Early detection of small airway disease such as asthma, chronic obstructive pulmonary disease (COPD) and cystic fibrosis (CF) is of great importance for further disease progression. The EXHALYZER®D offers comprehensive possibilities for effective pulmonary function testing, including the most widely applied spirometry and more sensitive multiple breath washout, revealing detailed information on the small airways. Controlled by SPIROWARE® software, it is easy to use and meets highest standards of functionality.

References:
From tidal breathing analysis to inert gas washouts, from volumetric capnography to spirometry, the EXHALYZER® D offers various tests to assess lung function.

- **MULTIPLE BREATH WASHOUT (MBW)** is the most sensitive method to detect early lung disease. It can be carried out using the tracer gas SF₆, typically applied on infants or 100% oxygen to washout the nitrogen in the lung (N₂:MBW).¹ ²
- **LUNG CLEARANCE INDEX (LCI)** is the main outcome of the multiple breath washout. It describes the overall gas mixing efficiency of the lung. Further parameters can distinguish the location of ventilation inhomogeneity.
- **SINGLE BREATH WASHOUT (SBW)** presents a quick alternative to assess ventilation inhomogeneity.¹
- **TIDAL BREATHING ANALYSIS** is a simple and noninvasive tool, in particular for infants and children, requiring only minimal patient cooperation.³
- **SPIROMETRY** is widely used to assess and monitor overall lung function.⁴
- **VOLUMETRIC CAPNOGRAPHY** allows the determination of further physiological information based on CO₂ dynamics.

**WIDE RANGE OF PULMONARY FUNCTION TESTS**

Several parameters such as etCO₂, VD and VT are constantly monitored and displayed during measurement in order to meet defined quality criteria.

**AUTOMATIC QUALITY CONTROL**

All lung function tests are performed and evaluated according to the current recommendations of the ATS and ERS.¹ ² ³.

**ATS/ERS COMPLIANCE**

State-of-the-art components ensure high precision and accuracy of the instrument. The accuracy of ultra-sonic flow and volume measurement is not influenced by turbulence, humidity or temperature changes in the respiratory flow.

**UNMATCHED ACCURACY**

Exchangeable accessories guarantee optimal conditions for the measurement of different age groups.

**SUITABLE FOR INFANTS, CHILDREN AND ADULTS**

Operator and patient are guided with easy to follow instructions through the preparation and execution of a measurement.
Multiple breath or single breath washouts measure the efficiency of gas mixing in the lung (FRC/LCI) and represent a very sensitive method for diagnosis of small airway disease. Nitrogen washouts as well as SF\textsubscript{6} washouts are possible. For nitrogen washouts, the single and multiple breath technique can be applied.

The analysis of tidal flow and volume is a simple, yet very valuable method to study lung function even in non-cooperating infants and children.

Spirometry is the most common pulmonary function test and measures the volume and flow of the inhaled and exhaled air.

Volumetric Capnography reveals physiological information about metabolic production, circulatory transport and CO\textsubscript{2} elimination within the lungs, as well as the determination of dead.