) (NHS Information relating to 2017-2018)
- Although the traditional NICE Pneumonia guidelines suggest use of CRB65 in primary care as part of the assessment (along with routine examination and history) (Figure 1)

Figure 1: CRB65 score

“CRB65 score is calculated by giving 1 point for each of the following prognostic features:

- confusion (abbreviated Mental Test score 8 or less, or new disorientation in person, place or time)^[b]
- raised respiratory rate (30 breaths per minute or more)
- low blood pressure (diastolic 60 mmHg or less, or systolic less than 90 mmHg)
- age 65 years or more.

Patients are stratified for risk of death as follows:

- 0: low risk (less than 1% mortality risk)
- 1 or 2: intermediate risk (1-10% mortality risk)
- 3 or 4: high risk (more than 10% mortality risk)”

The more recent NICE Rapid guidance produced during COVID19 on pneumonia (originally released on 3/4/2020 and then further updated on 23/April/2020) suggest

that assessment for potential pneumonia (the most common reason for hospital admission pre COVID) (5) should be:

“Where physical examination and other ways of making an objective diagnosis are not possible, the clinical diagnosis of community-acquired pneumonia of any cause in an adult can be informed by other clinical signs or symptoms such as:

- temperature above 38°C
- respiratory rate above 20 breaths per minute
- heart rate above 100 beats per minute
- new confusion”

This is very similar in the clinical situation with those who have significant COVID disease where hospital admission needs consideration. The original Knowsley, Barnet CCG and subsequently widely circulated London recommendations which appear to have been recently adapted by Somerset all suggest (and it is recognised that people with severe COVID often have ongoing fever

- Respiratory rate 21-22/m
- HR (pulse) 100 – 119/m

So clinical examination finding can be similar.

The symptomatology at presentation is also very similar with cough, fever, breathlessness predominating in both conditions. Sputum production is fairly typical of bacterial pneumonia, but atypical bacterial pneumonia may not have this and nor may early phase bacterial pneumonia(6) ; similarly patients with COVID have a productive cough in around 30% with more severe disease(7) hence should not be relied upon to determine cause.(8)

The NICE Guidance on pneumonia (5) and Oxford review(8) suggest we consider some parameters to try to distinguish between viral and bacterial pneumonia – but acknowledge this can be difficult.

COVID 19 / Viral pneumonia	Bacterial pneumonia
<ul style="list-style-type: none">• presents with a history of typical COVID-19 symptoms for about a week• has severe muscle pain (myalgia)• has loss of sense of smell (anosmia)• is breathless but has no pleuritic pain• has a history of exposure to known or suspected COVID-19, such as a household or workplace contact.	<ul style="list-style-type: none">• becomes rapidly unwell after only a few days of symptoms• does not have a history of typical COVID-19 symptoms• has pleuritic pain• has purulent sputum.

Expert opinion added suggestions include(8)*

COVID 19 / Viral pneumonia	Bacterial pneumonia
<ul style="list-style-type: none">• Insidious onset• Lower temperature• Tachycardia or tachypnea out of proportion to the temperature• A paucity of physical findings on pulmonary exam disproportionate to the level of disability• Bilateral positive lung finding	<ul style="list-style-type: none">• Acute onset• Higher temperature• Unilateral positive lung findings

Hence the differential between COVID19 or pneumonia may be clear – but as so many clinical scenarios – often the history we get from our patient can be tricky to obtain and less precise, and the findings can indicate both. We should be on the alert however for pneumonia to co-exist with COVID19, to see COVID19 on its own – and with fairly similar symptoms see our more familiar pneumonia.

The new NICE guidance sensibly advocates:

- As COVID-19 pneumonia is caused by a virus, antibiotics are ineffective.
- Do not offer an antibiotic for treatment or prevention of pneumonia if:
 - COVID-19 is likely to be the cause and
 - symptoms are mild.
- Inappropriate antibiotic use may reduce availability if used indiscriminately, and broad-spectrum antibiotics in particular may lead to *Clostridioides difficile* infection and antimicrobial resistance.

BUT: Offer an oral antibiotic for treatment of pneumonia in people who can or wish to be treated in the community if:

- the likely cause is bacterial or
- it is unclear whether the cause is bacterial or viral and symptoms are more concerning or
- they are at high risk of complications because, for example, they are older or frail, or have a pre-existing comorbidity such as immunosuppression or significant heart or lung disease (for example bronchiectasis or COPD), or have a history of severe illness following previous lung infection.

When starting antibiotic treatment, the **first-choice oral antibiotic is:**

- doxycycline 200 mg on the first day, then 100 mg once a day for 4 days (5-day course in total); doxycycline should not be used in pregnancy
- alternative: amoxicillin 500 mg 3 times a day for 5 days.

Doxycycline is preferred because it has a broader spectrum of cover than amoxicillin, particularly against *Mycoplasma pneumoniae* and *Staphylococcus aureus*, which are more likely to be secondary bacterial causes of pneumonia during the COVID-19 pandemic. **[amended 23 April 2020]**

- Do not routinely use dual antibiotics.
- For choice of antibiotics in penicillin allergy, pregnancy and more severe disease, or if atypical pathogens are likely, see the [recommendations on choice of antibiotic in the NICE antimicrobial prescribing guideline on community-acquired pneumonia](#).
- Start antibiotic treatment as soon as possible, taking into account any different methods needed to deliver medicines to patients during the COVID-19 pandemic

- Oral corticosteroids

Do not routinely offer a corticosteroid unless the patient has other conditions for which these are indicated, such as asthma or COPD.

Final practical tips

Several guidelines that are published at the current time describe area 2A, 2B and 2C describing the difference between 2A and 2C as being a pulse between 99/m and 120 / min (and respiratory rate between 19 and 23/min).

It would be sensible to think about this group together as not mild disease, but not serious enough for immediate admission. Perhaps more important to think about

- Clinical history and speed of change
- Past medical history, age, sex
- Clinical parameters (RR more than 23/min; pulse more than 110/min; saturations of 94% or less should ring significant alarm bells)
- Some clinicians and guidance are highlighting **silent hypoxia** (when a patient has saturations of 95-96% - and can manage at rest, but on exertion can desaturate). Some of the guidelines have variously suggested use of 1 -2 minute walks, 30 or 40 stair steps, 30 or 40 pace tests; the references behind these are not robust (9); however the patient who is feeling considerably worse on relatively minor exertion should be considered high risk and worthy of further assessment – whether or not a 30 stair step test induces a drop in saturations.
- Safety netting advise being understood
- Call back within a maximum of 24 hours for review
- Consideration of loan of pulse oximetry for home monitoring if patient or family able with directions on when to recontact

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Reference

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