

PEAK EXPIRATORY FLOW RATE

Dr. Shrikant Wagh MD

Bronchial asthma, chronic bronchitis, and chronic obstructive lung disease are very common causes of respiratory disability. The increased airway resistance in these disorders is due to the narrowing of the airways due to various causes. A good history and clinical examination are very important in the diagnosis and management of these disorders. In absence of reliable objective parameters, we have been exclusively relying upon clinical examination until recently. These are subjective criteria and vary from patient to patient and from time to time. Studies have shown that exclusive clinical examination is not sufficient in assessing the severity of these disorders and hence their practical management.

Various spirometers are used in pulmonary laboratories for objective assessment of lung volumes. These are costly and time-consuming. Pocket spirometers are still under evaluation and are not manufactured in India. Exhaling up to maximum capacity can itself induce bronchospasm and precipitate an exacerbation of asthma.

Peak expiratory flow rate (PEFR) is measured by asking the patient to exhale hard and fast into a flow meter after taking a maximum deep inspiration (total lung capacity). PEFR correlates well with the force expiratory volume in the first second (FEV), airway resistance, and severity of asthma. Normal PEFR in Indians is 400-650 liters/min in males and 300/450 liters/min in females. It varies with age, sex, height, weight (body surface area), and history of smoking.

25 years after its first description by Wright and McKerrow, Mini Peak flow meters (MPFM) are now manufactured in India. MPFM is a cheap (less than Rs 300/-), simple, portable, and accurate instrument for measuring PEFR. This is a very useful instrument for objective evaluation of airway disorders in an emergency room, hospital wards, home, and family doctor's office. It provides valuable information in diagnosis, assessment of severity, and response to treatment in asthma and subclinical bronchospasm. In absence of the instrument,

management of asthmatics would be incomplete and inaccurate. Just as we monitor hypertensive patients with a sphygmomanometer, all asthmatics should be monitored with a Peak flow meter. It can also be used in patients on beta-blockers which can precipitate bronchoconstriction. MPFM has also been used in epidemiological studies, monitoring occupational lung diseases, clinical trials, and in the health education of smokers.



Instructions for use:

1. Keep the pointer at the lower end of the scale.
2. Explain the procedure to the patient and ask the patient to take a full breath to the level of total lung capacity.
3. Ask the patient to open the mouth and close the lips tightly around the mouthpiece. Hold the instrument horizontally with scale facing upwards or sideways.
4. The patient should then blow into the instrument as hard and fast as the patient can for a single breath.
5. The pointer will move along the scale and will indicate the PEFR of the patient.
6. Push back the pointer to the lower end of the scale and repeat the procedure after one minute. The best of the three readings is the PEFR of the patient at that time.
7. Remove the mouthpiece and wash it with soap and water. Wipe it dry and replace it for reuse.