

# CLINICAL TIPS Series - N. 6

## WHERE and HOW can respiratory oscillometry (FOT) be used?

Version 1 - 19 th MAY 2024

### PULMONARY DEPARTMENTS

In these clinical settings, physicians have a background in lung physiology, commonly utilize forced spirometry and other complex PFT tests, such as body plethysmography, DLCO or Diffusion capacity testing, etc. For them, oscillometry can be helpful to assess subjects with alterations not visible with spirometry, when spirometry is difficult to perform (such as children and the elderly), and those at risk of side effects from the forced respiratory maneuver.

In all these situations, the diagnostic questions typically revolve around:

- Is there an obstruction or alteration in the airways and if so, where is it located, small airways, or central or heterogenous?
- Is the obstruction reversible? Oscillometry can easily be used to check for a response to treatment, or medication with approved, published thresholds for significant response.
- Does the patient (typically COPD of a certain gravity or in severe asthma) experience expiratory flow limited breaths that prevent the lung from emptying and promote lung hyperinflation? In that case, the validated, widely used parameter  $\Delta Xrs$  can be precious to detect and quantify EFLt.

Moreover, these users could also be interested in the additional ADVANCED clinical measurements offered by the RESMON PRO FULL: specific conductance (sGr<sub>s</sub>), tidal breathing loops, and Closing Volume by oscillometry (CV<sub>fot</sub>).

### PEDIATRIC RESPIRATORY DEPARTMENTS, INCLUDING OFF SITE TESTING (SCHOOLS ETC.)

In this context, physicians work on subjects under 18 years of age, often very young. They are often limited by the cooperation of about 50% of their patients, therefore ease of use and quick measurements are crucial. The diagnostic questions typically revolve around:

- Is there an obstruction or alteration in the airways and if so, where is it located, small airways, or central or heterogenous?
- Is the obstruction reversible? Oscillometry can easily be used to check for a response to treatment, or medication with approved, published thresholds for significant response.

Tidal expiratory flow limitation is not commonly observed in children, and pediatricians may not be particularly interested in this topic, unless testing Cystic Fibrosis and monitoring over time effects of treatments.

**Encourage adoption for better respiratory diagnosis**

## MAKE OSCILLOMETRY ROUTINE

## RESPIRATORY, NEURO AND CARDIAC REHABILITATION, THORACIC SURGERY

In this context, a general understanding of lung physiology is present only among physicians and therapists working in pulmonary rehabilitation. However, respiratory alterations are not limited to patients in respiratory rehab; those in neuro and cardiac rehab may also experience respiratory issues that are often not diagnosed.

Spirometry is not commonly performed in these settings due to a lack of trained personnel, and inability of many patients to perform spirometry tests. In this context, it is challenging to determine whether interventions, physiotherapy sessions, or secretions removal devices (i.e Flutter®, Acapella® Choice, or cough assist devices, etc.) have effectively impacted the airways.

As a result, their primary interest lies in detecting abnormalities and, even more importantly, in evaluating changes in the degree of obstruction and tidal expiratory flow limitation (EFLt) following therapeutic interventions.

## INTERNAL MEDICINE, ACUTE RESPIRATORY MEDICINE DEPARTMENTS, GERIATRIC DEPT

These departments are often where COPD patients are admitted during exacerbations or for respiratory failure, with some patients also presenting concomitant cardiologic conditions that can manifest symptoms similar to those of respiratory diseases (e.g., dyspnea). In such circumstances, spirometry is not recommended, while tidal breathing testing could be helpful for:

- Evaluating the presence of obstruction and tidal expiratory flow limitation (EFL) to identify or quantify respiratory symptoms.
- Assessing possible recovery during the hospital stay and response to medications.

## RESPIRATORY ALLERGY, ADULT & PEDIATRIC

Allergologists routinely employ bronchial reversibility tests via spirometry as part of their standard practice and to confirm diagnosis of asthma, by response to a bronchodilator. Their primary objective is to assess the presence and reversibility of airway obstruction, evaluate treatment responses between visits, over time, for controls, and check for compliance with prescribed therapy.

They can use oscillometry in patients difficult to assess by spirometry, such as pediatric patients, severe asthmatics, but also mild asthma, when there are no symptoms or spirometry may be normal to:

- Identify the presence of peripheral/central airway obstruction.
- Conduct bronchial reversibility tests, for which oscillometry is now approved, with significant response thresholds.
- Perform bronchial challenge testing (i.e. Methacoline, Histamine etc.) with published thresholds, for which oscillometry has been shown to be faster, more sensitive than spirometry and can avoid deep inhalation, which may be influencing response to the broncho-constrictor agent.

**Encourage adoption for better respiratory diagnosis**

# MAKE OSCILLOMETRY ROUTINE

## OCCUPATIONAL MEDICINE, INCLUDING OFF-SITE TESTING (WORKPLACE, FACTORIES, ETC.)

According to occupational medicine guidelines, spirometry is the recommended technique for screening and monitoring workers at risk of developing respiratory diseases. While oscillometry is not yet included in these guidelines, its use for monitoring and detecting lung function among individuals exposed to various environmental or occupational hazards and with no symptoms has been documented.

In this context, the most relevant approach is to use oscillometry to identify early signs of obstruction, even in patients with no symptoms, and to monitor their development over time during periodic controls.

## CYSTIC FIBROSIS UNITS

Lung function tests are not typically used as a diagnostic tool for cystic fibrosis (CF), and departments treating CF patients, may not always have a background in lung physiology.

CF affects the respiratory system by causing the buildup of thick mucus in the airways. Among the treatment options, physicians often prescribe Airway Clearance Techniques (ACT) to help clear mucus from the airways. These techniques can include manual chest physical therapy, chest-worn devices, or portable mucus-clearing devices designed to dislodge trapped mucus.

Since not all techniques are suitable for every patient, oscillometry can be utilized to quantify the airways clearance therapy' effectiveness on the airways. Therefore, the main clinical applications in this context are the detection of abnormal peripheral and central obstruction, tidal expiratory flow limitation (EFL), and if feasible, the measurement of Closing Volume before and after ACT treatment.

**Encourage adoption for better respiratory diagnosis**

**MAKE OSCILLOMETRY ROUTINE**