

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

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REV3 - March 2025

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MAKE OSCILLOMETRY ROUTINE

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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

Note 3: highlighted in **GREEN**, the last added items, in every category

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COPD, ADULT, REHABILITATION, SLEEP, COVID-19

ERS International Congress 2024, Vienna:

Romagnoli, I. et al.

FORCED OSCILLATIONS TECHNIQUE CAN HIGHLIGHT THE EFFECTS OF BRONCHIAL AIRWAYS CLEARANCE IN COPD. in 1.2 Rehabilitation and Chronic Care PA3784 (European Respiratory Society, 2016). doi:10.1183/13993003.congress-2016.PA3784.

Peták, F. et al.

PULMONARY FUNCTION IN POST-COVID PATIENTS UNDERWENT VENO-VENOUS EXTRACORPOREAL MEMBRANE OXYGENATION: 1-YEAR FOLLOW-UP. in *Clinical respiratory physiology, exercise and functional imaging* PA5265 (European Respiratory Society, 2024). doi:[10.1183/13993003.congress-2024.PA5265](https://doi.org/10.1183/13993003.congress-2024.PA5265).

Abozid, H., Wouters, E. F. M. & Breyer, M.-K.

OSCILLOMETRY IN CHRONIC COUGH: DATA FROM A GENERAL POPULATION COHORT. Respiration 103, 496–497 (2024).

Spittle DA, Thomas M, Stevens C, et al.

SYMPTOMS OF COPD IN THE ABSENCE OF AIRFLOW OBSTRUCTION ARE MORE INDICATIVE OF PRE-COPD THAN OVERDIAGNOSIS.

ERJ Open Res. June 2024:00264-02024. doi:10.1183/23120541.00264-2024

Singh P, Ahuja NB, Krishna SVS, et al.

ROLE OF OSCILLOMETRY TO DIAGNOSE OBSTRUCTIVE AIRWAY DISEASES IN PATIENTS WHO ARE UNABLE TO PERFORM SPIROMETRY CORRECTLY.

Med J Armed Forces India. July 2024. doi:10.1016/j.mjafi.2024.06.008

Grudzińska A, Okrzymowska P, Tomaszczyk A, Kalka D, Rożek-Piechura K.

ASSESSING THE CONSEQUENCES OF SMOKING TOBACCO PRODUCTS WITH CONSIDERATION OF THE FORCED OSCILLATION TECHNIQUE.

Med Sci Monit. 2024;30:1-12. doi:10.12659/MSM.944406

Nasr A, Papapostolou G, Jarenbäck L, et al.

EXPIRATORY AND INSPIRATORY RESISTANCE AND REACTANCE FROM RESPIRATORY OSCILLOMETRY DEFINING EXPIRATORY FLOW LIMITATION IN OBSTRUCTIVE LUNG DISEASES.

Clin Physiol Funct Imaging. 2024;(June). doi:10.1111/cpf.12895

Torregiani C, Baratella E, Segalotti A, et al.

OSCILLOMETRY LONGITUDINAL DATA ON COVID-19 ACUTE RESPIRATORY SYNDROME TREATED WITH NON-INVASIVE RESPIRATORY SUPPORT.

J Clin Med. 2024;13(7):1868. doi:10.3390/jcm13071868

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David A. Kaminsky, M.D

REAL-WORLD APPLICATION OF OSCILLOMETRY : TAKING THE LEAD

Editorial: American Journal of Respiratory and Critical Care Medicine, Volume 209 Number 4 | February 15 2024

Chiara Veneroni, Christoph Valach, Emiel F. M. Wouters, Alessandro Gobbi, Raffaele L. Dellaca, Marie-Kathrin Breyer, Sylvia Hartl, Owat Sunanta, Charles G. Irvin, Caspar Schiffers, Pasquale Pio Pompilio, and Robab Breyer-Kohansal

DIAGNOSTIC POTENTIAL OF FORCED OSCILLOMETRY TECHNIQUE : A POPULATION-BASED APPROACH

American Journal of Respiratory and Critical Care Medicine, Volume 209 Number 4 | February 15 2024

Amit K. Rath, Dibakar Sahu, Sajal De,

OSCILLOMETRY-DEFINED SMALL AIRWAY DYSFUNCTION IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

TRD (Tuberculosis and Respiratory Diseases) 2024 - DOI: <https://doi.org/10.4046/trd.2023.0139>

Craig R. Aitken, Girish Pathangeyb, Mathew Stamosc, Chul-Ho Kimc, Bruce D. Johnson, Glenn M. Stewart
REPRODUCIBILITY AND RESPONSIVENESS OF AIRWAY IMPEDANCE MEASURES DERIVED FROM THE FORCED OSCILLATION TECHNIQUE ACROSS DIFFERENT OPERATING LUNG VOLUMES

Respiratory Physiology & Neurobiology 320 (2024) 104200

Chris Campbell (Senior Editor, Respiratory Therapy)

CASE-STUDY LOOKS AT HOME MONITORING OF LUNG MECHANICS BY OSCILLOMETRY AMID COVID-19

Summary review of the publication: “ 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;

Respiratory Therapy, Vol 19, N.2 – Spring 2024

Sabina Kostorz-Nosal, Dariusz Jastrzębski, Anna Błach, Szymon Skoczyński

WINDOW OF OPPORTUNITY FOR RESPIRATORY OSCILLOMETRY: A REVIEW OF RECENT RESEARCH

Ped Pulm 2022 – April - <https://doi.org/10.1002/ppul.25923>

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.

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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

Sabina Kostorz-Nosal, Dariusz Jastrzebski 1, Piotr Kubicki, Dagmara Galle, Alicja Gałeczka-
Turkiewicz, Beata Toczyłowska, Dariusz Ziora

**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

**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](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

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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

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 Rodriguez 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. Dellacà' 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. Vagheggini, C. Veneroni, L. Perugino, L. Bertini, S. Nasoni, L. Carrozzi, R. Dellacà

COVID-19 MANAGEMENT IN AN ITALIAN PRISON. MONITORING OF PULMONARY FUNCTION USING

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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. Dellacà'

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

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>

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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, ,JoannaC.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

Ilaria Milesi, Roberto Porta, Luca Barbano, Simona Cacciatore, Michele Vitacca,Raffaele L. Dellacà

AUTOMATIC TAILORING OF THE LOWEST PEEP TO ABOLISH TIDAL EXPIRATORY FLOWLIMITATION 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 Bourk- e, 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

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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

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

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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

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 Malinovschi, 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 Kalchiem-Dekela, Stella E. Hinesa

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

Respiratory Medicine 136 (2018) 37–47

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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

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 TELEMONTORING

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

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CHRONIC OBSTRUCTIVE PULMONARY DISEASE (AECOPD) OR ACUTE HEART FAILURE (AHF) THROUGH FORCED OSCILLATION TECHNIQUE (FOT): PRELIMINARY RESULTS

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

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 Marušić, 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

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

Pasquale Pompilio, Valentina Isetta, Andrei Malinovschi, Jo Middlemass, Giulia Munaro, Mireia Dalmases, 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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DIAGNOSTIC POTENTIAL OF FORCED OSCILLOMETRY TECHNIQUE : A POPULATION-BASED APPROACH

American Journal of Respiratory and Critical Care Medicine Volume 209 Number 4 | February 15 2024

Mario Barreto, Chiara Veneroni, Mariaclaudia Caiulo, Melania Evangelisti, Pasquale Pio Pompilio, Maria Cristina Mazzuca, Giorgia Raponi, Jacopo Pagani and Pasquale Parisi
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FORCED OSCILLOMETRY TECHNIQUE IN CHILDREN WITH PRESCHOOL WHEEZE: FEASIBILITY AND RELATIONSHIP TO CLINICAL PARAMETERS

F Alabdulkareem, Y Bingham, S Irving, D Saglani

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OSCILLOMETRY IN SEVERE ASTHMA: THE STATE OF THE ART AND FUTURE PERSPECTIVES

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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

European Respiratory Society congress 2023, Milan, Italy, 9-12 Sept 2023

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

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

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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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”.

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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 - <https://doi.org/10.1002/ppul.25984>

Daniel Woodcock, Thuvaraka Alagusiththiram and Meredith J. P. Robertson

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

8th King's John Price Paediatric Respiratory Conference, 16-17th June 2022

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

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

ERS 2022 Poster Presentation (Session 227 - PA1753) :

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

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

Congresso SIMRI 2022 (Italian society of pediatric respiratory diseases), Palermo, 27-29 Ott 2022

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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IMPEDENZOMETRIA E SPIROMETRIA NEI PAZIENTI PEDIATRICI AMBULATORIALI CON SINTOMI RESPIRATORI RICORRENTI. INFLUENZA DELLE CARATTERISTICHE ANTROPOMETRICHE E INFIAMMATORIE

IN ITALIAN : FOT AND SPIROMETRY IN PEDIATRIC PATIENTS IN HOSPITAL OUTPATIENTS CLINIC WITH RECURRENT RESPIRATORY SYMPTOMS, INFLUENCE OF ANTROPOMETRIC AND INFLAMMATORY CHARACTERISTICS

M.C. Mazzuca, M.S. Salvetta, G. Raponi, A. Morelli, F. Guglielmi, M. Evangelisti, P. Parisi, M. Barreto.

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Congresso SIMRI 2022 (Italian society of pediatric respiratory diseases), Palermo, 27-29 Ott 2022
CONFRONTO TRA IMPEDENZOMETRIA E SPIROMETRIA NEI PAZIENTI PEDIATRICI AMBULATORIALI CON RINITE, SINDROME DELLE APNEE OSTRUTTIVE DEL SONNO (OSAS) E ASMA.

IN ITALIAN : COMPARISON BETWEEN FOT AND SPIROMETRY IN PEDIATRIC PATIENTS IN HOSPITAL OUTPATIENTS WITH RHINITIS, OBSTRUCTIVE APNEA SYNDROME AND ASTHMA

, G. Raponi, A. Morelli M.C. Mazzuca, M.S. Salvetta, F. Triolo, M. Evangelisti, P. Parisi, M. Barreto.

ATS 2022 Poster Presentation:

WITHIN-BREATH ANALYSIS OF RESPIRATORY MECHANICS IN A MARFAN SYNDROME ADOLESCENT WITH EXERTIONAL DYSPNEA

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

ATS 2022 Poster Presentation:

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,

OSCILLOMETRY: A SUBSTITUTE OF SPIROMETRY IN CHILDREN WITH NEUROMUSCULAR DISEASES?

Ped Pulm 2022 – April - <https://doi.org/10.1002/ppul.25923>

Neeraj Gupta

CAN OSCILLOMETRY BE A SUBSTITUTE TO SPIROMETRY IN THE INDIGENT?

Lung India 2022;39:74-6.

Chiara Veneroni, Pasquale Pio Pompilio, Kjell Alving, Christer Janson, Leif Nordang, Raffaele Dellacà, Henrik Johansson, Andrei Malinovski

SELF- REPORTED EXERCISE- INDUCED DYSPNEA AND AIRWAYS OBSTRUCTION ASSESSED BY OSCILLOMETRY AND SPIROMETRY IN ADOLESCENTS

Pediatr Allergy Immunol. 2021;00:1–12 - DOI: 10.1111/pai.13702

Gupta N, Sachdev A, Gupta D, Gupta S.

ASSESSMENT OF AIRWAY REVERSIBILITY IN ASTHMATIC CHILDREN USING FORCED OSCILLATION TECHNIQUE – A SINGLE-CENTER EXPERIENCE FROM NORTH INDIA

Lung India 2021;38:229-35.

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Barreto M, Ambat F, Roccabella F, Caiulo M, Montesano M, Evangelisti M, Martella S, Villa MP. J
**FORCED OSCILLATION MEASUREMENTS IN BRONCHIAL CHALLENGE WITH EXERCISE AND
BRONCHODILATOR RESPONSE IN CHILDREN WITH RECURRENT RESPIRATORY SYMPTOMS.**
Pediatr Pulmonol. 2021; 56 (S2), S140. ISSN 8755-6863. – CIPP congress supplement June 2021

Piga GS, Barreto M, Montesano M, Roccabella F, Caiulo M, Ambat F, Triolo MF, Colucci C, Villa MP. A
**MAJOR CRITERIA FOR THE MODIFIED API AND OTHER RISK FACTORS FOR ASTHMA: FINDINGS IN
PRESCHOOL-AGED OUTPATIENTS ATTENDING DIFFERENT MEDICAL SETTINGS.**
Pediatr Pulmonol. 2021; 56 (S2), S92. ISSN 8755-6863. – CIPP congress supplement June 2021

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>
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>.

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>

Eero Lauhkonen, Georgios Kaltsakas, Sindhu Thevnajan, Richard Iles
COMPARISON OF FORCED OSCILLATION TECHNIQUE AND SPIROMETRY IN PAEDIATRIC ASTHMA
ERJ Open Research 2020; DOI: 10.1183/23120541.00202-2020

Samriti Gupta & Sushil K. Kabra
**INDIGENOUS REGRESSION EQUATIONS FOR FORCED OSCILLATION TECHNIQUE– A MUCH NEEDED
AFFAIR**
Indian Journal of Pediatrics, 2020 - <https://doi.org/10.1007/s12098-020-03194-2>

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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Sajal De

LONG-TERM AMBIENT AIR POLLUTION EXPOSURE AND RESPIRATORY IMPEDANCE IN CHILDREN: A CROSS-SECTIONAL STUDY

Respiratory Medicine 2019 – Published October 01, 2019: <https://doi.org/10.1016/j.rmed.2019.09.015>

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

Liwia Starczewska-Dymek, Andrzej Bozek, and M. Mielnik

THE SENSITIVITY AND SPECIFICITY OF THE FORCED OSCILLATION TECHNIQUE IN THE DIAGNOSIS OF BRONCHOCONSTRICTION IN CHILDREN

Journal of Asthma 2019 - <https://doi.org/10.1080/02770903.2019.1702054>

ERS 2019 Thematic Poster Presentation (4517):

FOT AND IOS IOS DEPICT LONGER DURATION OF DISEASE IN CHILDREN WITH SICKLE CELL DISEASE (SCD) WHILE N2MBW PROVIDES NEW INSIGHT ON RESPIRATORY PATTERN

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

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

ERS 2019 Thematic Poster Presentation (2666): **CHARACTERIZATION OF ASYMPTOMATIC SUBJECTS WITH EXERCISE-INDUCED BRONCHOCONSTRICTION (EIB)**

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

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

ERS 2019 Thematic Poster Presentation (3880): **FORCED OSCILLATION TECHNIQUE MEASURING PERIPHERAL AIRWAY INVOLVEMENT DURING MANNITOL CHALLENGE**

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

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

EAACI 2019 and ALLERGY 2019: Poster presentation and Letter to the editor:

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.

EAACI (European Academy of Allergy and Clinical Immunology), Lisbon, Portugal 1-5 June 2019

<https://doi.org/10.1111/all.13938> and published in ALLERGY June 2019

<https://doi.org/10.1111/all.13938>

Liwia Starczewska Dymek, Andrzej Bozek, and Tomasz Dymek

APPLICATION OF THE FORCED OSCILLATION TECHNIQUE IN DIAGNOSING AND MONITORING OF BRONCHIAL ASTHMA IN PRESCHOOL CHILDREN

Adv. Resp. Med 2019; 87: 25-35

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

DISMANTLING AIRWAY DISEASE WITH THE USE OF NEW PULMONARY FUNCTION INDICES

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Alessandro Gobbi, Carlo Gulotta, Béla Suki, Enrico Mellano, Riccardo Pellegrino, Vito Brusasco, Raffaele L. Dellacà

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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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TOWARD PREDICTING INDIVIDUAL RISK IN ASTHMA USING DAILY HOME MONITORING OF RESISTANCE

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Alessandro Gobbi, Claudia Calogero, Pasquale Pompilio, Grazia Fenu, Raffaele Dellacà, Enrico Lombardi
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ERS 2017 Oral Presentation: **EFFECT OF DIFFERENT MASK DESIGN FOR MEASURING RESPIRATORY INPUT IMPEDANCE IN PRE-SCHOOL CHILDREN BY FORCED OSCILLATION TECHNIQUE (FOT)**

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ERS 2017 Oral Presentation: **FORCED OSCILLATION TECHNIQUE: AN ALTERNATIVE OUTCOME MEASURE FOR METHACHOLINE PROVOCATION TEST**

R O Salvador¹, E Dijkers¹, P Sterk², R van Steenwijk²
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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

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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

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

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

Pasquale Pompilio, Valentina Isetta, Andrei Malinovschi, Jo Middlemass, Giulia Munaro, Mireia Dalmases, 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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Eur Respir J 2014; 44

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

Pasquale Pompilio, Valentina Isetta, Andrei Malinovschi, Jo Middlemass, Giulia Munaro, Mireia Dalmases, 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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OSCILLOMETRY IN TOTAL LARYNGECTOMIZED PATIENTS: A CASE STUDY

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ERS 2022 Poster Presentation (Session 70 – PA237) :

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USE OF ARTIFICIAL INTELLIGENCE FOR IMPROVING QUALITY CONTROL OF OSCILLOMETRY
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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
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INFLUENCE OF AN ULTRAENDURANCE EVENT ON LUNG HEALTH

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Valach, C. et al.

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

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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)

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

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Chest, 113(5), 1322–8.

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

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

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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 REVIEWS

Ducharme, F. M. & Chan, R.

OSCILLOMETRY IN THE DIAGNOSIS, ASSESSMENT, AND MONITORING OF ASTHMA IN CHILDREN AND ADULTS.

Annals of Allergy, Asthma & Immunology **134**, 135–143 (2025).

“The growing body of evidence supports the use of oscillometry as a responsive tool for diagnosing asthma, as a discriminative and predictive tool for assessing control and future risk, and as a reproducible and responsive tool for longitudinal monitoring of disease progression. Its ability to detect changes in airway resistance and reactance in the entire respiratory system, and particularly in the small airways, makes oscillometry a unique tool for assessing treatment efficacy and disease progression in patients with predominant or isolated SAD. Given the above-mentioned properties, oscillometry is a valid alternative to spirometry in patients too young or otherwise unable to reproducibly cooperate with the forced expiratory maneuver required for spirometry or in whom access to spirometry is limited.”

Chan, R. *et al.*

ASCERTAINMENT OF SMALL AIRWAY DYSFUNCTION USING OSCILLOMETRY TO BETTER DEFINE ASTHMA CONTROL AND FUTURE RISK: ARE WE READY TO IMPLEMENT IT IN CLINICAL PRACTICE?

CHEST S0012369224057283 (2024) doi:[10.1016/j.chest.2024.12.020](https://doi.org/10.1016/j.chest.2024.12.020).

“Although identification of SAD by oscillometry has been found to be clinically useful in managing asthma, very few physicians, including specialists, use this technique as part of standard or adjunct evaluation of lung function to diagnose asthma, grade severity of airway obstruction, ascertain disease control or the risk for future exacerbations or to make management decisions. To rectify the unrecognized value of oscillometry in the asthma community, a consortium of authors who are investigators with knowledge and experience of oscillometry wished to address the most important clinical questions raised by our colleagues who are considering using this technique, including its clinical utility. In this article, we discuss integral concepts including applicability of oscillometry as a predictive tool for asthma exacerbations and disease control; adequacy of spirometry and oscillometry in assessing SAD; potential limitations of oscillometry; as well as treatment options for SAD.”

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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.

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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."

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

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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.”

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“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 Zrs 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).”

“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.”

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“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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