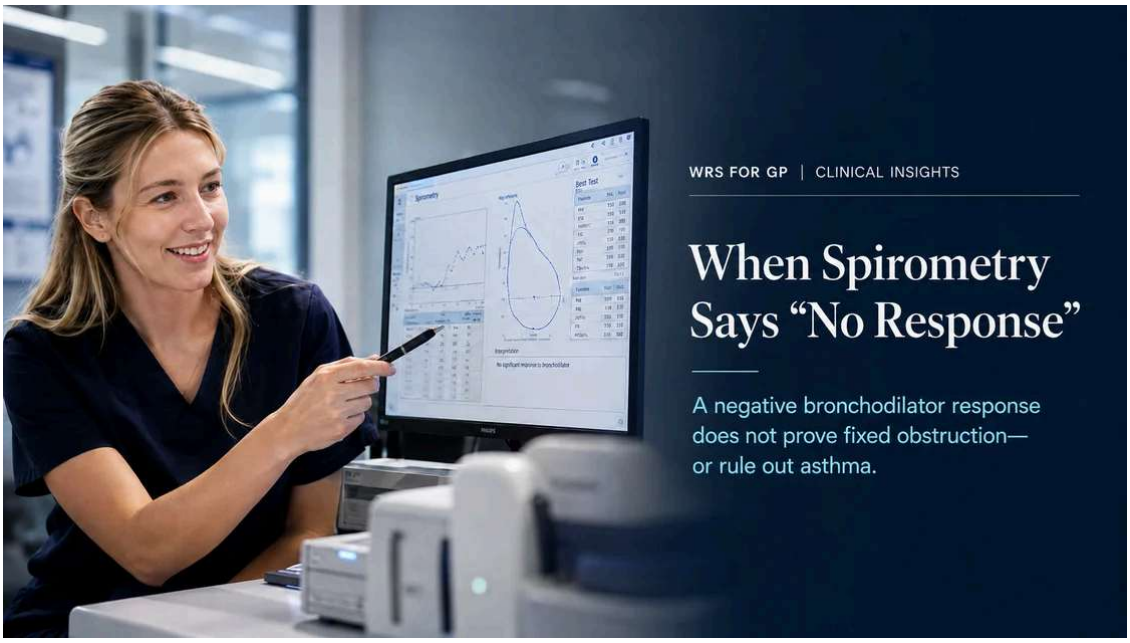


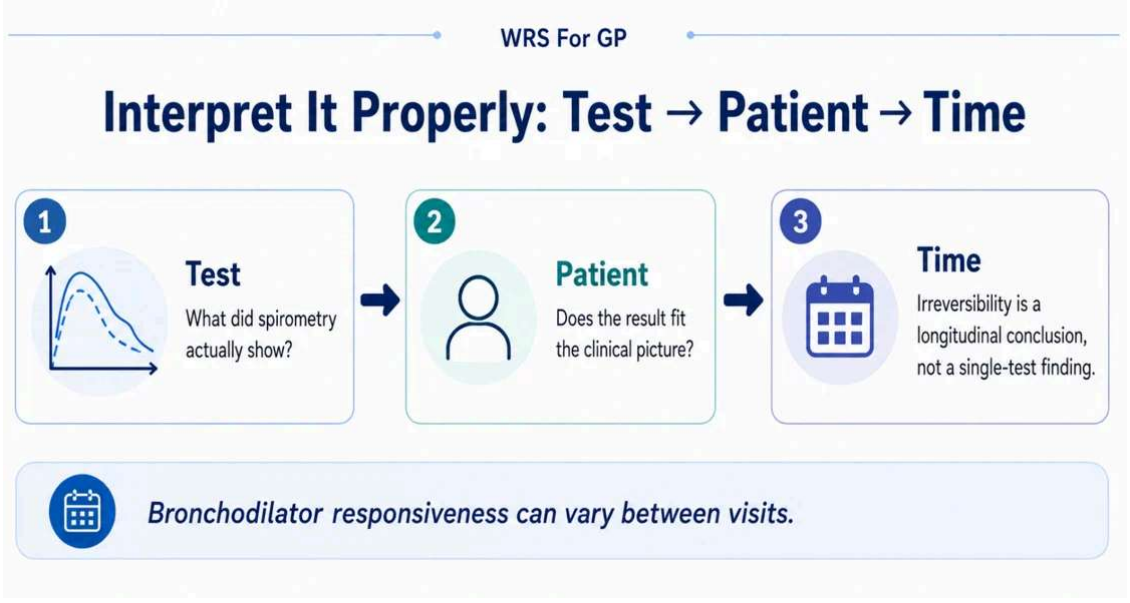
Quick Take

Problem
Spirometry shows airflow obstruction but reports "no significant bronchodilator response."

Insight
This does not prove that the obstruction is fixed or irreversible, and it does not exclude asthma.

Framework
Test → Patient → Time

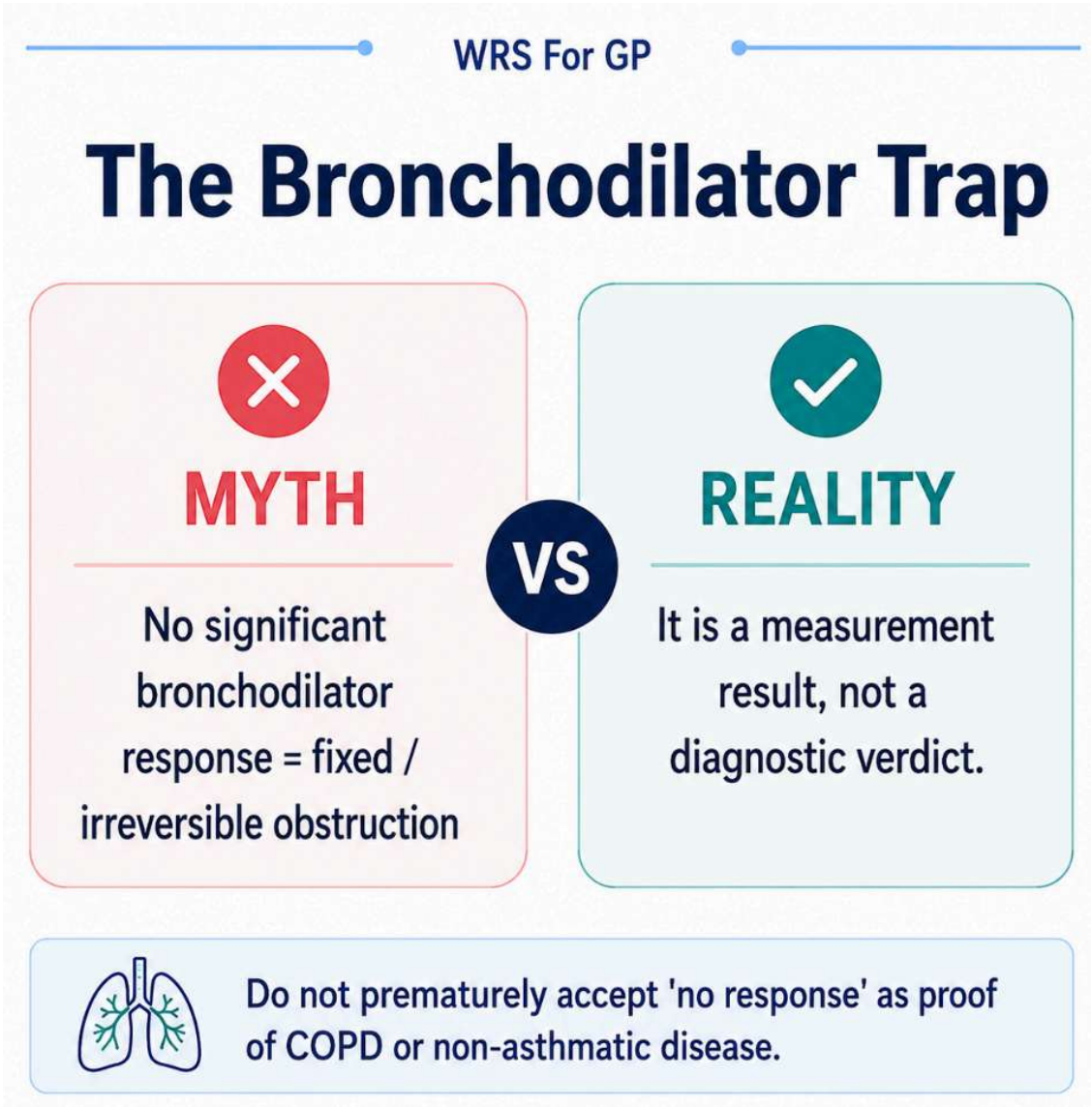
Action
Reassess the diagnosis before labelling the obstruction as fixed. If asthma remains plausible, investigate further. If the spirometry and clinical picture do not align, refer for clarification.



A 62-year-old smoker presents with breathlessness. Spirometry shows airflow obstruction and the report states: **“No significant bronchodilator response.”** Does this confirm chronic obstructive pulmonary disease with fixed obstruction? Perhaps—but not from this result alone.

One of the most common spirometry interpretation errors is treating “no significant bronchodilator response” as synonymous with “irreversible obstruction.” It is not. The statement describes whether the measured change crossed a defined threshold during one test. It does not establish the diagnosis, exclude asthma or prove that the airways cannot respond to treatment.

This matters in several familiar situations: the smoker prematurely labelled with chronic obstructive pulmonary disease, the patient with asthma whose obstruction persists on one test, and the patient who says, “I can breathe more easily now,” despite little numerical change after salbutamol.



What “no response” actually means

Bronchodilator responsiveness is usually assessed by comparing **forced expiratory volume in one second** and **forced vital capacity** before and after an inhaled bronchodilator.

“No significant response” means that neither measurement improved enough to meet the reporting criterion.

That is narrower than saying there was no response at all.

Spirometry measures maximal expiratory flow and volume. It does not directly measure airway resistance, work of breathing, gas trapping, hyperinflation or how comfortable ordinary tidal breathing feels.

A patient may genuinely report that breathing feels easier after salbutamol while the change in forced expiratory volume in one second or forced vital capacity remains below the threshold. Their perceived benefit should not be dismissed, although it is not diagnostic of asthma by itself.

The test is only as informative as the physiology it measures.
The result is also a snapshot. It depends on the patient's airway tone that day, whether bronchodilator medication was appropriately withheld, the timing of symptoms, current treatment and ordinary biological variability.
If the airways were relatively open at baseline, there may be little measurable room for improvement. Bronchodilator responsiveness may be present at one visit and absent at another.

The threshold has changed—but it is still only a threshold

The European Respiratory Society and American Thoracic Society now define a significant bronchodilator response as an increase of more than 10% of the predicted value in forced expiratory volume in one second or forced vital capacity. This replaced the older laboratory criterion based on both percentage and absolute change from the baseline value. The newer approach aims to reduce the influence of sex and lung size on whether a response is labelled significant.
Disease-specific asthma guidance may still use the familiar increase of at least 12% and 200 mL.

The important point is not which number appears on the report. Both are cut-offs applied to measured spirometric change—not diagnostic verdicts.

Interpret the test, the patient and the trajectory

A useful framework is:
1. Test
Ask what the test has actually demonstrated.
Is there airflow obstruction? Did forced expiratory volume in one second or forced vital capacity cross the bronchodilator threshold?
Do not extend that conclusion beyond what was measured.

2. Patient
Does the result fit the clinical picture?
Smoking increases the likelihood of chronic obstructive pulmonary disease, but it does not exclude asthma. Asthma can also develop persistent airflow limitation, particularly after many years.
Conversely, a significant bronchodilator response can occur in chronic obstructive pulmonary disease and does not prove asthma by itself.

3. Time
Irreversibility is a longitudinal conclusion, not a finding from one spirometry session. When obstruction remains present across serial post-bronchodilator tests, the more accurate term is **persistent airflow limitation** rather than "fixed obstruction." Even then, the diagnosis still depends on the clinical context.
Chronic obstructive pulmonary disease requires compatible symptoms and exposures together with persistent post-bronchodilator airflow obstruction. A single

negative bronchodilator response is not enough.



What should happen next?

When asthma remains clinically plausible, do not close the diagnosis.
Depending on the situation, the next step may include:

- repeating spirometry when the patient is symptomatic and after appropriate medication withholding;
- serial peak expiratory flow monitoring;
- an objectively assessed trial of inhaled corticosteroid-containing treatment;
- assessment of Type 2 inflammatory markers;
- bronchial provocation testing; or
- respiratory referral.

The practical message is simple:
“No significant bronchodilator response” is a measurement result—not proof that airflow obstruction is fixed, irreversible or non-asthmatic.
Before labelling the obstruction as fixed, reassess the diagnosis. If asthma remains plausible, investigate further. If the spirometry and clinical picture do not align, refer for clarification.

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