

FOT (Forced Oscillation Technique) - Oscillometry LITERATURE, PUBLICATIONS SUMMARY

1

REVO - October 2023

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Note 1: in each section the data is shown from newest to oldest

Note 2: same reference may be present in more than one section if pertinent information to both

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COPD, ADULT, REHABILITATION, SLEEP, COVID-19

Singh, Priyanka; Saxena, Puneet; Ahuja, Nitin B.; Chopra, Manu; Yadav, Aseem; Tiwari, Saurabh
SPIROMETRY PARAMETERS VERSUS FORCED OSCILLOMETRY PARAMETERS IN OBSTRUCTIVE AIRWAY DISEASE – IS THERE A CORRELATION?

Lung India – May-June 2023, Vol 40, Issue 3, Page 291-294

ATS 2023 Poster Presentation:

LINKING PATHOPHYSIOLOGY TO LUNG PATHOLOGY IN SPIROMICS USING RESPIRATORY OSCILLOMETRY (OSC) AND HIGH-RESOLUTION COMPUTED TOMOGRAPHY (HRCT)

C. B. Cooper, B. A. Dolezal, R. L. Dellaca, E. A. Hoffman, J. M. Reinhardt, I. Barjaktarevic, R. Buhr, D. P. Tashkin, L. A. Bateman, D. Couper, W. H. Anderson, M. B. Drummond, S. P. Bhatt, S. I. Rennard, S. P. Peters, R. E. Kanner, R. Paine, J. L. Curtis, M. K. Han, R. Barr, F. J. Martinez, P. Woodruff
American Journal of Respiratory and Critical Care Medicine, ATS Meeting Abstracts, 2023, Washington, DC – Presentation A108 - “A new insight into Chronic Obstructive Pulmonary disease” session

ARTP 2023 poster communication

EFFECT OF BREATHING PATTERN ON AIRWAYS RESISTANCE AND REACTANCE USING FORCED OSCILLATORY TECHNIQUE (FOT)

M. Howlett-Foster, E. O’ Neill, Karl Sylvester

ARTP – Association for Respiratory Technology and Physiologists, Brighton, UK, 16-18 March, 2023

Chiara Veneroni, Roberto Perissin, Fabiano Di Marco, Raffaele L. Dellaca

HOME MONITORING OF LUNG MECHANICS BY OSCILLOMETRY BEFORE, DURING AND AFTER SEVERE COVID-19 DISEASE: A CASE STUDY

ERJ Open Research 2023; DOI: 10.1183/23120541.00480-2022

Roberto “Roby” Perissin

WHAT' S NEW IN PULMONARY FUNCTION DIAGNOSTICS - FOT AND FENO - FORCED OSCILLATION TECHNIQUE FOLLOWING THE LATEST INTERNATIONAL ERS TECHNICAL STANDARDS AND ITS USE WITH FENO, EXHALED NITRIC OXIDE”.

Respiratory Therapy, winter 2023, Vol 18, N. 1, pages 54-58,

Sabina Kostorz-Nosal ,Dariusz Jastrzebski 1, PiotrKubicki, DagmaraGalle, Alicja Gałeczka-Turkiewicz,Beata Toczyłowska, DariuszZiora

FORCED OSCILLATION MEASUREMENTS IN PATIENTS WITH IDIOPATHIC INTERSTITIAL PNEUMONIA SUBJECTED TO PULMONARY REHABILITATION

J.Clin. Med.2022,11,3657

Sabina Kostorz-Nosal, Dariusz Jastrzebski, Aleksandra Zebrowska, Agnieszka Bartoszewicz and Dariusz Ziora

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THREE WEEKS OF PULMONARY REHABILITATION DO NOT INFLUENCE OSCILLOMETRY PARAMETERS IN POSTOPERATIVE LUNG CANCER PATIENTS

Medicina 2022, 58(11), 1551; <https://doi.org/10.3390/medicina58111551>

Wei Qian, Avani Desai, Jennifer H. Therkorn, Jacquelyn C. Klein-Adams, Anays M. Sotolongo, Michael J. Falvo

EMPLOYING THE FORCED OSCILLATION TECHNIQUE FOR THE ASSESSMENT OF RESPIRATORY MECHANICS IN ADULTS

JOVE - J. Vis. Exp. (180), e63165, doi:10.3791/63165 (2022)

Video journal, article and video: <https://www.jove.com/it/t/63165/employing-forced-oscillation-technique-for-assessment-respiratory>

Chiara Torregiani, Chiara Veneroni, Paola Confalonieri, Gloria Maria Citton, Francesco Salton, Mohamad Jaber, Marco Confalonieri, Raffaele Lorenzo Dellaca'

MONITORING RESPIRATORY MECHANICS BY OSCILLOMETRY IN COVID-19 PATIENTS RECEIVING NON-INVASIVE RESPIRATORY SUPPORT

PLOS ONE | <https://doi.org/10.1371/journal.pone.0265202> March 21, 2022

Paolo Pelosi, Roberto Tonelli, Chiara Torregiani, Elisa Baratella, Marco Confalonieri, Denise Battaglini, Alessandro Marchioni, Paola Confalonieri, Enrico Clini, Francesco Salton and Barbara Ruaro

DIFFERENT METHODS TO IMPROVE THE MONITORING OF NONINVASIVE RESPIRATORY SUPPORT OF PATIENTS WITH SEVERE PNEUMONIA/ARDS DUE TO COVID-19: AN UPDATE

J. Clin. Med. 2022, 11, 1704. <https://doi.org/10.3390/jcm11061704>

Augusta Beech, Natalie Jackson, James Dean, Dave Singh

EXPIRATORY FLOW LIMITATION IN A COHORT OF HIGHLY SYMPTOMATIC COPD PATIENTS

ERJ Open Res 2022; in press - <https://doi.org/10.1183/23120541.00680-2021>

C. A. Monroig-Rivera, N. Ramirez-Lluch, S. E. Carlo, A. Santiago Cornier, W. De Jesus-Rojas

RESPIRATORY IMPEDANCE IN A PATIENT WITH JARCHO-LEVIN SYNDROME MEASURED BY FORCED OSCILLATION

American Journal of Respiratory and Critical Care Medicine, ATS Meeting Abstracts, 2022 – A65
PULMONARY CLINICAL CASES II / Thematic Poster Session / Sunday, May 15/09:30 AM-03:45 PM /

Jaber S. Alqahtani, Ahmad M. Al Rajeh,, Abdulelah M. Aldhahir, Yousef S. Aldabayan, John R. Hurst, Swapna Mandal

THE CLINICAL UTILITY OF FORCED OSCILLATION TECHNIQUE DURING HOSPITALISATION IN PATIENTS WITH EXACERBATION OF COPD

ERJ Open Res 2021; 7: 00448-2021 - <https://doi.org/10.1183/23120541.00448-2021>

Sajal De

DIAGNOSTIC ACCURACY OF RESPIRATORY IMPEDANCE TO DETECT AIRFLOW OBSTRUCTION IN ADULTS

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INDIAN JOURNAL OF ALLERGY, ASTHMA AND IMMUNOLOGY - VOLUME 35, ISSUE 1, JANUARY-JUNE 2021 10.4103/ijaai.ijaai_6_21

Muzna Khan, Jose Rojas, Syed A. Shah, Catherine Sampson, Roger Seeton, Richard Branson, Dario Rodriquez and Michael Kinsky

UTILIZING FORCED OSCILLOMETRY TECHNIQUE AS A MEASURE OF AIRWAY RESISTANCE, AND LUNG REACTANCE COMPARED TO SPIROMETRY

Respiratory Care October 2021, 66 (Suppl 10) 3610633

Also a short YOUTUBE video : www.youtube.com/watch?v=KKIZmNUbLn4

C. Torregiani C. Veneroni P. Confalonieri, G. Citton, F. Salton, M. Jaber, M. Confalonieri, R. Dellaca'
MONITORING LUNG MECHANICS BY OSCILLOMETRY IN COVID 19 ARDS RECEIVING NON-INVASIVE VENTILATION: A PILOT STUDY

ERS congress 2021 – virtual congress - Part of session: Acute non-invasive respiratory therapies in COVID-19 and beyond – Poster ID: 1771

Neeraj Gupta, Anil Sachdev, Suresh Gupta, Dhiren Gupta

COVID-19—A SPUTNIK MOMENT TO REVITALIZE OSCILLOMETRY

The Indian Journal of Pediatrics – March 2021 - <https://doi.org/10.1007/s12098-021-03709-5>

A. Veli, G. Vaghegini, C. Veneroni, L. Perugino, L. Bertini, S. Nasoni, L. Carrozzi, R. Dellacà)
COVID-19 MANAGEMENT IN AN ITALIAN PRISON. MONITORING OF PULMONARY FUNCTION USING OSCILLOMETRY

ERS congress 2021 – virtual congress - Part of session: Lung function evaluation and assessment of airway diseases– Poster ID: 1074

Sabina Kostorz-Nosal , Dariusz Jastrzębski , Dariusz Ziora

FORCED OSCILLATION MEASUREMENTS IN PATIENTS AFTER LOBECTOMY - A COMPARATIVE ANALYSIS WITH IPF AND COPD PATIENTS

Clin Respir J . 2021 Oct 26. doi: 10.1111/crj.13298

Chiara Veneroni, Alain Van Muylem, Andrei Malinovschi, Alain Michils, and Raffaele L. Dellaca'
CLOSING VOLUME DETECTION BY SINGLE BREATH GAS WASHOUT AND FORCED OSCILLATION TECHNIQUE

Journal of Applied Physiology 2021, <https://doi.org/10.1152/jappphysiol.00440.2020>.

Giulia Michela Pellegrino, Massimo Corbo, Fabiano Di Marco, Pasquale Pompilio , Raffaele Dellacà, Paolo Banfi , Riccardo Pellegrino - , Giuseppe Francesco Sferrazza Papa

EFFECTS OF AIR STACKING ON DYSPNEA AND LUNG FUNCTION IN NEUROMUSCULAR DISEASES

Arch Phys Med Rehabil. 2021 Mar 9 ;S0003-9993(21)00185-4. doi: 10.1016/j.apmr.2021.01.092.

Silvia Terraneo, Rocco Francesco Rinaldo, Giuseppe Francesco Sferrazza Papa, Fulvia Ribolla, Carlo Gulotta, Laura Maugeri, Emiliano Gatti Stefano Centanni, Fabiano Di Marco

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DISTINCT MECHANICAL PROPERTIES OF THE RESPIRATORY SYSTEM EVALUATED BY FORCED OSCILLATION TECHNIQUE IN ACUTE EXACERBATION OF COPD AND ACUTE DECOMPENSATED HEART FAILURE

Diagnostics 2021,11, 554. <https://doi.org/10.3390/diagnostics11030554>

Claudio Tantucci, Damiano Bottone, Guido Levi, Silvia Uccelli, Nicola Venturoli, Roberto Magri, Emirena Garrafa, Laura Pini

RESPIRATORY FUNCTION, AUTONOMIC DYSFUNCTION, AND SYSTEMIC INFLAMMATION ARE CLOSELY LINKED IN PATIENTS WITH COPD AND TIDAL FLOW LIMITATION: AN EXPLORATORY STUDY

Respiratory Physiology & Neurobiology, Volume 284, February 2021, 103565

Mario Barreto, Melania Evangelisti, Marilisa Montesano, Susy Martella and Maria Pia Villa

PULMONARY FUNCTION TESTING IN ASTHMATIC CHILDREN. TESTS TO ASSESS OUTPATIENTS DURING THE COVID-19 PANDEMIC

Frontiers in pediatrics 2020 - <https://www.frontiersin.org/articles/10.3389/fped.2020.571112/full>

Neeraj Gupta, Anil Sachdev, Dhiren Gupta

OSCILLOMETRY – A REASONABLE OPTION TO MONITOR LUNG FUNCTIONS IN THE ERA OF COVID-19 PANDEMIC

Ped Pulm 2020 - <https://doi.org/10.1002/ppul.25121>

Annika W. M. Goorsenberg, Julia N. S.D' Hooghe Annelies M. Slats, Joost G. van den Aardweg, Jouke T. Annema and Peter I. Bonta

RESISTANCE OF THE RESPIRATORY SYSTEM MEASURED WITH FORCED OSCILLATION TECHNIQUE (FOT) CORRELATES WITH BRONCHIAL THERMOPLASTY RESPONSE

Respiratory Research (2020) 21:52 <https://doi.org/10.1186/s12931-020-1313-6>

ERS 2020 - 05.02 Monitoring airway diseases: **26706**

S. Kostorz-Nosal, D. Jastrzębski, D. Ziora

DIFFERENCES IN FORCED OSCILLATION MEASUREMENTS IN DIFFERENT VENTILATORY DEFECTS

European Respiratory congress 2020, Vienna sept 2020

Sabine C. Zimmermann, Jacqueline Huvanandana, Chinh D. Nguyen, Amy Bertolin, Joanna C. Watts, Alessandro Gobbi, Claude S. Farah, Matthew J. Peters, Raffaele L. Dellacà,

DAY-TO-DAY VARIABILITY OF FORCED OSCILLATORY MECHANICS FOR EARLY DETECTION OF ACUTE EXACERBATIONS IN COPD.

European Respiratory Journal - Eur Respir J 2020; 56: 1901739

Sajal De, Nalok Banerjee, Gagan Deep Singh Kushwah, Dharmendra Dharwey

REGRESSION EQUATIONS OF RESPIRATORY IMPEDANCE OF INDIAN ADULTS MEASURED BY FORCED OSCILLATION TECHNIQUE

Lung India – 2020, Vol 37, Issue 1, Page 30-36

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Ilaria Milesi, Roberto Porta, Luca Barbano, Simona Cacciatore, Michele Vitacca, Raffaele L. Dellacà
AUTOMATIC TAILORING OF THE LOWEST PEEP TO ABOLISH TIDAL EXPIRATORY FLOW LIMITATION IN SEATED AND SUPINE COPD PATIENTS

Respiratory Medicine 155 (2019) 13–18

15th International Conference Advances in Pneumology - October 11-12, 2019, Wuppertal, Germany
THE PATTERN OF CHANGES IN FORCED OSCILLATORY PARAMETERS IN PATIENTS WITH LUNG DISEASES

S. Kostorz-Nosal, S. Rutkowski A. Rutkowska, D. Ziora and D. Jastrzębski

BTS congress 2019

PIGEON FANCIERS WITH NORMAL SPIROMETRY AND NO KNOWN ILD, DISPLAY FORCED OSCILLOMETRY FINDINGS SUGGESTIVE OF SUB-CLINICAL INTERSTITIAL LUNG DISEASE

M Spears, W Henderson, S Dickson, E Johnson, SJ Bourke, B Gooptu, R Allen, LV Wain, C McSharry
Thorax, Volume 74, Issue Suppl 2 - <http://dx.doi.org/10.1136/thorax-2019-BTSabstracts2019.89>

ERS 2019 Thematic Poster Presentation (4810)

ASSOCIATION BETWEEN LONGITUDINAL CHANGES IN RESPIRATORY SYMPTOMS AND LUNG MECHANICS IN COPD

E Zannin, P Walker, P Pompilio, P Calverley, R Dellacà

European Respiratory congress 2019, Madrid, 28 Sept – 2 Oct 2019

ERS 2019 Thematic Poster Presentation (701)

THE ROLE OF R5-19 IN ASSESSING PERIPHERAL AIRWAY OBSTRUCTION

R Ong-Salvador, E Dijkers, R Van Steenwijk

European Respiratory congress 2019, Madrid, 28 Sept – 2 Oct 2019

ERS 2019 Thematic Poster Presentation (4863)

ASSESSMENT OF EXPIRATORY VS INSPIRATORY RESISTANCE AND REACTANCE USING FOT AS A MEASURE OF AIR TRAPPING

A Nasr, L Jarenbäck, L Bjermer, E Tufvesson

European Respiratory congress 2019, Madrid, 28 Sept – 2 Oct 2019

ERS 2019 Thematic Poster Presentation (223)

SHORT TERM INTRA-INDIVIDUAL VARIABILITY OF RESPIRATORY RESISTANCE MEASURED BY FORCED OSCILLATION TECHNIQUE IN HEALTHY ADULTS AND ADULTS WITH OBSTRUCTIVE AIRWAY DISEASES

S De, N Banerjee, G D S Kushwah, D Dharwey

European Respiratory congress 2019, Madrid, 28 Sept – 2 Oct 2019

ERS 2019 Thematic Poster Presentation (4063)

FORCED OSCILLATION TECHNIQUE (FOT) IN THE EVALUATION OF COPD PATIENTS ENROLLED IN PULMONARY REHABILITATION (PR)

I Romagnoli, B Lanini, E Chellini, C Mannini, B Binazzi, E Vulpio, F Gandi, F Gigliotti

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European Respiratory congress 2019, Madrid, 28 Sept – 2 Oct 2019

AIPO 2019 Thematic Poster Presentation – in ITALIAN

TECNICA DELLE OSCILLAZIONI FORZATE: IMPLICAZIONI IN RIABILITAZIONE RESPIRATORIA IN PAZIENTI BPCO

I Romagnoli, B Lanini, E Chellini, B. Binazzi, C Mannini, A. Lazzeri , F Gigliotti

XLV Congresso Nazionale AIPO 2019 – Congresso FIP – 13-16 november, Florence, ITALY

ERS 2019 Thematic Poster Presentation (4946)

NEURAL RESPIRATORY DRIVE AND AIRWAY RESISTANCE IN OBSTRUCTIVE SLEEP APNOEA

E I Schwarz, B He, M Al-Sherif, M Kohler, J Steier

European Respiratory congress 2019, Madrid, 28 Sept – 2 Oct 2019

Sabine C. Zimmermann, Katrina O. Tonga and Cindy Thamrin

DISMANTLING AIRWAY DISEASE WITH THE USE OF NEW PULMONARY FUNCTION INDICES

Eur Respir Rev 2019; 28: 180122

Chris Campbell (Senior Editor, Respiratory Therapy)

SYMPOSIUM EXAMINES OF NON INVASIVE SCREENING OF EXPIRATORY FLOW LIMITATION IN CHRONIC OBSTRUCTIVE PULMONARY DISEASES

Summary review of the supplement on: “ European Respiratory & Pulmonary Diseases SUPPLEMENT, 5 Sept 2018 by Peter Calverley and Raffaele Dellaca

Respiratory Therapy, Vol 14, N.1 – Winter 2019

Peter Calverley and Raffaele Dellaca

NON INVASIVE SCREENING OF EXPIRATORY FLOW LIMITATION IN CHRONIC OBSTRUCTIVE PULMONARY DISEASES-

ERCA-JIVD 3rd Joint International Meeting, Lyon, France, March 2018

European Respiratory & Pulmonary Diseases SUPPLEMENT, publication date: 5 Sept 2018

ERS 2018 Thematic Poster Presentation (1015)

PILOT DATA OF THE SHORT-TERM EFFECTS OF E-CIGARETTE VAPING ON LUNG FUNCTION

J Stockley, E Sapey, S Gompertz, R Edgar, B Cooper

European Respiratory congress 2018, Paris, 15-19 Sept 2018

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ERS 2018 Poster Discussion (1669).

COMPARISON BETWEEN IMPULSE OSCILLOMETRY AND RESMON PRO AND THE USE OF INSPIRATORY PARAMETERS

L Jarenbäck, L Bjermer, E Tufvesson

European Respiratory congress 2018, Paris, 15-19 Sept 2018

Paul P. Walker, Pasquale P. Pompilio, Paolo Zanaboni, Trine S Bergmo, Kaiu Prikk, Andrei Malinovsky, Josep M. Montserrat, Jo Middlemass, Silvana Šonc, Giulia Munaro,, Dorjan Marušič, Ruth Sepper, Roberto Rosso, A. Niroshan Siriwardena, Christer Janson, Ramon Farre', PhD, Peter M.A. Calverley and Raffaele L. Dellaca.

TELEMONITORING IN COPD: THE CHROMED STUDY, A RANDOMIZED CLINICAL TRIAL

Chromed is a clinical research study performed with the home measuring version "Diary" of the Resmon Pro

Am J Respir Crit Care Med 2018 – Vol 198, N.5, 620-628

ARTP 2018 Oral Presentation

THE SHORT-TERM EFFECTS OF E-CIGARETTE VAPING ON LUNG FUNCTION

James.A. Stockley

ARTP – Association for Respiratory Technology and Physiologists, Brighton, UK, 25-26 Jan 2018

ARTP 2018 Poster Presentation:

THE FORCED OSCILLOMETRY TECHNIQUE IS NOT A USEFUL MARKER OF EARLY DISEASE IN ALPHA-1 ANTITRYPSIN DEFICIENCY

J. A. Stockley, B.G. Cooper, R.A. Stockley, E. Sapey

ARTP – Association for Respiratory Technology and Physiologists, Brighton, UK, 25-26 Jan 2018

Or Kalchier-Dekela, Stella E. Hinesa

FORTY YEARS OF REFERENCE VALUES FOR RESPIRATORY SYSTEM IMPEDANCE IN ADULTS: 1977–2017

Respiratory Medicine 136 (2018) 37–47

Roberto "Roby" Perissin

REVIEW: CLINICAL AND TECHNICAL ADVANCES TO THE FORCED OSCILLATORY TECHNIQUE - A LONG ESTABLISHED TECHNIQUE WITH A NEW, NOVEL APPROACH.

Respiratory Therapy, Vol 13, N. 2, Spring 2018 – 28-30

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Bernt Boegvald Aarli, Peter MACalverley, Robert LJensen, Raffaele Dellacà, Tomas MLEagan, Per SBakke, Jon A. Hardie

THE ASSOCIATION OF TIDAL EFL WITH EXERCISE PERFORMANCE, EXACERBATIONS, AND DEATH IN COPD

International Journal of COPD 2017:12 2179–2188

ERS 2017 Poster Presentation

CHANGES IN FORCED OSCILLATION MECHANICS AND SYMPTOMS PRIOR TO COPD EXACERBATIONS DURING HOME TELEMONITORING

Sabine C. Zimmermann, Chinh D. Nguyen, Alessandro Gobbi, Joanna C. Watts, Claude S. Farah, Raffaele L. Dellacà, Matthew J. Peters, Gregory G. King, Cindy Thamrin
European Respiratory congress 2017, Milan, 9-13 Sept 2017

ERS 2016 Poster Presentation

FORCED OSCILLATION TECHNIQUE CAN HIGHLIGHT THE EFFECT OF AIRWAYS CLEARANCE IN COPD

Isabella Romagnoli, E.M Romano, B. Lanini, B. Binazzi, E. Vulpio, A. Lazzeri, C. Castellani, F. Gigliotti
European Respiratory congress 2016, London 3-7 Sept 2016

ERS 2016 Poster Presentation

EFFECTS OF POSTURE AND SLEEP IN RESPIRATORY MECHANICS DETECTED BY FORCED OSCILLATORY TECHNIQUE (FOT)

E. Gatti, L. Maugeri, E. Mellano, R. Dellacà, C. Gulotta
European Respiratory congress 2016, London 3-7 Sept 2016

ATS 2016 Poster Presentation

EXPIRATORY FLOW LIMITATION IS RELATED TO SYMPTOMS AND PREDICTS OUTCOMES OF PULMONARY REHABILITATION IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Sabine C. Zimmermann, Louise Ganderton, Aimee Fraser, Luke Scott, Amy Bertolin, Joanna Watts, Andrew Chan, Cindy Thamrin, Gregory G. King.
Am J Respir Crit Care Med 193;2016:A6353

EPOC 2016 15 Symposium COPD – Barcelona 7-8 April 2016. Oral session.

THE FORCED OSCILLATIONS TECHNIQUE (FOT): IS IT AS USEFUL AS SIMPLE TO PERFORM?

Felip Burgos

ERS 2016 Poster Presentation

IDENTIFICATION OF LUNG MECHANICAL PROPERTIES IN PATIENTS WITH ACUTE EXACERBATION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (AECOPD) OR ACUTE HEART FAILURE (AHF) THROUGH FORCED OSCILLATION TECHNIQUE (FOT): PRELIMINARY RESULTS

AC Reposi, Fabiano DiMarco, Emanuela Rancati, Mirta Cavallini, Fulvia Ribolla, Sara Job, Stefano Centanni

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ERS 2016 Poster Presentation

LUNG FUNCTION ASSESSED BY HOME FORCED OSCILLATION AND SELF REPORTED SYMPTOMS DURING COPD EXACERBATIONS

Pasquale Pio Pompilio, Roberta Macis, Valentina Isetta, Giulia Munaro, Paul Walker, Angelo Paolo Castellani, Mireia Dalmase, Jo Middlemass, A. Niroshan Siriwardena, Paolo Zanaboni, Ruth Sepper, Kaiu Prikk, Andrei Malinoschi, Christer Janson, Dorjan Marušič, Tatjana Dolgan, Raffaele L. Dellaca', Peter M.A. Calverley,

Bernt B. Aarli, Peter M.A. Calverley, Robert L. Jensen, Tomas M.L. Eagan, Per S. Bakke and Jon A. Hardie
VARIABILITY OF WITHIN-BREATH REACTANCE IN COPD PATIENTS AND ITS ASSOCIATION WITH DYSPNOEA

Eur Respir J 2015; 45: 625–634

AIPO Congress 2015 - Poster Presentation

FORCED OSCILLATIONS AND AIRWAYS CLEARANCE TECHNIQUES IN PATIENTS WITH COPD.

Isabella Romagnoli, Elisabetta Maria Romano, Barbara Lanini, Barbara Binazzi, Emanuele Vulpio, Alessio Lazzeri, Carla Castellani, Francesco Gigliotti

AIPO Congress 2015 - Presentation:

IL VERO OBIETTIVO: LA PERIFERIA DEL POLMONE (THE REAL OBJECTIVE: THE LUNG PERIPHERY) (in Italian)

Carlo Gulotta

BTS Conference 2014 Oral Presentation

DIFFERENCES IN FORCED OSCILLATION TECHNIQUE BETWEEN HEALTHY INDIVIDUALS, OBSTRUCTIVE SLEEP APNOEA AND OBESITY HYPOVENTILATION SYNDROME.

S. Mandal , A. Vaughan-France , E. Suh, T. Dhir, P. Pompilio, R. Dellaca, N. Hart

ATS 2014 Poster Presentation

DETECTION OF EXPIRATORY FLOW LIMITATION IN OBESE PATIENTS WITH CHRONIC RESPIRATORY FAILURE.

American Journal of Respiratory and Critical Care Medicine, Vol. 189, Meeting Abstracts, 2014 EFFECTS OF OBESITY ON LUNG FUNCTION, 2014, pp. A3514

Pompilio, P., Suh, E. S., Dellaca, R., Hart, N., & Mandal, S

ATS 2014 Poster Presentation

ABOLITION OF EXPIRATORY FLOW LIMITATION IN SEVERE CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) USING AUTO-TITRATING CONTINUOUS POSITIVE AIRWAY PRESSURE BASED ON THE MEASUREMENT OF WITHIN-BREATH AIRWAY REACTANCE DETERMINED BY THE FORCED OSCILLATION TECHNIQUE.

Suh, E.S., Pompilio, P., Mandal, S., Hill, P., Romano, R., Dellaca, R., Hart, N.

American Journal of Respiratory and Critical Care Medicine, Vol. 189, Meeting Abstracts, 2014, NOVEL AND TRADITIONAL LUNG FUNCTION ASSESSMENT. May 1, 2014, A3555-A3555

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ATS 2014 Poster Presentation

CLINICAL TRIALS FOR ELDERLY PATIENTS WITH MULTIPLE DISEASES (CHROMED): A PILOT STUDY.

*: Chromed is a clinical research study performed with the home measuring version "Diary" of the Resmon Pro
Pasquale Pompilio, Valentina Isetta, Andrei Malinowski, Jo Middlemass, Giulia Munaro, Mireia Dalmasas, Christer Janson, Aloysius Niroshan Siriwardena, Roberta Macis, Paolo Zanaboni, Peter M Calverley, Raffaele Dellaca, Roberto Rosso- on behalf of CHROMED consortium
Eur Respir J 2014; 44: Suppl. 58, P971.

ATS 2014 Poster Discussion.

DETECTION OF FLOW LIMITATION IN COPD PATIENTS USING TWO DIFFERENT FORCED OSCILLATION DEVICES.

K. De Soomer, A. M. Vints, R. Heyndrickx, L. Claus, W. De Backer, E. Oostveen
Eur Respir J 2014; 44

SIMG Congress 2014 (**ITALIAN GENERAL PRACTITIONERS NATIONAL CONGRESS**) SCREENING DI PATOLOGIE OSTRUTTIVE RESPIRATORIE PRESSO GLI STUDI DI MEDICINA GENERALE: IL POSSIBILE RUOLO DELLA TECNICA DELLE OSCILLAZIONI FORZATE (FOT). / **SCREENING OF OBSTRUCTIVE RESPIRATORY DISEASES IN GENERAL PRACTITIONERS OFFICES: POSSIBLE ROLE OF FORCED OSCILLATION TECHNIQUE (FOT).**

Calzolari M., Nardi R., Colombo F., Marelli M, Pompilio P, Macis R. , Gobbi A , Dellacà R.L.

Antonelli, A., Crimi, E., Gobbi, A., Torchio, R., Gulotta, C., Scano, G., ... Pellegrino, R. (2013).

MECHANICAL CORRELATES OF DYSPNEA IN BRONCHIAL ASTHMA.

Physiological Reports 1–11.

Claudio Tantucci (2013)

EXPIRATORY FLOW LIMITATION DEFINITION, MECHANISMS, METHODS AND SIGNIFICANCE.

Pulmonary Medicine, Vol.2013, Article ID 749860, 6 pages.

N. Koulouris, G. Kaltsakas, A. Palamidis, S.A. Gennimata.(2012)

METHODS FOR ASSESSING EXPIRATORY FLOW LIMITATION DURING TIDAL BREATHING IN COPD PATIENTS.

Pulmonary Medicine, Vol. 2012, Article ID 234145, 8 pages.

Dellacà, R. L., Pompilio, P. P., Walker, P. P., Duffy, N., Pedotti, a, & Calverley, P. M. a. (2009).

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ASTHMA, ADULT AND PEDIATRICS

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IMPEDANCE AND SPIROMETRY MEASUREMENTS COMPARED IN PAEDIATRIC OUTPATIENTS WITH RECURRENT RESPIRATORY SYMPTOMS.

M. C. Mazzuca, G. Raponi, S. Mascambroni, C. Trovato, M. Evangelisti, M. A. Valderrama, P. Parisi, M. Barreto

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SPIROMETRY PARAMETERS VERSUS FORCED OSCILLOMETRY PARAMETERS IN OBSTRUCTIVE AIRWAY DISEASE – IS THERE A CORRELATION?

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EFFECT OF BREATHING PATTERN ON AIRWAYS RESISTANCE AND REACTANCE USING FORCED OSCILLATORY TECHNIQUE (FOT)

M. Howlett-Foster, E. O' Neill, Karl Sylvester

ARTP – Association for Respiratory Technology and Physiologists, Brighton, UK, 16-18 March, 2023

Salvatore Fasola, Giovanna Cilluffo, Velia Malizia, Enrico Lombardi, Alessandro Gobbi, Claudia Calogero, Grazia Fenu, Giuliana Ferrante, Laura Montalbano, Stefania La Grutta

EQUAZIONI DI RIFERIMENTO DEVICE-SPECIFICHE PER LA PREDIZIONE DEI VALORI NORMALI DEI PARAMETRI DI OSCILLOMETRIA FORZATA NEI BAMBINI (IN ITALIAN, ENGLISH SUMMARY) DEVICE-SPECIFIC REFERENCE EQUATIONS FOR THE PREDICTION OF NORMAL PARAMETERS OF FORCED OSCILLATION IN CHILDREN.

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FORCED OSCILLATION: A NEW WAY TO IMPROVE THE MANAGEMENT OF CHILDREN WITH TRACHEOMALACIA BY MEASURING AIRWAY OBSTRUCTION AND PARADOXICAL RESPONSE TO SALBUTAMOL

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ERS 2022 Poster Presentation (Session 282 – OA2304) :

RESPIRATORY IMPEDANCE REFERENCE VALUES IN CHILDREN AND ADOLESCENTS: THE AUSTRIAN LEAD STUDY

P Christoph Valach (Vienna, Austria), Emiel F. M. Wouters, Alina Ofenheimer, Patricia Puchhammer, Pasquale P. Pompilio,

Alessandro Gobbi, Marie K. Breyer, Sylvia Hartl, Otto C. Burghuber, Robab Breyer-Kohansal
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EFFECT OF DIFFERENT STIMULATING WAVEFORMS ON THE DERIVATION OF OSCILLOMETRY SPECTRAL PARAMETERS IN ASTHMATIC CHILDREN

P.P. Pompilio, G. Ferrante, A.Gobbi, L Venditto, M. Piazza, R. Dellaca', G. Piacentini

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STUDIO DELL' IMPEDENZA RESPIRATORIA MEDIANTE TECNICA FOT (FORCED OSCILLATION TECHNIQUE) IN BAMBINI ASMATICI

IN ITALIAN : EVALUATION OF RESPIRATORY IMPEDANCE WITH FOT (FORCED OSCILLATION TECHNIQUE) IN ASTHMATIC CHILDREN

Laura Tenero, Laura Venditta, Giuliana Ferrante, Michele Piazza, Pasquale Pio Pompilio, Alessandro Gobbi, Raffaele Dellaca, Giorgio Placentini

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L. Reyes, W. De Jesus-Rojas

American Journal of Respiratory and Critical Care Medicine, ATS Meeting Abstracts, 2022 – A65
PULMONARY CLINICAL CASES II / Thematic Poster Session / Sunday, May 15/09:30 AM-03:45 PM

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ASSESSMENT OF BRONCHIECTASIS BY IMPULSE OSCILLOMETRY IN PRIMARY CILIARY DYSKINESIA

P. M. Quiles Ruiz De Porras¹, W. De Jesus-Rojas²

American Journal of Respiratory and Critical Care Medicine, ATS Meeting Abstracts, 2022 – A66
PHYSIOLOGIC STUDIES OF LUNG FUNCTION / Thematic Poster Session / Sunday, May 15/09:30 AM-03:45 PM

Esther S. Veldhoen,, Johan H. Roos, Rolien Bekkema, W. Ludo van der Pol, Marcel H.B. Tinnevelt, Laura P. Verweij-van den Oudenrijn, Roelie M. Wösten-van Asperen, Erik H.J. Hulzebos, Camiel A. Wijngaarde, C. Kors van der Ent,

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F Lucca, M Piazza, L Tenero, E Bonetti, S Cesaro, G Piacentini

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H Johansson, K Alving, M Emtner, C Janson, L Nordang, P Pio Pompilio, A Malinowski

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A Nasr, K Romberg, U Nihlen, L Karlsson, E Tufvesson, L Bjermer, L Jarenbäck

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FORCED OSCILLATION TECHNIQUE AS USEFUL METHOD TO MONITOR THE EFFICACY OF MEPOLIZUMAB IN TREATING SEVERE EOSINOPHILIC ASTHMA

Tontini C., Marchionni A., Gobbi A., Gallifuoco M., Lucchetti B., Garritani M. S., Bilò M. B., Antonicelli L.

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SIMRI 2018 – 27-29 September 2018, Pisa, Italy

Chris Campbell (Senior Editor, Respiratory Therapy)

THE BENEFITS OF FORCED OSCILLATION TECHNIQUE (FOT) AS A TOOL FOR ASTHMA DIAGNOSIS

Summary review of the publication: “ C. Heijkenskjöld Rentzhog, C. Janson, L. Berglund, M. P. Borres, L. Nordvall, K. Alving and A. Malinoschi **OVERALL AND PERIPHERAL LUNG FUNCTION ASSESSMENT BY SPIROMETRY AND FORCED OSCILLATION TECHNIQUE IN RELATION TO ASTHMA DIAGNOSIS AND CONTROL**

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E Lauhkonen, S Sivagnanasithiyar, G Kaltsakas, R Iles

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A W Goorsenberg, J N D’Hooghe, A M Slats, J G Van Den Aardweg, J T Annema, P I Bonta

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ERS 2018 Thematic Poster Presentation (4711): **CHANGE OF LUNG FUNCTION IN SEVERE EOSINOPHILIC ASTHMA UNDERGOING TREATMENT WITH ANTI-INTERLEUKIN-5 MONOCLONAL ANTIBODY**

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R O Salvador¹, E Dijkers¹, P Sterk², R van Steenwijk²
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ATS 2016 Oral Presentation: **BREATH-TO-BREATH AND DAY-TO-DAY VARIABILITY OF RESPIRATORY IMPEDANCE IN ASTHMA PATIENTS**

Chinh D. Nguyen, Alessandro Gobbi, Raffaele L. Dellaca, Gregory G. King, Cindy Thamrin
Am J Respir Crit Care Med 193;2016:A4592

ERS 2016 Poster Presentation: **CHANGES IN INSPIRATORY RESISTANCE AFTER EXERCISE CHALLENGE RELATE TO SUBCLINICAL AIRWAYS INFLAMMATION IN ADOLESCENTS WITHOUT FEV1-FALL**

Henrik Johansson, Pasquale Pompilio, Margareta Emtner, Raffaele Dellaca, Andrei Malinovschi

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ATS 2014 Poster Presentation: **INSPIRATORY AND EXPIRATORY AIRWAYS RESISTANCE IN RELATION TO EXERCISE-INDUCED BRONCHOCONSTRICTION (EIB) AND AIRWAYS INFLAMMATION.**

Johansson H, Pompilio PP, Emtner M, Dellacà RL, Malinowski A.
Eur Respir J 2014; 44: Suppl. 58, P3967.

ATS 2014 Poster Presentation: **DAY-BY-DAY VARIABILITY OF INSPIRATORY RESISTANCE: A NOVEL TEST FOR THE DIAGNOSIS OF ASTHMA.**

Gobbi A, Gulotta C, Mellano E, Suki B, Dellacà R.
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ERS 2013, Poster Discussion: **CLOSING VOLUME DETECTION BY SINGLE BREATH NITROGEN WASHOUT AND FORCED OSCILLATION TECHNIQUE**

Chiara Veneroni, Alain Van Muylem, Andrei Malinowski, Raffaele Lorenzo, Raffaele L. Dellacà, Alain Michils,
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Andrei Malinowski, Chiara Veneroni, Alain Van Muylem, Alain Michils, Raffaele L. Dellacà
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C. Gulotta, M.D. , B. Suki Ph.D. , V. Brusasco M.D. , R. Pellegrino M.D. , A. Gobbi Ph.D. , A. Pedotti Ph.D. , and R. L. Dellacà Ph.D.(2012) **MONITORING THE TEMPORAL CHANGES OF RESPIRATORY RESISTANCE: A NOVEL TEST FOR THE MANAGEMENT OF ASTHMA.**

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R. Torchio, A. Gobbi, C. Gulotta, R. Dellacà, M. Tinivella, R. E. Hyatt, V. Brusasco, and R. Pellegrino (2009)

MECHANICAL EFFECTS OF OBESITY ON AIRWAY RESPONSIVENESS IN OTHERWISE HEALTHY HUMANS.

Journal of Applied Physiology 2009, 107, 408-416.

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CYSTIC FIBROSIS, INTERSTITIAL LUNG DISEASES

Fouzas S, Kogias C, Gioulvanidou M, et al.

LOW-FREQUENCY OSCILLOMETRY INDICES TO ASSESS VENTILATION INHOMOGENEITY IN CF PATIENTS.

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Matesanz-lópez C, Raboso-moreno B, Salda LE, Rodríguez-nieto MJ, Río-ramírez MT. Is **LUNG FUNCTION MEASURED BY OSCILLOMETRY USEFUL IN INTERSTITIAL LUNG DISEASE?**

2023;(xxxx):1-5. doi:10.1016/j.opresp.2023.100278

Elliot Wallaert, Thierry Perez, Anne Prevotat, Gregory Reychler, Benoit Wallaert*, Olivier Le Rouzic
THE IMMEDIATE EFFECTS OF A SINGLE AUTOGENIC DRAINAGE SESSION ON VENTILATORY MECHANICS IN ADULT SUBJECTS WITH CYSTIC FIBROSIS

PLOS ONE - <https://doi.org/10.1371/journal.pone.0195154> March 29, 2018

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VENTILATION, HOME MONITORING IN ASTHMA & COPD, **MISCELLANEOUS EFL**

ARTP 2023 Poster Presentation:

THE EFFECT OF BREATHING PATTERN ON AIRWAY RESISTANCE AND REACTANCE USING FORCED OSCILLATION TECHNIQUE (FOT)

M. Howlett-Foster, E. O'Neill, K, Sylvester

Association for Respiratory Technology & Physiology Annual Conference 2023, 16-17 March, 2023, Brighton, UK.

Lippi, L., Turco, A., Folli, A. *et al.*

Technological advances and digital solutions to improve quality of life in older adults with chronic obstructive pulmonary disease: a systematic review

Aging Clin Exp Res **35**, 953–968 (2023). <https://doi.org/10.1007/s40520-023-02381-3>

Rosemijne R W P Pigmans, Ruud W van Leutenen, Anouk W J Scholten, Chiara Veneroni, Anton H van Kaam, Jeroen Hutten, Raffaele L Dellacà and Frans H C de Jongh

INFLUENCE OF NEONATAL ENDOTRACHEAL TUBE DIMENSIONS ON OSCILLOMETRY-ACQUIRED REACTANCE: A BENCH STUDY

Physiological Measurement, Volume 44, Number 1, 2023, DOI 10.1088/1361-6579/acb03a

Emanuela Zannin PhD, Camilla Rigotti PhD, Roland P. Neumann PhD, Raffaele L. Dellacà, Sven Schulzke, Maria L. Ventura MD

OSCILLATORY MECHANICS IN VERY PRETERM INFANTS ON CONTINUOUS POSITIVE AIRWAY PRESSURE SUPPORT: REFERENCE VALUES

Pediatric Pulmonology 2022, 23 November 2022, <https://doi.org/10.1002/ppul.26247>

ERS 2022 Poster Presentation (Session 381 – PA3186) :

ACCURACY OF IMPEDANCE MEASUREMENTS OF A NOVEL HANDHELD OSCILLOMETRY DEVICE

Davide Bizzotto (Milano (MI), Italy), Pasquale Pio Pompilio, Alessandro Gobbi, Raffaele Dellacà' European Respiratory congress 2022, Barcelona, Spain, 4-7 Sept

Emanuela Zannin, Ilaria Milesi, Roberto Porta, Simona Cacciatore, Luca Barbano, R Trentin, Francesco Fanfulla, Michele Vitacca and Raffaele L Dellacà

ASSESSMENT OF BRONCHODILATOR RESPONSE BY FORCED OSCILLATION TECHNIQUE IN A PRETERM INFANT WITH EVOLVING BRONCHOPULMONARY DYSPLASIA: A CASE REPORT

Pediatric Pulmonology 2022, Volume 57, Issue 4, April 2022, Pages 1092-1095

ATS 2022 Poster Presentation:

IN-VITRO VALIDATION OF A NOVEL HANDHELD OSCILLOMETRY DEVICE

D. Bizzotto, P. P. Pompilio, A. Gobbi, R. L. Dellacà

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American Journal of Respiratory and Critical Care Medicine, ATS Meeting Abstracts, 2022 –
Presentation A5661 / P1049

Emanuela Zannin, Ilaria Milesi, Roberto Porta, Simona Cacciatore, Luca Barbano, R Trentin,
Francesco Fanfulla, Michele Vitacca and Raffaele L Dellacà

EFFECT OF NOCTURNAL EPAP TITRATION TO ABOLISH TIDAL EXPIRATORY FLOW LIMITATION IN COPD PATIENTS WITH CHRONIC HYPERCAPNIA

Respiratory Therapy Vol. 16 No. 1 n Winter 2021

Claudio Tantucci, Damiano Bottone, Guido Levi, Silvia Uccelli, Nicola Venturoli, Roberto Magri,
Emirena Garrafa, Laura Pini

RESPIRATORY FUNCTION, AUTONOMIC DYSFUNCTION, AND SYSTEMIC INFLAMMATION ARE CLOSELY LINKED IN PATIENTS WITH COPD AND TIDAL FLOW LIMITATION: AN EXPLORATORY STUDY

Respiratory Physiology & Neurobiology, Volume 284, February 2021, 103565

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Robert Romano , John Moxham, Raffaele Dellaca and Nicholas Hart (2020).

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Ilaria Milesi, Roberto Porta, Luca Barbano, Simona Cacciatorea, Michele Vitacca, Raffaele L. Dellacà,
AUTOMATIC TAILORING OF THE LOWEST PEEP TO ABOLISH TIDAL EXPIRATORY FLOW LIMITATION IN SEATED AND SUPINE COPD PATIENTS

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ERS 2019 Thematic Poster Presentation (4810): **ASSOCIATION BETWEEN LONGITUDINAL CHANGES IN RESPIRATORY SYMPTOMS AND LUNG MECHANICS IN COPD**

E Zannin, P Walker, P Pompilio, P Calverley, R Dellacà

European Respiratory congress 2019, Madrid, 28 Sept – 2 Oct 2019

ERS 2019 Thematic Poster Presentation (4863): **TEMPORAL VARIABILITY OF FORCED OSCILLOMETRY FROM HOME TELEMONITORING AND RELATIONSHIP WITH PATIENT-CENTRED OUTCOMES AND AECOPD**

S Zimmermann, J Huvanandana, C Nguyen, A Gobbi, C Farah, M Peters, R Dellaca, G King, C Thamrin

European Respiratory congress 2019, Madrid, 28 Sept – 2 Oct 2019

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Emanuela Zannin, Biswajit Chakrabarti, Leonardo Govoni, Pasquale P. Pompilio, Robert Romano, Peter M.A. Calverley and Raffaele L. Dellacà'

DETECTION OF EXPIRATORY FLOW LIMITATION BY FORCED OSCILLATIONS DURING NON-INVASIVE VENTILATION

AJRCCM Articles in Press. Published on 26-June-2019 as 10.1164/rccm.201903-0570LE

Paul P. Walker, Pasquale P. Pompilio, Paolo Zanaboni, Trine S Bergmo, Kaiu Prikk, Andrei Malinovsky, Josep M. Montserrat, Jo Middlemass, Silvana Šonc, Giulia Munaro,, Dorjan Marušič, Ruth Sepper, Roberto Rosso, A. Niroshan Siriwardena, Christer Janson, Ramon Farre', PhD, Peter M.A. Calverley and Raffaele L. Dellacà.

TELEMONITORING IN COPD: THE CHROMED STUDY, A RANDOMIZED CLINICAL TRIAL

*: Chromed is a clinical research study performed with the home measuring version "Diary" of the Resmon Pro

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THE ASSOCIATION OF TIDAL EFL WITH EXERCISE PERFORMANCE, EXACERBATIONS, AND DEATH IN COPD

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ERS 2017 Poster Presentation: **CHANGES IN FORCED OSCILLATION MECHANICS AND SYMPTOMS PRIOR TO COPD EXACERBATIONS DURING HOME TELEMONITORING**

Sabine C. Zimmermann, Chinh D. Nguyen, Alessandro Gobbi, Joanna C. Watts, Claude S. Farah, Raffaele L. Dellacà, Matthew J. Peters, Gregory G. King, Cindy Thamrin

European Respiratory congress 2017, Milan, 9-13 Sept 2017

ERS 2016 Oral Presentation: **RANDOMIZED CONTROLLED TRIAL OF TELEMONITORING WITH ADDITION OF DAILY FORCED OSCILLATORY TECHNIQUE IN OLDER PEOPLE WITH COPD AND CO-MORBIDITY (THE CHROMED* STUDY)**

*: Chromed is a clinical research study performed with the home measuring version "Diary" of the Resmon Pro

P. Pompilio, P. Zanaboni, T. Bergo, T Grzetic Romcevic, V. Isetta, C. Janson, A. Malinoschi, D. Marusic, J. Middlemass, J. Monserrat, G. Munaro, K. Prikk, R. Sepper, N. Siriwardena, P. Calverley, R. Dellacà', R. Rosso, PP. Walker

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ATS 2016 Poster Presentation: **EXPIRATORY FLOW LIMITATION IS RELATED TO SYMPTOMS AND PREDICTS OUTCOMES OF PULMONARY REHABILITATION IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE**

Sabine C. Zimmermann, Louise Ganderton, Aimee Fraser, Luke Scott, Amy Bertolin, Joanna Watts,

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Andrew Chan, Cindy Thamrin, Gregory G. King.
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American Journal of Respiratory and Critical Care Medicine, Vol. 189, Meeting Abstracts, 2014 EFFECTS OF OBESITY ON LUNG FUNCTION, 2014, pp. A3514

ATS 2014 Poster Presentation: **ABOLITION OF EXPIRATORY FLOW LIMITATION IN SEVERE CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) USING AUTO-TITRATING CONTINUOUS POSITIVE AIRWAY PRESSURE BASED ON THE MEASUREMENT OF WITHIN-BREATH AIRWAY REACTANCE DETERMINED BY THE FORCED OSCILLATION TECHNIQUE.**

Suh, E.S., Pompilio, P., Mandal, S., Hill, P., Romano, R., Dellaca, R., Hart, N.
American Journal of Respiratory and Critical Care Medicine, Vol. 189, Meeting Abstracts, 2014, NOVEL AND TRADITIONAL LUNG FUNCTION ASSESSMENT. May 1, 2014, A3555-A3555

ATS 2014 Poster Presentation: **CLINICAL TRIALS FOR ELDERLY PATIENTS WITH MULTIPLE DISEASES (CHROMED): A PILOT STUDY.**

*: Chromed is a clinical research study performed with the home measuring version "Diary" of the Resmon Pro
Pasquale Pompilio, Valentina Isetta, Andrei Malinovski, Jo Middlemass, Giulia Munaro, Mireia Dalmasas, Christer Janson, Aloysius Niroshan Siriwardena, Roberta Macis, Paolo Zanaboni, Peter M Calverley, Raffaele Dellaca, Roberto Rosso- on behalf of CHROMED consortium
Eur Respir J 2014; 44: Suppl. 58, P971.

ATS 2014 Poster Discussion: **DETECTION OF FLOW LIMITATION IN COPD PATIENTS USING TWO DIFFERENT FORCED OSCILLATION DEVICES.**

K. De Soomer, A. M. Vints, R. Heyndrickx, L. Claus, W. De Backer, E. Oostveen.
Eur Respir J 2014; 44

COPD 9th Conference 2014 Poster Presentation: **ACCEPTABILITY OF A NOVEL TELEMONITORING SYSTEM FOR ELDERLY PEOPLE WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE AND COMORBIDITIES: THE CHROMED CLINICAL TRIAL, PRELIMINARY RESULTS.**

*: Chromed is a clinical research study performed with the home measuring version "Diary" of the Resmon Pro
Pasquale Pompilio, Valentina Isetta, Andrei Malinovski, Jo Middlemass, Giulia Munaro, Mireia Dalmasas, Christer Janson, Aloysius Niroshan Siriwardena, Roberta Macis, Paolo Zanaboni, Peter M Calverley, Raffaele Dellaca, Roberto Rosso- on behalf of CHROMED consortium .

National SAPC Congress 2014: **CLINICAL TRIALS FOR ELDERLY PATIENTS WITH MULTIPLE DISEASES (CHROMED) PILOT STUDY.**

*: Chromed is a clinical research study performed with the home measuring version "Diary" of the Resmon Pro
Pasquale Pompilio, Valentina Isetta, Andrei Malinovski, Jo Middlemass, Giulia Munaro, Mireia Dalmasas, Christer Janson, Aloysius Niroshan Siriwardena, Roberta Macis, Paolo Zanaboni, Peter M Calverley, Raffaele Dellaca, Roberto Rosso- on behalf of CHROMED consortium

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Claudio Tantucci (2013)

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Dellacà, R. L., Pompilio, P. P., Walker, P. P., Duffy, N., Pedotti, a, & Calverley, P. M. a. (2009).

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The European Respiratory Journal, 33(6), 1329–37.

Farre, R., & Navajas, D. (2004).

ASSESSMENT OF EXPIRATORY FLOW LIMITATION IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A NEW APPROACH.

2004 - European Respiratory Journal, 23(2), 187–188.

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DETECTION OF EXPIRATORY FLOW LIMITATION IN COPD USING THE FORCED OSCILLATION TECHNIQUE.

2004 - European Respiratory Journal, 24(2), 332–333

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RESEARCH, OTHER USES, PHYSIOLOGY

ERS 2022 Poster Presentation (Session 375 – OA3115) :

DIAGNOSTIC POTENTIAL OF FORCED OSCILLOMETRY TECHNIQUE IN ADULTS WITH NORMAL SPIROMETRY:

DATA FROM THE LEAD GENERAL POPULATION COHORT

Christoph Valach (Vienna, Austria), Chiara Veneroni, Emiel Wouters, Alessandro Gobbi, Raffaele Dellaca', Marie-Kathrin Breyer, Sylvia Hartl, Owat Sunanta, Pasquale Pompilio, Robab Breyer-Kohansal
European Respiratory congress 2022, Barcelona, Spain, 4-7 Sept

Antonio Gilardi, Maria Carolina Colucci, Andrea Colizza, Mario Barreto, Antonio Minni, Massimo Ralli, Antonio Greco, Pasquale Parisi, Marco de Vincentiis

OSCILLOMETRY IN TOTAL LARYNGECTOMIZED PATIENTS: A CASE STUDY

Science Progress 2022, Vol. 105(3) 1–6

ERS 2022 Poster Presentation (Session 70 – PA237) :

REFERENCE VALUES FOR RESPIRATORY IMPEDANCE IN ADULT MEN AND WOMEN: DATA FROM THE AUSTRIAN LEAD STUDY.

Christoph Valach (Vienna, Austria), Emiel F. M. Wouters, Alina Ofenheimer, Patricia Puchhammer, Pasquale P. Pompilio, Alessandro Gobbi, Marie K. Breyer, Sylvia Hartl, Otto C. Burghuber, Robab Breyer-Kohansal

European Respiratory congress 2022, Barcelona, Spain, 4-7 Sept

Luca Stucchi, , Francesco Ferrucci, Michela Bullone, Raffaele L Dellacà and Jean Pierre Lavoie
Within-Breath Oscillatory Mechanics in Horses Affected by Severe Equine Asthma in Exacerbation and in Remission of the Disease

Animals **2022**, 12(1), 4; <https://doi.org/10.3390/ani12010004>

Emanuela Zannin, Camilla Rigotti, Roland P. Neumann, Raffaele L. Dellacà, Sven Schulzke, Maria Luisa Ventura

OSCILLATORY MECHANICS AT 36 WEEKS POST-MENSTRUAL AGE AS MARKERS OF LUNG DISEASE IN PRETERM INFANTS: A COHORT STUDY

Eur Respir J 2022; 59: 2103023

Davide Bizzotto, Stefano Paganini, Luca Stucchi, Matteo Palmisano Avallone, Esther Millares Ramirez, Pasquale P Pompilio, Francesco Ferrucci, Jean-Pierre Lavoie and Raffaele L Dellacà

A PORTABLE FAN-BASED DEVICE FOR EVALUATING LUNG FUNCTION IN HORSES BY THE FORCED OSCILLATION TECHNIQUE

Physiological Measurement, Volume 43, Number 2, 2022

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Chiara Veneroni, Andrea Acciarito, Enrico Lombardi, Gianluca Imeri, David A. Kaminsky, Alessandro Gobbi, Pasquale P. Pompilio, Raffaele L. Dellaca'

USE OF ARTIFICIAL INTELLIGENCE FOR IMPROVING QUALITY CONTROL OF OSCILLOMETRY

Computers in biology and medicine, Volume 138, November 2021, 104871 -

<https://doi.org/10.1016/j.combiomed.2021.104871>

Annika W. M. Goorsenberg, Julia N. S. D' Hooghe Annelies M. Slats, Joost G. van den Aardweg, Jouke T. Annema and Peter I. Bonta

RESISTANCE OF THE RESPIRATORY SYSTEM MEASURED WITH FORCED OSCILLATION TECHNIQUE (FOT) CORRELATES WITH BRONCHIAL THERMOPLASTY RESPONSE

Respiratory Research (2020) 21:52 <https://doi.org/10.1186/s12931-020-1313-6>

BTS congress 2019

PIGEON FANCIERS WITH NORMAL SPIROMETRY AND NO KNOWN ILD, DISPLAY FORCED OSCILLOMETRY FINDINGS SUGGESTIVE OF SUB-CLINICAL INTERSTITIAL LUNG DISEASE

M Spears, W Henderson, S Dickson, E Johnson, SJ Bourke, B Goptu, R Allen, LV Wain, C McSharry
Thorax, Volume 74, Issue Suppl 2 - <http://dx.doi.org/10.1136/thorax-2019-BTSabstracts2019.89>

Ronald J. Dandurand, Jean-Pierre Lavoie, Larry C. Lands, Zoltán Hantos and the Oscillometry Harmonisation Study Group

COMPARISON OF OSCILLOMETRY DEVICES USING ACTIVE MECHANICAL TEST LOADS

ERJ Open Research 2019 5: 00160-2019; DOI: 10.1183/23120541.00160-2019

ERS 2018 Thematic Poster Presentation (2210)

INFLUENCE OF AN ULTRAENDURANCE EVENT ON LUNG HEALTH

C Wheatley, G Stewart, C Fermoye, B Ziegler, B Johnson

European Respiratory congress 2018, Paris, 15-19 Sept 2018

Sabine C. Zimmermann, Joanna C. Watts, Amy Bertolin, Kanika Jetmalani, Gregory G. King, Cindy Thamrin (2017). **DISCREPANCY BETWEEN IN VIVO AND IN VITRO COMPARISONS OF FORCED OSCILLATION DEVICES.**

J Clin Monit Comput DOI 10.1007/s10877-017-0050-y.

ERS 2018 Thematic Poster Presentation (4169): **LONGITUDINAL ASSESSMENT OF LUNG FUNCTION IN PATIENTS WITH PECTUS EXCAVATUM (PE)**

D Trachsel, E Zannin, R Dellacà, F M Haecker, T De Trey

European Respiratory congress 2018, Paris, 15-19 Sept 2018

ATS 2016 Poster Presentation: **NO EFFECT OF THE MEASUREMENT DURATION ON THE WITHIN-SESSION REPEATABILITY OF RESPIRATORY IMPEDANCE IN ADULTS**

Ellie Oostveen, Karla Leemans, Wilfried De Backer, Kevin De Soomer. Am J Respir Crit Care Med 193;2016:A6355

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G. Barisione , A. Bacigalupo, C. Brusasco, C. Scanarotti, S. Penco, A. M. Bassi, T. Lamparelli, A. Garlaschi, R. Pellegrino, V. Brusasco (2014)

MECHANISMS FOR REDUCED PULMONARY DIFFUSING CAPACITY IN HAEMATOPOIETIC STEM-CELL TRANSPLANTATION RECIPIENTS.

Respiratory Physiology & Neurobiology 2014 194, 54–61

ATS 2014 Poster Discussion: **INSTRUMENT VARIABILITY IN THE MEASUREMENT OF RESPIRATORY RESISTANCE.**

E. Oostveen, K. De Soomer, J. A. Otte, A. M. Vints, W. De Backer.

Eur Respir J 2014; 44(58), P1823.

G. Barisione, P. P. Pompilio , A. Bacigalupo, C. Brusasco , A. Cioè , R. L. Dellacà, T. Lamparelli, A. Garlaschi , R. Pellegrino , V. Brusasco (2012).

AIRWAY DISTENSIBILITY WITH LUNG INFLATION AFTER ALLOGENEIC HAEMATOPOIETIC STEM-CELL TRANSPLANTATION.

2012 Respiratory Physiology & Neurobiology, 184(1), 80–85

S.Baldi, R. Dellacà, L Govoni, R. Torchio, A. Aliverti, P. Pompilio, L Corda, C Tantucci, C. Gulotta, V Brusasco, R. Pellegrino (2010)

AIRWAY DISTENSIBILITY AND VOLUME RECRUITMENT WITH LUNG INFLATION IN COPD.

J Appl Physiol 109: 1019–1026, 2010

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REFERENCE EQUATIONS USED IN THE RESMON PRO FULL V3:

PEDIATRICS:

3-17 years of age:

Francine M. Ducharme, Anna Smyrnova, Christiane C. Lawson, Laura May Miles

REFERENCE VALUES FOR RESPIRATORY SINUSOIDAL OSCILLOMETRY IN CHILDREN AGED 3 TO 17 YEARS

Ped Pulm 2022 – May 2022 – Pediatric Pulmonology. 2022;1–11.

2-13 years of age:

Claudia Calogero, MD, Shannon J. Simpson, PhD, Enrico Lombardi, MD, Niccolo` Parri, MD, Barbara Cuomo, MD, Massimo Palumbo, MD, Maurizio de Martino, MD, Claire Shackleton, BSc (Hons), Maureen Verheggen, MMedSc, Tania Gavidia, MIH, Peter J. Franklin, PhD, Merci M.H. Kusel, MBBS, PhD, Judy Park, MBiostat, Peter D. Sly, DSc, and Graham L Hall, PhD

RESPIRATORY IMPEDANCE AND BRONCHODILATOR RESPONSIVENESS IN HEALTHY CHILDREN AGED 2–13 YEARS.

Pediatric Pulmonology 48:707–715(2013)

2-7 years of age:

Calogero, C., Parri, N., Baccini, a, Cuomo, B., Palumbo, M., Novembre, E., ... Lombardi, E. (2010).

RESPIRATORY IMPEDANCE AND BRONCHODILATOR RESPONSE IN HEALTHY ITALIAN PRESCHOOL CHILDREN.

Pediatric Pulmonology, 45(11), 1086–94.

7-17 YEARS OLD:

Ducharme, F. M., Davis, G. M., & Ducharme, G. R. (1998).

PEDIATRIC REFERENCE VALUES FOR RESPIRATORY RESISTANCE MEASURED BY FORCED OSCILLATION.

Chest, 113(5), 1322–8.

5-17 YEARS OLD:

Sajal De, Nalok Banerjee & R. R. Tiwari -

REGRESSION EQUATIONS OF RESPIRATORY IMPEDANCE MEASURED BY FORCED OSCILLATION TECHNIQUE FOR INDIAN CHILDREN,

Indian Journal of Pediatrics, 2019 - <https://doi.org/10.1007/s12098-019-03116-x>

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ADULTS:

Oostveen, E., Boda, K., van der Grinten, C. P. M., James, A. L., Young, S., Nieland, H., & Hantos, Z. (2013).

RESPIRATORY IMPEDANCE IN HEALTHY SUBJECTS: BASELINE VALUES AND BRONCHODILATOR RESPONSE. The European Respiratory Journal: Official Journal of the European Society for Clinical Respiratory Physiology

Sajal De, Nalok Banerjee, Gagan Deep Singh Kushwah, Dharmendra Dharwey -

REGRESSION EQUATIONS OF RESPIRATORY IMPEDANCE OF INDIAN ADULTS MEASURED BY FORCED OSCILLATION TECHNIQUE

Lung India – 2020, Vol 37, Issue 1, Page 30-36

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GUIDELINES, STANDARDS AND SUGGESTED READING

Kaminsky DA, Simpson SJ, Berger KI, et al.

CLINICAL SIGNIFICANCE AND APPLICATIONS OF OSCILLOMETRY.

Eur Respir Rev. 2022;31(163):1-19. doi:10.1183/16000617.0208-2021

“We briefly review the physiological principles of oscillometry and the basics of oscillometry interpretation, and then describe what is currently known about oscillometry in its role as a sensitive measure of airway resistance, bronchodilator responsiveness and bronchial challenge testing, and response to medical therapy, particularly in asthma and COPD. The technique may have unique advantages in situations where spirometry and other lung function tests are not suitable, such as in infants, neuromuscular disease, sleep apnoea and critical care. Other potential applications include detection of bronchiolitis obliterans, vocal cord dysfunction and the effects of environmental exposures.”

Gregory G. King, Jason Bates, Kenneth I. Berger, Peter Calverley, Pedro L. de Melo, Raffaele L. Dellacà, Ramon Farré, Graham L. Hall, Iulia Ioan, Charles G. Irvin, David W. Kaczka, David A. Kaminsky, Hajime Kurosawa, Enrico Lombardi, Geoffrey N. Maksym, François Marchal, Beno W. Oppenheimer, Shannon J. Simpson, Cindy Thamrin, Maarten van den Berge and Ellie Oostveen

TECHNICAL STANDARDS FOR RESPIRATORY OSCILLOMETRY.

European Respiratory Journal, 2020; 55: 1900753

“The main changes in this update, compared with the 2003 ERS task force document are

- 1) new quality control procedures which reflect use of “within-breath” analysis, and methods of handling artefacts;*
- 2) recommendation to disclose signal processing, quality control, artefact handling and breathing protocols (e.g. number and duration of acquisitions) in reports and publications to allow comparability and replication between devices and laboratories;*
- 3) a summary review of new data to support threshold values for bronchodilator and bronchial challenge tests; and*
- 4) updated list of predicted impedance values in adults and children.”*

“The recommended thresholds for positive bronchodilator responses in both children and adults is -40% in Rrs5, +50% in Xrs5 and -80% in AX. z-scores are recommended for future definition of a significant response, which will require data of bronchodilator responses in healthy populations.”

“Oscillometry testing should precede tests requiring deep breaths (e.g. exhaled nitric oxide, spirometry, diffusing capacity) and allow a standardised length of time during which deep breaths are withheld, before performing oscillometry.”

“Modern analysis tools allow removal of entire breaths affected by artefact, so that an acquisition may remain technically acceptable, as long as there are at least three breaths remaining in that acquisition”

“The ideal forcing frequency when applied to spontaneous breathing is ≥ 4 Hz (changed from ≥ 2 Hz) Not using coherence function for quality control and use of CoV $\leq 10\%$ in adults and $\leq 15\%$ in children.”

“it is recommended to use at least three replicates, which are deemed acceptable after application of specified quality criteria: visual inspection, within-session coefficient of variability (CoV) and automated signal processing.”

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Oostveen, E., MacLeod, D., Lorino, H., Farre, R., Hantos, Z., Desager, K., & Marchal, on behalf of the ERS Task Force on Respiratory Impedance Measurements

THE FORCED OSCILLATION TECHNIQUE IN CLINICAL PRACTICE: METHODOLOGY, RECOMMENDATIONS AND FUTURE DEVELOPMENTS.

European Respiratory Journal, 2003, 22(6), 1026–1041.

“As a tool for the investigation of respiratory mechanics in clinical practice, the forced oscillation technique (FOT) is well supported theoretically.”

“The most attractive feature of FOT is that the forced oscillations are superimposed on the normal breathing, avoiding the need for any special breathing manoeuvre or any noticeable interference with respiration.”

“WESSELING and WOUTERS [61] found abnormal Zrs data in 70% of the subjects with chronic bronchitis in the presence of normal spirometry.”

“FOT has proven to be at least as sensitive as spirometry to detect impairment of lung function due to exposure to cigarette smoke or occupational hazards. The sensitivity to detect mild airway disease and the minimal requirements for subjects cooperation make FOT a very suitable lung function test for epidemiological and field studies.”

“A significant correlation between the changes in Rrs and FEV1 following bronchoconstriction has been reported by several investigators. “

“The deep inspiration that precedes forced expiration may modify airway smooth muscle tone, and, therefore, may influence the result of the BHR test. FOT has the considerable advantage that it measures airway properties during quiet breathing. This may be the reason why FOT has proved more sensitive than FEV1 to detect changes in BHR in asthmatics after corticosteroid treatment [101].”

“There is evidence that FOT and plethysmography provide comparable information on bronchial sensitivity and responsiveness and may be superior to spirometry”

Navajas, D., & Farré, R.

FORCED OSCILLATION TECHNIQUE: FROM THEORY TO CLINICAL APPLICATIONS,

Monaldi Archives for Chest Disease = Archivio Monaldi per Le Malattie Del Torace / Fondazione Clinica Del Lavoro, IRCCS [and] Istituto Di Clinica Tisiologica E Malattie Apparato Respiratorio, Università Di Napoli, Secondo Ateneo, 2001, 56(6), 555–62. 555–562.

“It has been suggested that FOT is adequate for assessing the increase in airway obstruction induced by bronchial challenge... Similarly, FOT has been used to assess the decrease in airway resistance induced by bronchodilation agents... Another interesting feature of FOT is that its time resolution allows the easy measurement of the dose-response effect”

“According to the currently available data, FOT has a sensitivity and specificity similar to that of conventional spirometric indices [65, 69].”

“In recent years, FOT has been employed to assess upper airway obstruction in patients with the sleep apnea/hypopnea syndrome (SAHS).”“The technique has enough time resolution to track the obstructive

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events undergone by the upper airway during the different phases of the breathing cycles.”

Bates, J. H. T., Irvin, C. G., Farré, R., & Hantos, Z..

OSCILLATION MECHANICS OF THE RESPIRATORY SYSTEM.

Comprehensive Physiology, 2011, 1(3), 1233–72.

“The reproducibility of Zrs in healthy humans is similar to that observed in other parameters of respiratory mechanics such as those provided by body plethysmography or the flow interrupter technique;”

“The FOT has been shown to reveal differences in baseline lung mechanics in patient both with asthma and COPD who had abnormal spirometry (52). Also, the frequency dependence of Rrs has been shown to change in patients with asthma or other obstructive diseases (37, 52, 112, 192, 212), likely due to the presence of ventilation inhomogeneities (37, 212). Furthermore, patients with different types of obstructive lung disease (emphysema, chronic bronchitis and asthma) have been reported to show different patterns of abnormality by the FOT with similar abnormalities in spirometry (282).”

“The FOT has also been shown to provide indices related to the severity of asthma (50), and can be used to detect central airway obstruction due to either tracheal stenosis or vocal cord dysfunction (137), which can be confused with asthma.”

“several recent studies have used the FOT to follow the temporal variations in lung function associated with asthma (72, 110, 233). Indeed, home monitoring via the FOT may become an important means of following asthmatic patients in the future (66).”

“Another characteristic feature of COPD is that Zrs is often very different between inspiration and expiration in contrast to the situation in normal subjects (65). In particular, the magnitude of Zrs is abnormally elevated in expiration due to the presence of expiratory flow limitation (68), which prevents the FOT from being able to probe the lung beyond the choke point where flow limitation occurs. Accordingly, bronchodilation produces a particularly marked reduction in the magnitude of Xrs when flow limitation is relieved (67).”

“The FOT has been used in patients with sarcoidosis, providing parameters that correlate significantly with those of spirometry. In particular, the magnitude of Zrs at 4Hz appears to be clinically useful in this disease (78).”

“Routinely measured lung volumes (total lung capacity and vital capacity) have been shown to correlate well with average Xrs and with the slopes of Xrs and Rrs versus frequency in patients that have ILDs but no sign of airway obstruction (281).”

FOT has been applied in occupational respiratory diseases such as silicosis in which the pattern of Rrs is similar to that seen in COPD; Rrs is elevated and has an increased negative dependence on frequency (59).

“The FOT can also be useful in assessing possible side effects of therapies in nonpulmonary diseases, such as the treatment of spinal cord injury with neostigmine and glycopyrrolate which have been implicated in increased airway secretions and bronchospasm (235).”

“Recent preliminary data suggest that the FOT could be useful for assessing the evolution of respiratory function soon after lung transplantation when spirometry is not feasible (119). “

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“In a study of patients with extra-thoracic upper airway obstruction, mostly due to carcinoma, Rrs and Xrs were correlated with airway resistance measured by body plethysmography. Moreover, Rrs tended to be higher in patients with upper airway obstruction compared to patients with COPD (284).”

“Tracheal stenosis is another extrapulmonary disease where the FOT has been employed to characterize respiratory resistance, and a strong correlation between indices derived from Rrs and the diameter of tracheostenosis has been reported (137). Patients with tracheal stenosis also tend to have a marked flow dependence of Rrs measured by FOT which has been found to be correlated with conventional upper airway obstruction indices derived from spirometry (288).”

PEDIATRICS

Beydon, N., Davis, S. D., Lombardi, E., Allen, J. L., Arets, H. G. M., Aurora, P., Wilson, N. M.

AN OFFICIAL AMERICAN THORACIC SOCIETY/EUROPEAN RESPIRATORY SOCIETY STATEMENT: PULMONARY FUNCTION TESTING IN PRESCHOOL CHILDREN.

American Journal of Respiratory and Critical Care Medicine, 2007, 175(12), 1304–45

“Lack of cooperation and noninvasiveness are key features of the FOT, which is therefore increasingly used in young children.”

“The feasibility of the FOT in the acutely ill, untrained preschool children measured in the emergency room ranged from 20% in 3 years old to more than 80% in 5 years old. In laboratory or field settings, higher values of 80 to 100% have been obtained in healthy preschool children or stable preschool patients.”

“The single frequency sinusoid has optimal signal-to-noise ratio; allows the descriptions of Zrs variations with time, within- and between-breath and in relation to flow and volume;”

“FOT assessment of response to bronchodilator was found to be in agreement with FEV1 and airway resistance with plethysmography”

“The FOT was probably one of the first techniques applied to preschool children to estimate the airway response to metacholine and histamine. ... In wheezy preschool children, changes in FOT paralleled those observed with plethysmography, interrupter resistance, or spirometry.

Frey, U..

FORCED OSCILLATION TECHNIQUE IN INFANTS AND YOUNG CHILDREN.

Paediatric Respiratory Reviews, 2005, 6(4), 246–54.

“In stable ASTHMA, higher respiratory resistance at various frequencies were found in the mid range in comparison with healthy subjects. These changes in Rrs were consistent with decreased FEV1 values in asthmatic group”

“Reversible airway obstruction and bronchial hyperresponsiveness (BHR) are significant components contributing to the diagnosis of bronchial asthma in infants and young children. Changes in mid-frequency Zin were related to changes in FEV1 or clinical signs after a challenge with bronchodilators. Similarly, BHR showed changes from baseline comparable or better than other lung function tests. The increased Rrs was accompanied by a decrease in Xrs in most studies after challenge.”

“One study assessed the feasibility of FOT in the emergency department in the untrained child with respiratory distress.

.... These success rates were higher than those for spirometry”

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