Are you confident in your diagnosis of asthma? Three case histories to challenge you

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Achieving an accurate diagnosis may take time and involves working with patients to help support their understanding about why there isn't always a quick answer or an immediate prescription. This is particularly the case with asthma. It is a variable and reversible condition, so measurements over time are key to help you and the patient feel confident about what you are treating.

The International Primary Care Respiratory Group (IPCRG) with 'asthmaxchange' have developed learning modules that include some real-life histories to work through in the diagnosis, management and ongoing support for people with asthma.

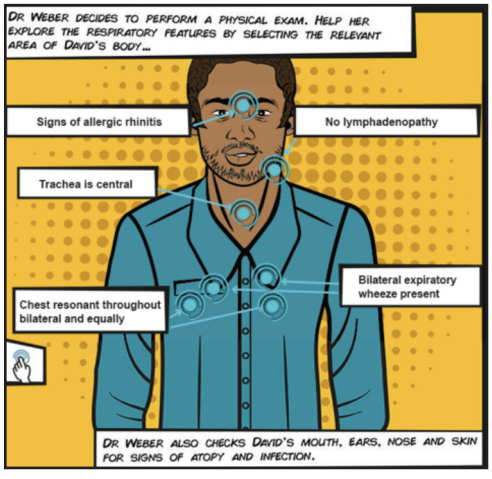
The three diagnosis cases highlight the opportunities that exist, particularly in primary care because of the ability to have regular contact over time with people to review results, response to treatment and to get the diagnosis right.

This case highlights that, even with difficult scenarios such as with Mei and her chronic cough, following a systematic approach supports you feeling confident that you got it right.

Case 1 – Make the most of the acute presentation when considering the possibility of a long-term condition diagnosis

David is a new patient who comes to see you late on a Friday afternoon in your duty surgery.

At first you wonder whether he is breathless because he rushed here before you close but soon you notice a few minutes into the consultation that his breathing is rapid, not settling, he doesn't complete sentences and he is beginning to look scared.



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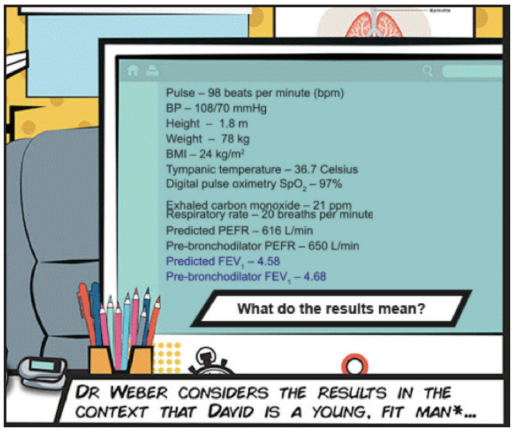
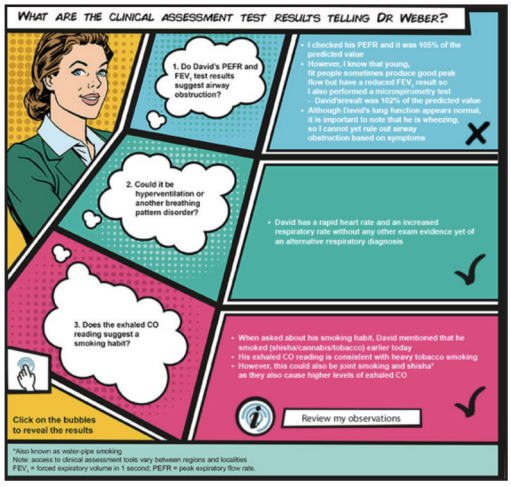
Case 1 – continued…

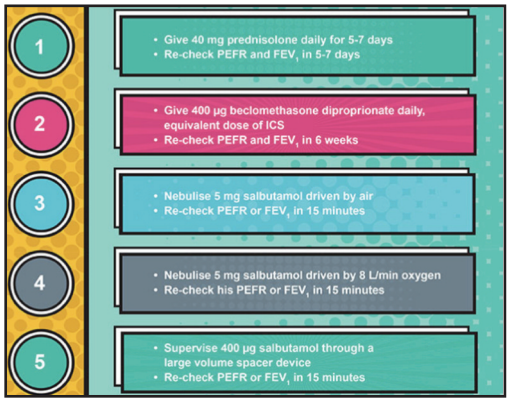
The history David shares is likely to help you make a diagnosis so spend time considering this. The exam can help support your initial conclusions and the investigations should be the final stage. What is the relevance of the clinical examination findings noted above?



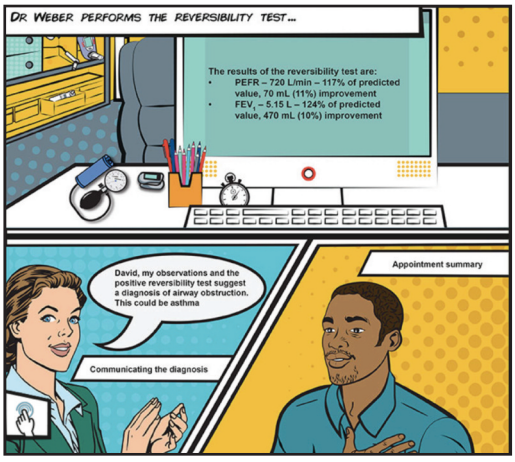


- David is a young, fit man but his heart rate is nearly 100 and his respiratory rate about double what it should be for someone his age. This means he is unwell
- He describes his chest as feeling tight and when I listen there is wheeze on both sides
  - It's a problem that has developed over a few days and one that David has experienced at least once in the past year. This scenario most likely suggests airway obstruction or new onset of asthma, and treatment of airway obstruction should help make this diagnosis; I must first exclude other conditions
- This case is complicated because his clinical presentation is airway obstruction and the numbers (FEV_1) don't fit with the clinical picture. I would expect an FEV_1 to be <70% predicted value
- Airway obstruction/asthma is diagnosed predominantly clinically so response to bronchodilator is an important next step; I will need to perform a reversibility test to either confirm the first suspected cause or lead me to consider another
- He is acutely unwell but his saturations are ok; he is scared but not confused so I'm confident to continue the assessment in my surgery rather than call an ambulance; though I am continuing to monitor and have oxygen and emergency kit available should the situation change

Which options would you choose next?



Dr Weber chooses option 5. She is using this opportunity to do a reversibility test. She is using a large volume spacer and pMDI to demonstrate to David – if asthma is confirmed – that you don't need special equipment to start to self manage an asthma attack.



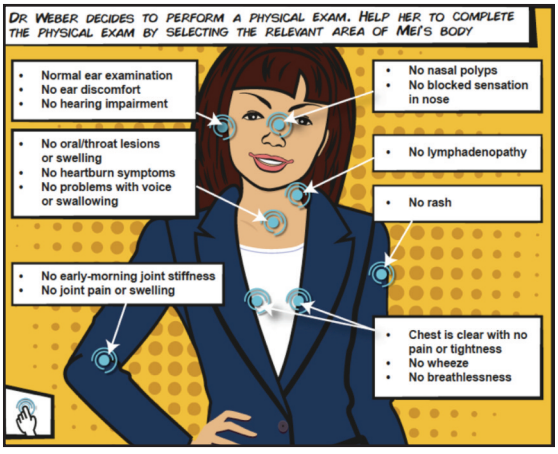
David feels better after the reversibility test making asthma a likely diagnosis. Taking time to both manage the acute event but also consider future care will save time in the long run.

- **Seeing a treatment-naïve patient with suspected asthma in general practice is an ideal opportunity to start the process of making a confident diagnosis because significant reversibility can be best detected at this time**
- **PEFR and FEV_1 readings <70% of predicted contribute towards a suspicion of airways obstruction and should usually trigger a trial of therapy**
- **However, higher readings and supernormal values cannot rule out asthma until reversibility has been checked**
  - **A 200 mL improvement in FEV_1 after salbutamol is suggestive of reversible airway disease, although a 400 mL improvement is more convincing[1]**
- **Making an asthma diagnosis requires gathering as much evidence as possible, as no single test on any one day will absolutely confirm it**
- **Write down why you think it is asthma and then track it in order to:**
  - **convince yourself**
  - **convince your patient**
- **An unclear or uncommunicated diagnostic rationale results in poor patient adherence, and the consequences can be over-use, under-use, and misuse of therapies resulting in low-value healthcare**
- **This highlights the importance of performing differential diagnosis in patients with suspected asthma**

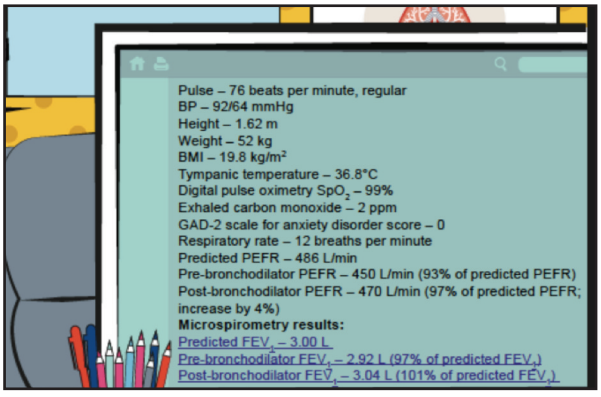
Case 2 – A systematic approach to diagnosing chronic cough

Managing chronic cough (a cough that lasts more than 8 weeks) can be a challenging process. We don't have a clear and definitive guideline to follow and the process often involves treatments as diagnostic aids. A systematic and shared approach is key to getting to the right answer.

Do you know why Dr Weber looked for these clinical signs below?



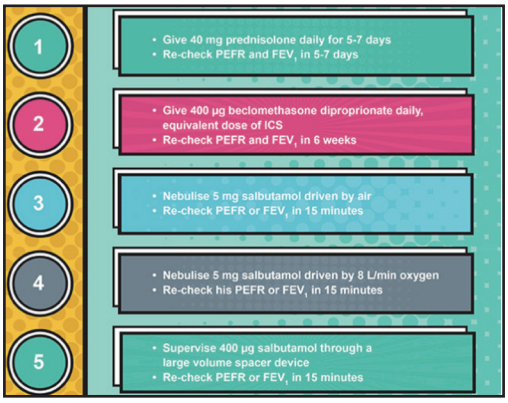
Do Mei's results lead you towards a specific diagnosis?



- Mei's principal symptom is her cough
  - Mei's physical exam does not suggest signs of atopy and her chest is clear, with no sign of wheezing
  - Her clinical assessment results appear to be normal
- This is a difficult situation and requires careful decision-making as well as managing Mei's expectations
- Dr Weber must also consider the timelines to either spontaneous recovery of Mei's cough or elucidation of cause through systematic testing

Mei is initially pushing for something to fix this quick and you can see why but you also know that the answer may not be available immediately and therefore you feel reluctant to treat before either knowing the cause or being clear about why you are providing therapy

What would you do now?



- None of these options will provide a quick fix for Mei's cough
- Dr Weber must use her consultation skills to show empathy and manage Mei's expectations
- Dr Weber should inform Mei of the possible options and reasons for including or excluding them and a timeline
- After a short discussion, Dr Weber and Mei both agree a way forward
  - Mei understands that taking medicines without a diagnosis can be harmful and unlikely to be helpful
  - However, she now feels empowered to go back to her line manager and Occupational Health to explain what will happen next and the expected timelines; she feels they will be able to agree a work programme in the meantime that will make work less stressful

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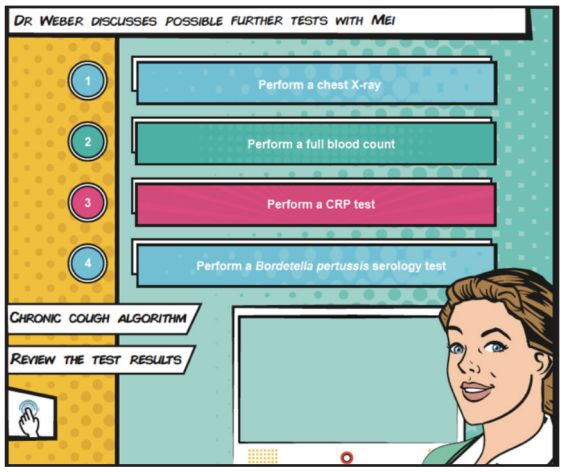
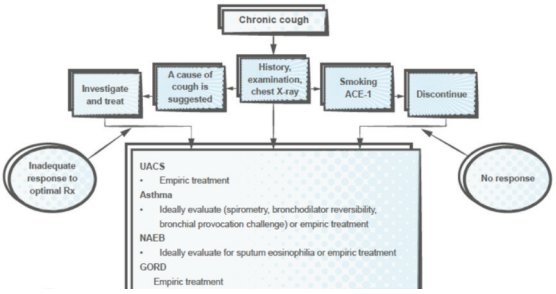
Case 2 – continued…

What are the tests you should do to exclude serious or communicable illness?



Mei's results are normal apart from a raised eosinophilia on the FBC.

Dr Weber now decides to progress through the chronic cough algorithm with Mei.

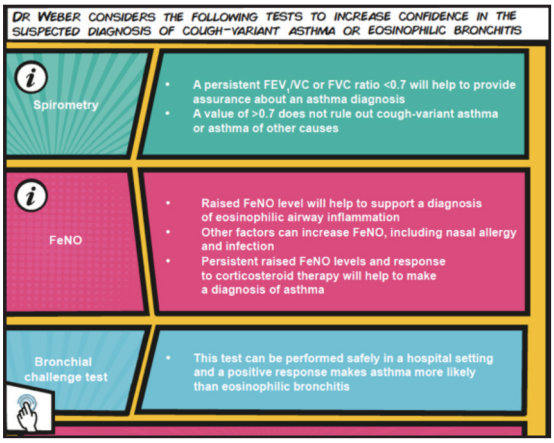


Dr Weber reviews Mei's results and notes that no condition is particularly clear but she has a shortlist of conditions for trials of therapy. These include i) upper airways cough syndrome (UACS), ii) asthma or cough variant asthma, iii) non-allergic eosinophilic bronchitis (NAEB) and iv) gastroesophageal reflux cough (GORD).

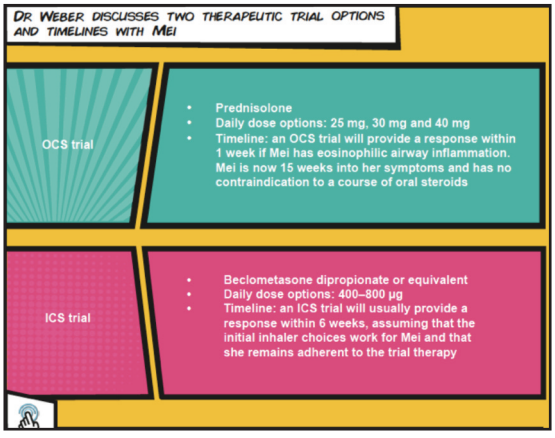
A recent review in *npj Primary Care Respiratory Medicine* of chronic cough with normal x-ray http://www.nature.com/articles/npjpcrm201581 determined the following diagnostic prevalence for chronic cough:

Diagnosis	n (%)
Asthma	75 (28.7)
Gastro-oesophageal reflux	56 (21.5)
ACEi use	37 (14.2)
Post-infective	30 (11.5)
Smoking	23 (8.8)
Upper airway pathology (rhinosinusitis)	17 (6.5)
COPD	5 (1.9)
Lower respiratory tract infection	4 (1.5)
Voluntary coughing/throat clearing	3 (1.1)
Malignancy	2 (0.8)
Bronchiectasis	1 (0.4)
Pulmonary fibrosis	1 (0.4)
Unexplained chronic cough	31 (11.9)
Spontaneously resolving	16 (6.1)
Persistent	15 (5.7)

Note: 19 patients (7.3%) had >1 diagnosis.
Abbreviations: ACEi, angiotensin-converting enzyme inhibitor; COPD, chronic obstructive pulmonary disease.



Dr Weber has access to spirometry only. Pre and post bronchodilator spirometry is perfomed. The tests show no reversibility and both tests sit within the normal range.



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Case 2 – continued…

Mei opted for a trial of oral corticosteroid. Dr Weber and Mei discussed how they would know whether it worked.

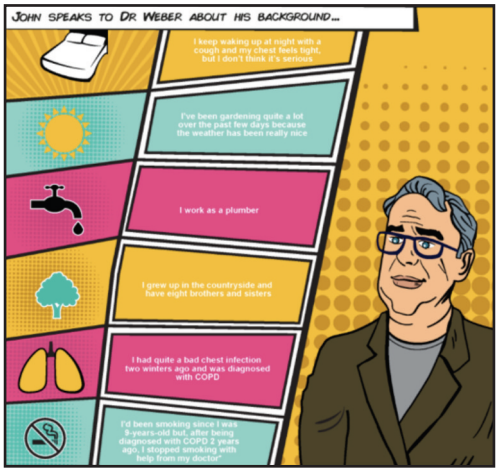
There are no primary care guidelines on how to assess a response in this scenario. However, various consensus statements by cough experts recommend a number of tests including the often-used generic visual analogue scale (VAS), which was used in Mei's case. The VAS requires the patient to record cough severity on a 100 mm linear scale, with 0 mm representing no cough and 100 mm representing the worst cough ever. A reduction of 20 mm represents an improvement

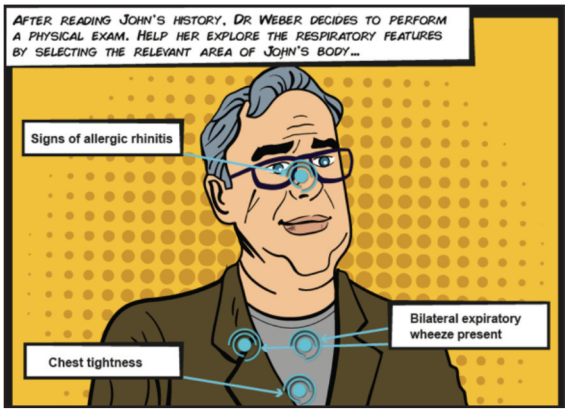
Mei's VAS results showed a 22.4 mm reduction in severity, which provided objective evidence of improvement. She also reported better quality of sleep and positive comments from work colleagues, providing reassurance that she had responded to treatment and that eosinophilic airway inflammation was a likely cause.

Dr Weber continued to treat Mei according to usual asthma therapy pathways. The final diagnosis was cough variant asthma. You can see more about Mei's results, the discussion she had with Dr Weber about trials of treatment for GORD and other decision and treatment algorithms at: https://www.asthmaxchange.com/e-learning/from-symptoms-to-diagnosis

Case 3 – Why good records and rechecking over time is key to better diagnosis

John comes to visit Dr Weber for antibiotics; he thinks he is getting another chest infection.

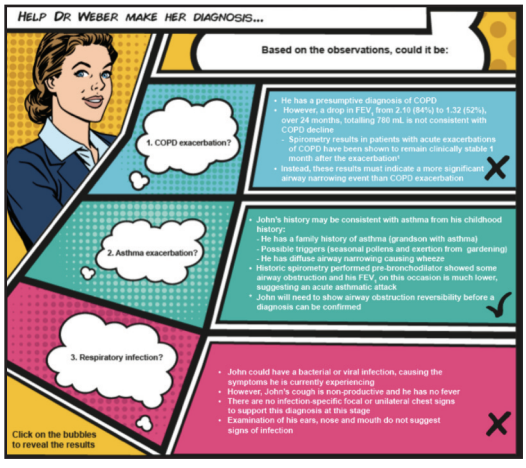




John has some desktop tests performed to help inform the findings from his history and examination

Pulse – 82 beats per minute (regular)
BP – 148/93 mmHg
Height – 1.55 m
Weight – 60 kg
BMI – 25 kg/m^2
Tympanic temperature – 36.5°C
Digital pulse oximetry SpO_2 – 94%
Exhaled carbon monoxide – 3 ppm
Respiratory rate – 22 breaths per minute
Predicted PEFR – 568 L/min
Pre-bronchodilator PEFR – 340 L/min (60% of predicted value)
FEV_1 – 1.32 L (52% of predicted value – 2.55 L)

Dr Weber already knows that John has airflow obstruction as he had quality assured spirometry 2 years ago. However, on that occasion his FEV_1 was 84% of predicted and today it is 52% of predicted. Dr Weber checks the quality again and ensures the details are correct and that the flow volume loop is suggestive of what the numbers say.



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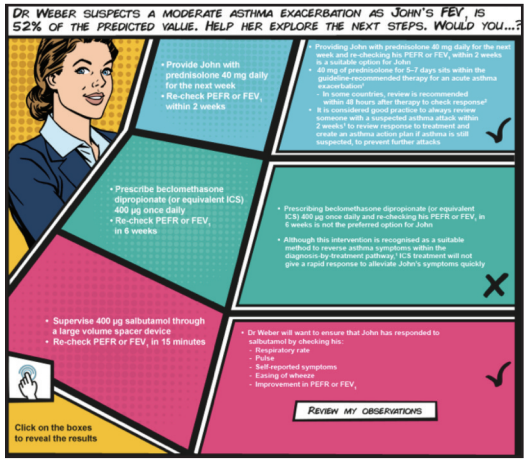
Case 3 – continued …

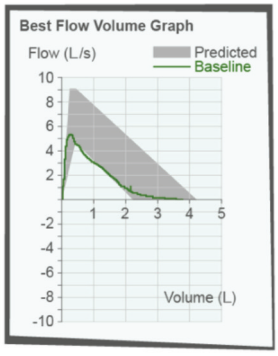


- From the two suitable options, Dr Weber decides to provide John with prednisolone 40 mg daily for the next week and re-check his PEFR or FEV_1 within 2 weeks
  - If John does respond to salbutamol, Dr Weber will want to give him some definitive treatment that she can be sure he will reliably take and which will alleviate his symptoms quickly
  - Therefore, prednisolone is indicated in this situation:
    - Oral steroids are associated with side effects. However, there is a greater risk to John's health from not treating the airway inflammation effectively
    - John has limited experience with inhalers; therefore, oral steroids seemed more appropriate in this case
    - Oral steroids have a fast onset of action, which will reduce John's symptoms quickly
- Even when considering an acute exacerbation of COPD, Dr Weber decides not to give John antibiotics as he does not show signs of infection (e.g. non-productive cough, no fever)
- Seeing John at 48 hours (or earlier if needed), 1 or 2 weeks, and 6 weeks will help Dr Weber gather information to reassess and communicate the diagnosis to John

John was seen 5 days later and the response convinced Dr Weber that there is a significant reversible and irreversible element to his airways disease.

- John feels much better
- His spirometry readings show his FEV_1 has returned to baseline, confirming reversibility with prednisolone
- His FEV_1/FVC ratio continues to show airway obstruction

Index	Base	%Pred
FEV_1	2.13 l	86%
FVC	3.82 l	118%
PEF	322 l/min	75%
FEV_1/FVC	56%	75%



FEV_1 = forced expiratory volume in 1 second; FVC = forced vital capacity; PEF = peak expiratory flow; PEFR = peak expiratory flow rate.

The learning point for Dr Weber here was that, even when you make a good quality diagnosis for breathlessness, it is likely that another condition may be present and so revisiting the diagnosis in a structured way is key to being a holistic practitioner. The asthma/COPD mix can only be determined by knowing people over time or having good records to review over time.

Patient safety tip: John was using a LAMA and SABA for mild COPD when he first presented. People with asthma on long acting bronchodilators with no inhaled steroids have poor outcomes. People with COPD have symptoms that decline slowly; if there is a more rapid progression or a greater frequency of flare ups, review the diagnosis by starting again, checking what you know and re-testing if necessary.