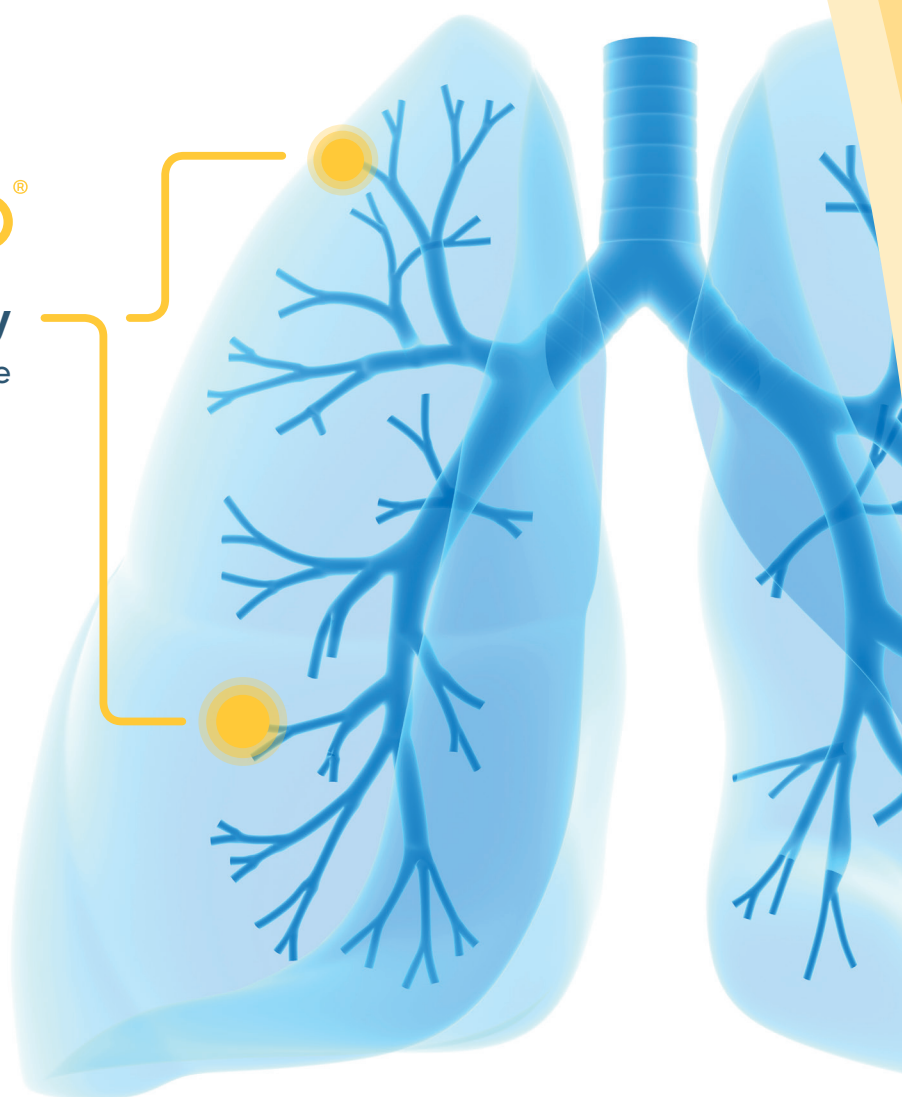


# Shaping New Perspectives on Pulmonary Function



**Airwave Oscillometry**  
Fast, Easy, Portable



**THORASYS**

# tremoflo Benefits



Tidal Breathing  
No forced expiration.



Intra-Breath Analysis  
Insp/Expiratory analysis.



Respiratory Mechanics  
Info related to small airways. <sup>3</sup>



Easy Daily Calibration  
Less than 30sec.



Fast & Easy  
Test in a few min.



Compact & Portable  
Weighs only 700 g.



Adult & Pediatric  
Normative values provided.



Pre/Post testing  
Automated Workflows.



## The Importance of Small Airways

The tremoflo C-100 provides information related to small airway function.

"The small airways are frequently involved early in the course of [asthma and COPD] diseases, with significant pathology demonstrable often before the onset of symptoms or changes in spirometry and imaging."

*McNulty and Usmani, ECRJ 2014 <sup>1</sup>*

"Peripheral airway impairment may be clinically relevant at all levels of asthma severity and control."

*Galant et al., AAAI 2017 <sup>2</sup>*

## Oscillometry Outcomes

Summary of clinician interpretations per published studies

A pair of two curves calculated from the raw data reflects the mechanical properties of the respiratory system in characteristic patterns. Several key outcome parameters are then derived from these curves.

## Expert Opinions

Oscillometry offers "an in-office tool that can assess peripheral airway impairment even in young children and may detect airway obstruction earlier than spirometry."

*Galant et al., AAAI 2017*

"Monitoring small airway function by [Oscillometry] can be useful in identifying patients who are at risk for losing asthma control, and in assisting with clinical decisions and treatment plans."

*Bickel et al., Chest 2014*

Oscillometry "allows for the discrimination of inspiratory and expiratory resistance and reactance ... to help discriminate between asthma and COPD."

*McNulty & Usmani, ECRJ 2014*

Oscillometry "has been found to be useful in measuring response to bronchodilators, such as salbutamol and ipratropium, in patients with asthma and COPD."

*Bickel et al., Chest 2014*

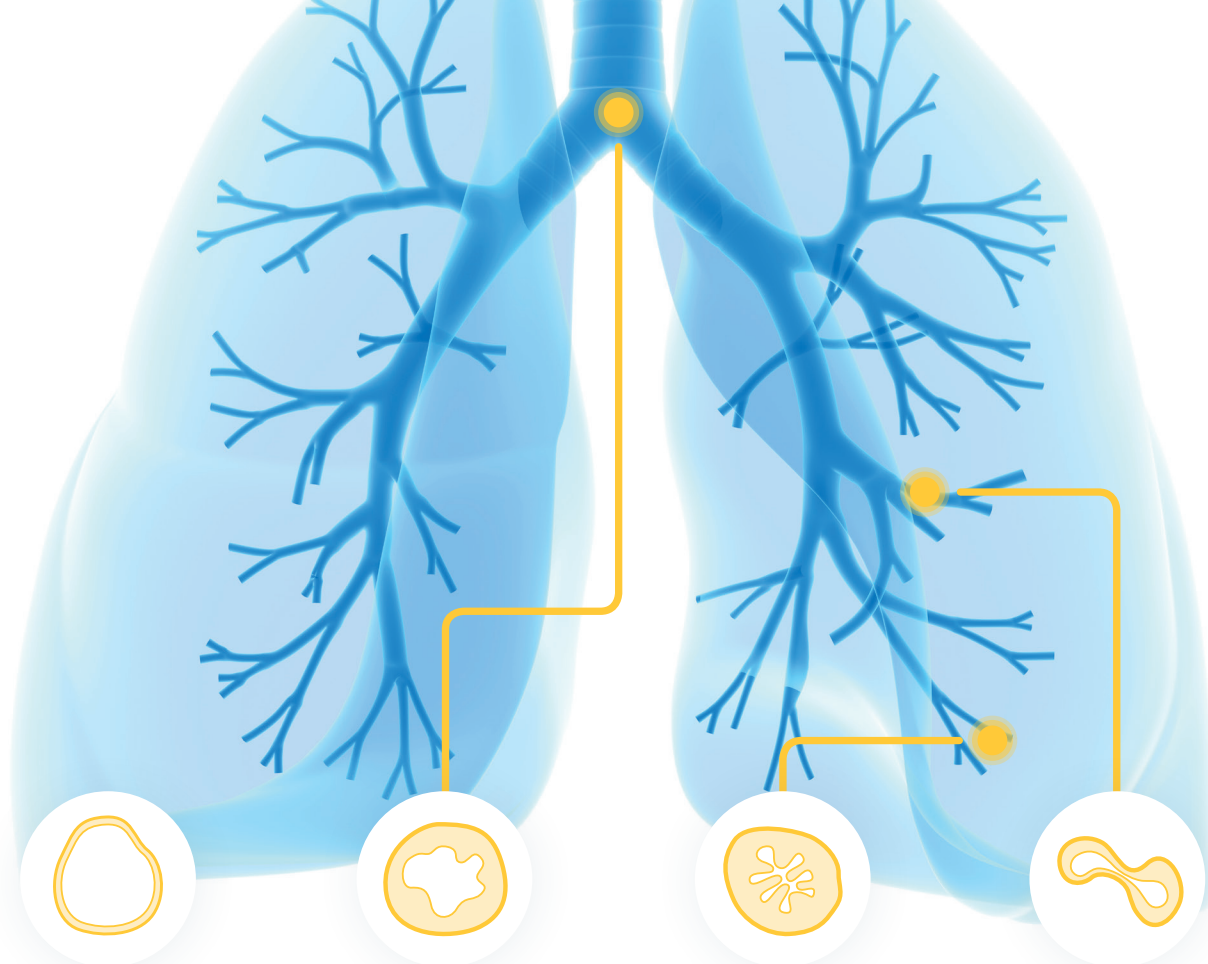




# Airwave Oscillometry Fundamentals

tremoflo measurements are fast and easy.  
The patient just breathes quietly.

To assess respiratory function, the tremoflo adds a gentle oscillatory wave to the patient's regular, quiet breathing. A short measurement duration of only 20 seconds allows three repetitions within a couple of minutes, even in patients who have difficulty performing spirometry.

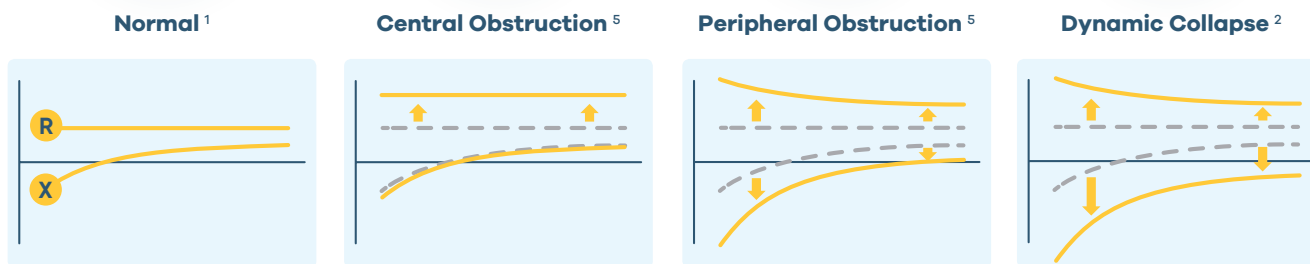


## Characteristic Patterns

**R** The **Resistance** curve shown to reflect central and peripheral airways. <sup>3</sup>

**X** The **Reactance** curve shown to reflect elasticity and peripheral airways. <sup>4</sup>

## Key Outcomes



$R_5$	Resistance at 5 Hz <sup>1</sup>	Normal	↑	↑	↑
$R_{5-20}$	Resistance change, 5 to 20 Hz <sup>1</sup>	Close to zero	Close to zero	↑	↑
$AX$	Reactance area <sup>1</sup>	Normal	Normal	↑	↑↑
$X_{5, \text{in-ex}}$	Reactance difference insp-exp. <sup>2</sup>	Close to zero	Close to zero	Small	↑

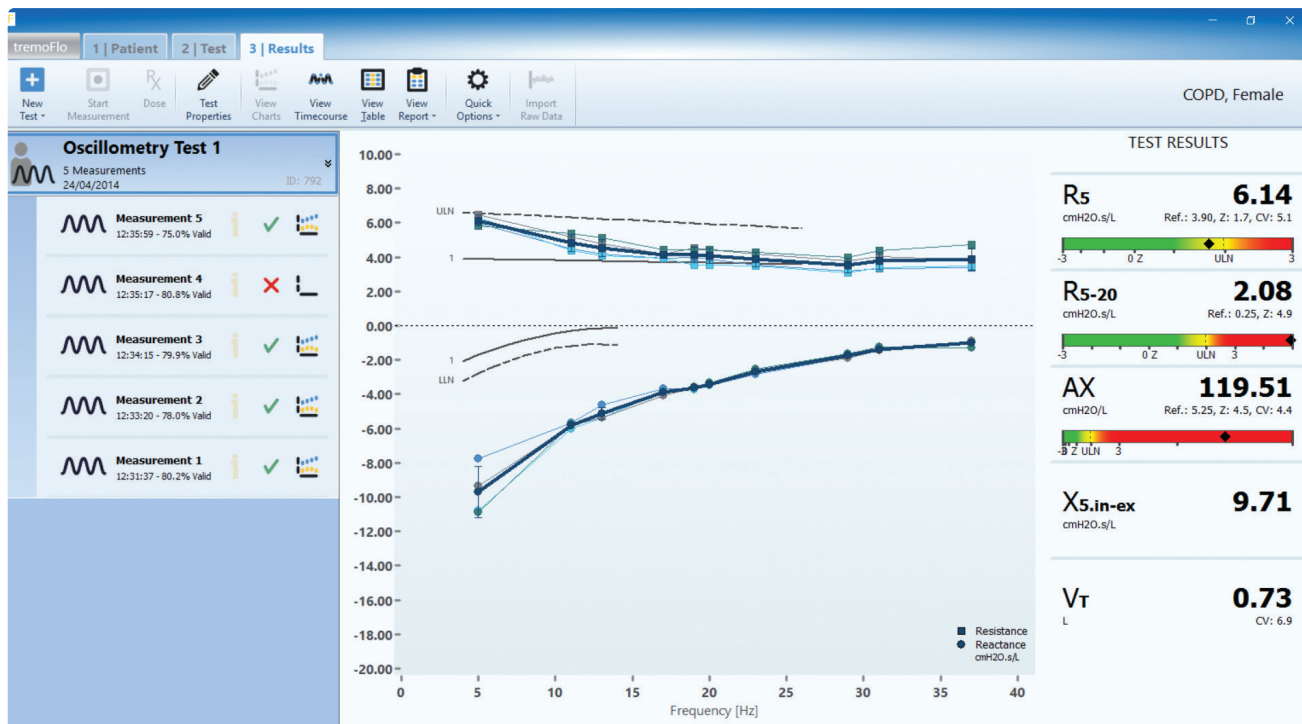


# Actual tremoflo Data

A simple green-to-red gauge scale clearly shows whether patients fall within or outside normative values that are available for pediatrics and adults.



Pre/Post Test  
Asthma Patient



COPD Patient

# tremoflo C-100

## Airwave Oscillometry System (AOS)

<b>Measurement Principle</b>	Oscillometry (Forced Oscillation Technique, FOT)
<b>Oscillator Technology</b>	Breathe-through Vibrating Mesh (Patented)
<b>Measurement Modes</b>	AOS: Pseudo-random noise
<b>Measurement Duration</b>	20 sec (typ.), user adjustable 3 repetitions (as per guideline)
<b>Patient Interface</b>	Bacterial/viral filter with integrated mouthpiece
<b>Dimensions &amp; Weight</b>	19 x 13 x 14 cm, 0.7 kg (handheld only) 21 x 14 x 24 cm, 1.7 kg (handheld & cradle)
<b>Performance</b>	Meets and exceeds ERJ 2003, 22: 1026-1041
<b>Covered Markets</b>	Canada, United States, Israel EU (European Community), Australia/NZ

More information at [www.tremoflo.com](http://www.tremoflo.com)



<sup>1</sup> Hirsh et al., AAAI 2011

<sup>2</sup> Vassiliou et al., EUR RESPIR J. 1996

<sup>3</sup> Usmani et al., RESPIRATORY MEDICINE 2016

<sup>4</sup> Al-Alwan et al., AJRCCM 2014

<sup>5</sup> Galant et al., AAAI 2017

<sup>6</sup> Johnson et al., THORAX 2007

The content of this document is believed to be accurate at the time of release. However, THORASYS and its affiliates offer no guarantees, expressed or implied, in case of typographic or other errors. All specifications are subject to change without notice.

**Caution: Federal (USA) law** restricts this device to sale by or on the order of a licensed practitioner.

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