


# Peak expiratory flow

Peak expiratory flow	
Diagnostics	
<div></div> <div>A peak flow meter issued in the UK.</div>	
MeSH	D010366 <sup>[1]</sup>

The **peak expiratory flow (PEF)**, also called **peak expiratory flow rate (PEFR)** is a person's maximum speed of expiration, as measured with a **peak flow meter**, a small, hand-held device used to monitor a person's ability to breathe out air. It measures the airflow through the bronchi and thus the degree of obstruction in the airways.

## Function

Peak flow readings are higher when patients are well, and lower when the airways are constricted. From changes in recorded values, patients and doctors may determine lung functionality, severity of asthma symptoms, and treatment options.

First measure of precaution would be to check patient for signs and symptoms of asthmatic hypervolemia. This would indicate whether or not to even continue with the Peak Flow Meter procedure. Measurement of PEFR requires training to correctly use a meter and the normal expected value depends on a patient's sex, age and height. It is classically reduced in obstructive lung disorders such as asthma.

Due to the wide range of 'normal' values and high degree of variability, peak flow is not the recommended test to identify asthma. However, it can be useful in some circumstances.

A small proportion of people with asthma may benefit from regular peak flow monitoring. When monitoring is recommended, it is usually done in addition to reviewing asthma symptoms and frequency of reliever medication use.<sup>[2]</sup>

When peak flow is being monitored regularly, the results may be recorded on a peak flow chart.

It is important to use the same peak flow meter every time.

## Scales

There are a number of non-equivalent scales used in the measurement of Peak Flow.<sup>[4]</sup>

Graphs or tables are available of predicted normal values based on a person's sex, age and height, and online calculators<sup>[5]</sup> are available. There is a wide natural variation in results from healthy test subjects.

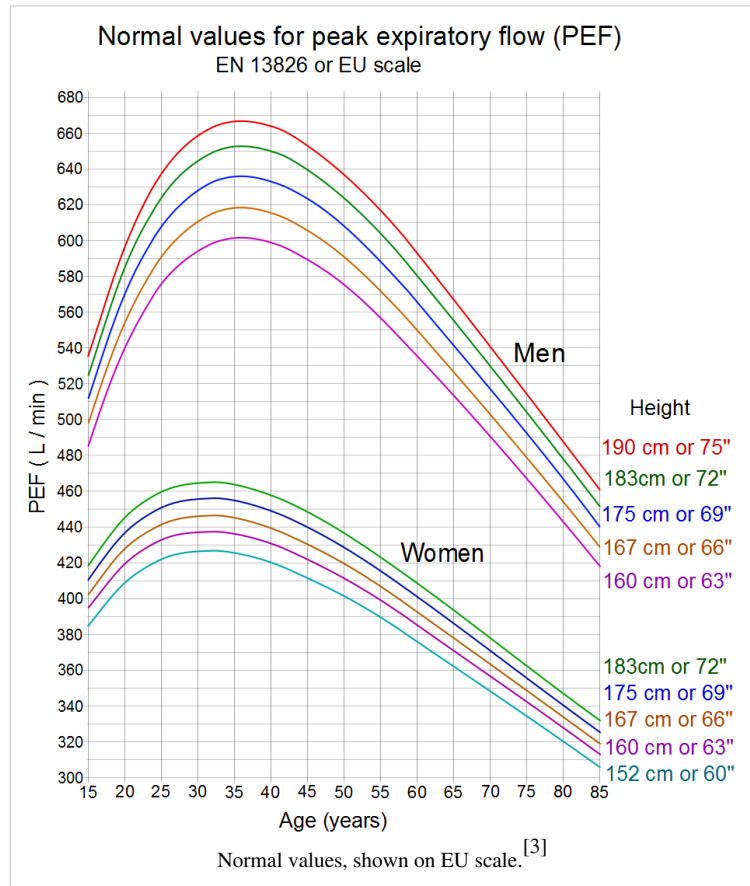
- *Wright scale*<sup>[6]</sup> <sup>[7]</sup>
- *EN 13826* or EU scale<sup>[8]</sup>
- *A.T.S.* (American Thoracic Society) scale

In 2004 the UK switched from the original Wright scale to the newer, more accurate European scale. Limited information on converting between the scales exists.<sup>[9]</sup>

## Measurement

The best of three readings is used as the recorded value of the Peak Expiratory Flow Rate. It may be plotted out on graph paper charts together with a record of symptoms or using peak flow charting software. This allows patients to self-monitor and pass information back to their doctor or nurse.<sup>[10]</sup>

Peak flow readings are often classified into 3 zones of measurement according to the American Lung Association<sup>[11]</sup> ; green, yellow, and red. Doctors and health practitioners can develop an asthma management plan based on the green-yellow-red zones.



This peak flow meter uses the EU scale.

Zone	Reading	Description
Green Zone	80 to 100 percent of the usual or normal peak flow readings are clear.	A peak flow reading in the green zone indicates that the asthma is under good control.
Yellow Zone	50 to 79 percent of the usual or normal peak flow readings	Indicates caution. It may mean respiratory airways are narrowing and additional medication may be required.
Red Zone	Less than 50 percent of the usual or normal peak flow readings	Indicates a medical emergency. Severe airway narrowing may be occurring and immediate action needs to be taken. This would usually involve contacting a doctor or hospital.

## History

The measurement of peak expiratory flow was pioneered by Martin Wright, who produced the first meter specifically designed to measure this index of lung function. Since the original design of instrument was introduced in the late 1950s, and the subsequent development of a more portable, lower cost version (the "Mini-Wright" peak flow meter), other designs and copies have become available across the world.

## References

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