MasterScreen IOS Impulse Spirometry

The Impulse Oscillometry Spirometer - IOS - uses only quiet breathing and has demonstrated to be more sensitive than spirometry alone

Even if technically good results can be obtained with spirometry, a number of unanswered questions can still be left.

Based on the recording of a few tidal breaths, impulse oscillometry has demonstrated to be more sensitive under resting conditions than spirometry in measuring small airways obstruction, post bronchodilator effects and bronchial hyper-responsiveness.

As central and peripheral airway obstruction can be differentiated by impulse oscillometry, the effectiveness of modern drug therapy can now be better assessed.

Highlights

- Spirometry and airway resistance diagnostics combined in one compact device
- Single flow sensor technology for entire pulmonary function platform (spirometry, IOS, plethysmography, DLCO) minimizes instrument variability when upgrading or expanding
- Comprehensive hygiene solution - single use barrier filter or complete disassembly for disinfection and sterilization
- Software applications designed to help deliver clinically intelligent diagnostics

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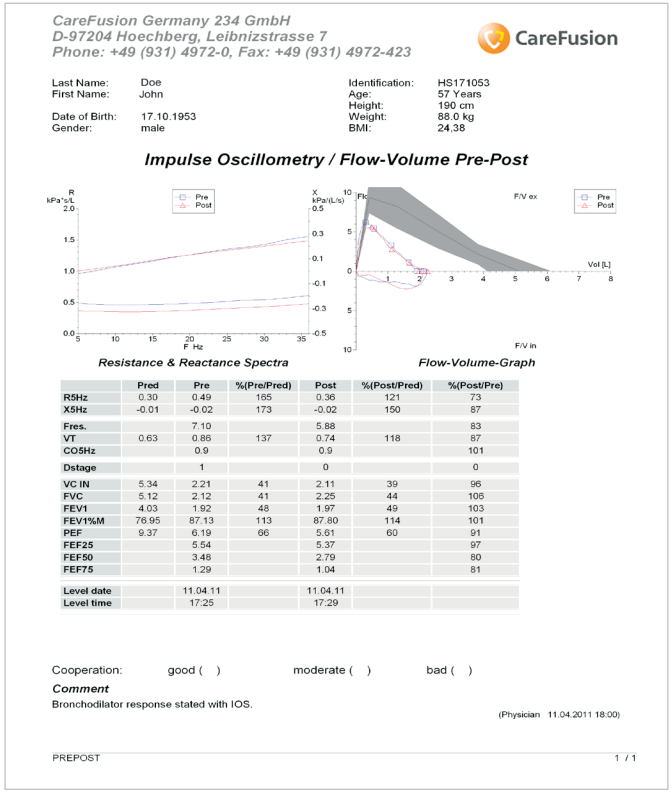

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Last Name: Doe
First Name: John

Date of Birth: 17.10.1953
Gender: male

Identification: HS171053
Age: 57 Years
Height: 190 cm
Weight: 88.0 kg
BMI: 24.38

Impulse Oscillometry / Flow-Volume Pre-Post

Resistance & Reactance Spectra

Flow-Volume-Graph

	Pred	Pre	%(Pre/Pred)	Post	%(Post/Pred)	%(Post/Pre)
R5Hz	0.30	0.49	165	0.36	121	73
X5Hz	-0.01	-0.02	173	-0.02	150	87
Fres.		7.10		5.88		83
VT	0.63	0.86	137	0.74	118	87
CO5Hz		0.9		0.9		101
Dstage		1		0		0
VC IN	5.34	2.21	41	2.11	39	96
FVC	5.12	2.12	41	2.25	44	106
FEV1	4.03	1.92	48	1.97	49	103
FEV1%M	76.95	87.13	113	87.80	114	101
PEF	9.37	6.19	66	5.61	60	91
FEF25		5.54		5.37		97
FEF50		3.48		2.79		80
FEF75		1.29		1.04		81
Level date		11.04.11		11.04.11		
Level time		17:25		17:29		

Cooperation: good ( ) moderate ( ) bad ( )

Comment
Bronchodilator response stated with IOS.

(Physician 11.04.2011 18:00)

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IOS can provide objective response to drug therapy even when FEV1 can´t

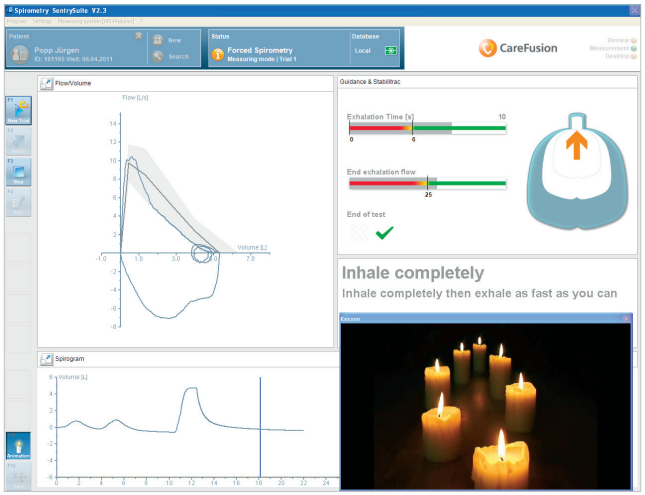
The test report above displays the following: Spirometry is abnormal in the "Pre"-measurement and shows no significant response to brochodilation in the "Post"-measurement.

IOS clearly shows an abnormal central obstruction in the "Pre"-measurement. Post bronchodilation IOS indicates normal lung function resulting from a significant reversible central obstruction. This patient is hyper-reactive because R5 decreased > 25%.

With just Spirometry the patient's hyper-responsiveness would be missed, the degree of abnormality under resting conditions would be overestimated and the type of obstruction could not have been specified.

The experts found that…

- Impulse oscillometry and plethysmography should be considered the preferred techniques for measuring bronchodilation in COPD Clinical Trials [1]
- Several forced oscillation measures are more accurate and sensitive for detecting bronchodilator response than FEV(1) in patients with asthma [2]
- Methacholine-induced asthma symptoms correlate with impulse oscillometry but not spirometry [3]
- Impulse oscillometry provides an effective measure of lung dysfunction in 4-year old children at risk for persistent asthma [4]
- Spirometry underestimated the prevalence of lung function abnormalities in comparison to forced oscillation [5]



Forced Spirometry with animation

Spirometry highlights:

- Slow Spirometry, Forced Spirometry and MVV inclusive Pre/Post handling comes standard with MasterScreen IOS
- More than 10 adjustable incentive programs individualize animation to patient needs
- Clear end-of-test criteria notification for Forced Spirometry
- Quality check for each trial and repeatability control according ATS/ERS recommendations
- Stabilitrac for improved repeatability

Maximizing clinical output

The APS pro, Aerosol Provocation System, seamlessly integrates into the MasterScreen IOS. The SentrySuite™ measurement programs and provocation program "work hand in hand". User-specific protocols and observation modules can be generated for both - specific and non-specific bronchial provocation testing.

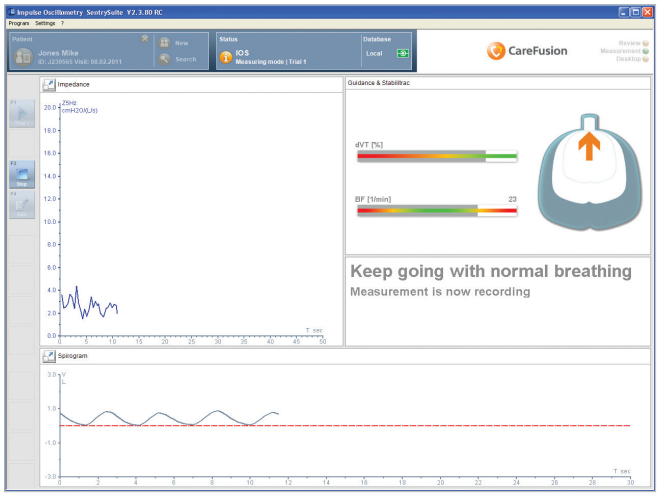
The concept of APS pro allows bronchial provocation protocols to use a single concentration of the challenge substance, making bronchial provocation testing cost effective, easier to perform and increase workflow efficiency.

MasterScreen IOS with integrated APS pro

Empowering clinicians through advanced diagnostics

The Impulse Oscillometry Spirometer - IOS - combines spirometry and airway resistance diagnostics in one compact device. When used together with a notebook computer the IOS is portable and ready for bedside, outpatient, and work site applications. With the IOS a larger patient range can be tested than with spirometry alone, from elderly down to young children, severe and neuromuscular diseased patients, making the IOS useful in more clinical settings. Taking this all into account, the IOS is especially suited for use in the fields of pulmonary, pediatric, geriatric and occupational medicine.

IOS can test a larger patient range than spirometry alone



Just one key stroke and 20 seconds of quiet breathing ...

SentrySuite's new multiple trial concept - improved test quality

SentrySuite™ takes Impulse Spirometry to the next level

SentrySuite software, or SeS, is a unique collection of software applications designed to help improve productivity and efficiency. The Guidance instructional application helps technicians coach their patients through the actual measurement with intelligent text and graphical messages designed to maximize patient performance and meet quality criteria such as ATS/ERS recommendations.

Friendly for patient and technologist

- Effort-independent Pulmonary Function Testing: activated by just one key stroke multiple quiet tidal breaths can be recorded automatically within one 20 second trial
- FRC stability testing: the FRC stability line supports stable and reproducible breathing
- Easy artifact detection: the new multiple trial concept within SentrySuite™ allows for automated artifact detection and rejection
- Improved test quality: the 'Best' result is optimized by averaging all acceptable trials instead of just one
- Automated classification and interpretation simplify reporting, help improve workflow and provide consistency

New MicroGard® II filter and FreeFlow™ mouthpiece

[1] Z L Borrill, C M Houghton, A A Woodcock, J Vestbo, and D Singh Medicines Evaluation Unit, North-west Lung Centre, Wythenshawe Hospital, Manchester, UK Br J Clin Pharmacol. 2005 April; 59(4): 379–384. doi: 10.1111/j.1365-2125.2004.02261.x

[2] Yaegashi M, Yalamanchili V, Kaza V, Weedon J, Heurich A, Akerman M. Respir Med. 2007 May;101(5):995-1000

[3] Mansur AH, Manney S, Ayres JG. Resp Med. 2007 Sep 25. Respiratory Medicine, Birmingham Heartlands Hospital NHS Trust, Birmingham, West Midlands, UK

[4] Marotta A, Klinnert, M, Price, M, Larsen, G. Liu, A.H. J Allergy Clin Immunol 2003; 112(2): 317-322. Division of Pediatric Allergy and Immunology, National Jewish Medical and Research Center, and the Department of Pediatrics, University of Colorado Health Sciences Center, Denver, 80206, USA

[5] Skloot G, Goldman M, Fischler D, Goldman C, Schechter C, Levin S, Teirstein A. Chest. 2004 Apr;125(4):1248-55. Division of Pulmonary and Critical Care Medicine, Mount Sinai School of Medicine, New York, NY, USA. Skloot G, Goldman M, Fischler D, Goldman C, Schechter C, Levin S, Teirstein A. Chest. 2004 Apr;125(4):1248-55. Division of Pulmonary and Critical Care Medicine, Mount Sinai School of Medicine, New York, NY, USA

⚠ **CAUTION** - U.S. Federal Law restricts this device to sale by or on the order of a physician.

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