

## Roy Thomas McKay, Ph.D.

Work Phone: 513-558-1234  
email: [Roy@DrMcKay.com](mailto:Roy@DrMcKay.com)

Citizenship: United States of America 

**Education:** Smithtown Central High School, 9/69-6/72, Saint James, New York.

- A.S. State University of New York, Suffolk Community College. Selden, New York 9/72-6/74. Associate of Science, (A.S.).
- B.S. State University of New York, College at Oneonta, Oneonta, New York 9/74-6/76. Bachelor of Science in Chemistry, (B.S.).
- Ph.D. University of Cincinnati, College of Medicine, Department of Environmental Health, Cincinnati, Ohio 9/76-3/83. Doctor of Philosophy in Environmental and Occupational Toxicology, (Ph.D.).

**Current Positions:** Director: Occupational Pulmonary Services  
University of Cincinnati Physicians Inc  
Kettering Laboratory, ML # 458  
Cincinnati, Ohio 45267  
Phone: 513-558-1234  
May 26, 1983 - present

Professor Emeritus  
Division of Occupational and Environmental Medicine  
Department of Environmental Health, ML # 56  
University of Cincinnati, College of Medicine  
Cincinnati, Ohio 45267  
Phone: 513-558-1234

**Previous Positions:** Associate Professor  
Division of Occupational and Environmental Medicine  
Department of Environmental Health, ML # 56  
University of Cincinnati, College of Medicine  
Cincinnati, Ohio 45267  
June 1, 1987 - June 30, 2014

Research Associate  
Department of Environmental Health  
University of Cincinnati College of Medicine  
Cincinnati, Ohio 45267  
October 5, 1983 - June 1, 1987

## **Publications (Peer Reviewed Journals):**

- McKay RT**, Brooks SM, Johnson C. Isocyanate-induced abnormality of beta adrenergic receptor function. *Chest* 1981; 80S:61S-63S.
- McKay RT**, Brooks SM. Toluene diisocyanate (TDI): Biochemical and physiologic studies. *Am Rev Respir Dis* 1981; 123:132.
- McKay RT**, Lemasters G, Elia V. Ambient air styrene in communities near reinforced plastic processors. *Environmental Pollution (series B)* 1982; 4:135-141.
- McKay RT**. Biochemical and physiologic studies investigating mechanisms of toluene diisocyanate asthma. Doctoral dissertation, University of Cincinnati, 1982.
- Lockey JE, Jarabek A, Carson A, **McKay RT**, Harber P, Khoury P, Morrison J, Wiot J, Spitz H, Brooks SM. "Pulmonary Hazards from Vermiculite" in *Health Issues Related to Metal and Nonmetallic Mining*. Wagner W and Rom W. eds. Ann Arbor Scientific Press, Wolburn, MA, 1982.
- McKay RT**, Brooks SM. Effect of Toluene diisocyanate on beta adrenergic receptor function: Biochemical and physiologic studies. *Amer Rev Res Dis* 1983; 128:50-53.
- McKay RT**, Brooks SM. Induction of tracheal smooth muscle hyperresponsiveness to carbachol following exposure to toluene diisocyanate (TDI) vapors. *Am Rev Respir Dis* 1983; 127:174.
- McKay RT**, Brooks SM. Hyperreactive smooth muscle responsiveness following inhalation of toluene diisocyanate (TDI) vapors. *Amer Rev Respir Dis* 1984; 129:296-301.
- Lockey JE, Brooks SM, Jarabek AM, Khoury PR, McKay RT, Carson A, Morrison JA, Wiot JF, and Spitz HB. Pulmonary changes after exposure to vermiculite contaminated with fibrous tremolite. *Am Rev Respir Dis* 1984; 129:952-58.
- Kopp S, McKay RT, et al. Asthma and rhinitis due to ethylcyanoacrylate instant glue. *Annals of Internal Medicine* 1985; 102:613-615.
- Cibulas WJ, McKay RT, et al. Toluene diisocyanate-induced airway hyperreactivity and pathology in the guinea pig. *J. Allergy Clin Immunol* 1986; 77:828-834.

## **Publications, cont.:**

- Moller D, Brooks SM, McKay RT, et al. Chronic asthma due to toluene diisocyanate. Chest 1986; 90:494-499.
- McKay RT. Bronchoprovocation challenge testing in occupational airways disorders. Seminars in Respiratory Medicine 1986; 7:297-306.
- Moller D, McKay RT, Bernstein IL, Brook SM. Persistent airways disease from toluene diisocyanate. Am Rev Respir Dis. 1986; 134:175-176.
- Miller ML, Andringa A, Adams WD, Cibulas W, McKay RT, Vinegar A, Brooks Sm. Morphology of the tracheal and bronchial epithelium, and Type II cells of the peripheral lung from guinea pigs exposed to toluene diisocyanate vapors. 1987.
- Cibulas W, Brooks S, Murlas C, Miller M, McKay RT. Toluene diisocyanate-induced airway hyperreactivity occurs in guinea pigs depleted of granulocytes. Journal of Applied Physiology, 1988; 65(5):1773-1778.
- Cartier A, Bernstein IL, Burge PS, Fabbri L, Hargreave FE, McKay RT, Cohn J, Salvaggio JE. Guidelines for bronchoprovocation in the investigation of occupational asthma. J. Allergy and Clin Immunology, 1989; 84:823-829.
- McKay RT and Lockey J. Pulmonary function testing: Guidelines for medical surveillance and epidemiological studies. Occupational Medicine: State of the Art Reviews, 1991; 6:43-57.
- Weber A, Willeke K, Marchioni R, Myojo T, McKay R, Donnelly J, Liebhaber F. Aerosol Penetration and Leak Characteristics of Masks Used in the Health Care Industry. American Journal of Infection Control; 21: 167-173, 1993.
- Lemasters G, Lockey J, Rice C, McKay RT, Hansen K. Lu J, Levin L, Gartside P. Radiographic Changes Among Workers Manufacturing Refractory Ceramic Fibre and Products. Annals of Occupational Medicine; 38, Supplement 1: 745-751, 1994.
- Linz DH, Suskind RR, Lockey JE, Keebler PJ, Shulka R, Rice CH, Pflaumer JE, McKay RT, Livingston GK, Albert RE. Health Status of Pesticide Applicators with Attention to the Peripheral Nervous System. Journal of Agromedicine; 1(3):23-42, 1994.

## **Publications, cont.:**

Zelnick SD, **McKay RT**. Visual Field Loss While Wearing Full Face Respiratory Protection. American Industrial Hygiene Association Journal; 55:315-321, 1994.

Selected as the 1994 "**Best Paper Award**" for the American Industrial Hygiene Association Journal. Presented by the American Industrial Hygiene Association, Kansas City, MO, May 25, 1995.

**McKay RT**. Air Purifying Particulate Filter Respirators: Use, Types, and Limitations. American Association of Occupational Health Nurses Journal; 44 (5): 250-258, ISSN: 0891-0162; PMID: 8788401, 1996.

**McKay RT**. Citation of Drafts Questioned & Bitrex Fit Testing: Letter to the Editor, Am Indust Hyg Assoc J, 57:576-578, 1996.

**McKay RT**. Air Purifying Respiratory Protection. Chemical Health & Safety, September/October. 4:20-25, 1997.

**McKay RT**. Air Purifying Respirator Training. News & Reviews, 7:1-5, 1997.

Lockey JE, Levin LS, Lemasters GK, **McKay RT**, et al. Longitudinal Estimates of Pulmonary Function in Refractory Ceramic Fiber Manufacturing Workers. American Journal of Respiratory and Critical Care Medicine; 157:1226-1233, 1998.

Lemasters GK, Lockey JE, Levin LL, **McKay RT**, Rice CH, Horvath EP, Papes DM, Lu JW, Feldman DJ. An Industry-Wide Pulmonary Study of Men and Women Manufacturing Refractory Ceramic Fiber. Am J Epidemiology 148(9):910-919, 1998.

**McKay RT**, Levin LS, Lockey JE, Lemasters G, et. al. Weight Change and Lung Function: Implications for Workplace Surveillance. Journal of Occupational and Environmental Medicine 41(7):596-604, 1999.

American Thoracic Society. Jack Wanger, Robert Crapo, Paul Enright, John Hankinson, **Roy McKay**, et. al.. ATS Pulmonary Function Laboratory Management and Procedures Manual. A comprehensive manual with recommended methods and procedures for pulmonary function testing laboratories. Approximately 400 plus pages. 1999 (revised 2003).

## **Publications, cont.:**

Linz DH, **McKay RT**, Middaugh DA, Lockey JE. Chronic Hyperventilation Syndrome: An Under-Recognized Cause of Work Disability. *Journal of Disability*, Vol 1 (9) 1-8, 2000.

American Thoracic Society:

Crapo R, Casaburi R, Cotes A, Enright P, Hankinson J, Irvin CG, MacIntyre NR, **McKay RT**, Wanger, J, et. al.. **American Thoracic Society: Guidelines for Methacholine and Exercise Challenge Testing - 1999.** *American Journal of Respiratory and Critical Care Medicine* 161:309-329, 2000.

**McKay RT**, Davis E. Capability of Respirator Wearers to Detect Aerosolized Qualitative Fit Test Agents (Sweetener and Bitrex) with Known Fixed Leaks. *Applied Occup Env Hygiene*; 15(6): 479-484, 2000.

American National Standard for Color Coding of Air-Purifying Respirator Canisters, Cartridges, and Filters. ANSI Z88.7-2001. Contributor as a member of the full Z88 committee. May 3, 2001.

American National Standard for Respirator Fit Testing Methods - ANSI Z88.10-2001. Member of the subcommittee which developed and wrote the standard as well as a contributing member of the full Z88 committee. June 8, 2001.

American Thoracic Society:

Enright P, Zeballos RJ, Crapo R, Casaburi R, Cotes A, CG, MacIntyre NR, **McKay RT**, Johnson D, Wanger, J, Bittner V, Mottram C.. **American Thoracic Society Statement: Guidelines for the Six-Minute Walk Test.** *American Journal of Respiratory and Critical Care Medicine*, Vol 166:111-117, 2002.

Snyder EM & **McKay RT**. An Evaluation of Irritant Smoke to Detect Exhalation Valve Leakage in Respirators. *Applied Occupational and Environmental Hygiene Journal*; 18:702-707, 2003.

Delaney LJ, **McKay RT**, Freeman A. Determination of Known Exhalation Valve Damage Using Negative Pressure User Seal Check Methods on Full Face Respirators. *Applied Occupational and Environmental Hygiene*; 18(4): 237-243, 2003.

Grinshpun SA, Lee BU, Yermakov M, **McKay RT**. How to Increase the Protection Factor Provided by Existing Facepiece Respirators Against Airborne Viruses: A Novel Approach. *European Aerosol Conference 2004 Vol 2:S12363-1264*, 2004.

**Publications, cont.:**

Miller M., Crapo R, Hankinson J, Brusasco V, Burgos F, Casaburi R, Coates A, Enright P, van der Grinten CPM, Gustafsson P, Jensen R, Johnson DC, MacIntyre N, **McKay R**, Navajas D, Pedersen OF, Pellegrino R, Viegi G, Wanger J. **General Considerations for Lung Function Testing.** “ATS/ERS Task Force: Standardization of Lung Function Testing”. Eur Respir J 26:153-161, 2005.

Lee S-A, Grinshpun SA, Adhikari A, Li W, **McKay R**, Maynard A, Reponen T. **Laboratory and Field Evaluation of a New Personal Sampling System for Assessing the Protection Provided by the N95 Filtering Facepiece Respirators Against Particles.** Annals of Occupational Hygiene 49(3):245-257, 2005.

Miller M., Hankinson J, Brusasco V, Burgos F, Casaburi R, Coates A, Crapo R, Enright P, van der Grinten CPM, Gustafsson P, Jensen R, Johnson DC, MacIntyre N, **McKay R**, Navajas D, Pedersen OF, Pellegrino R, Viegi G, Wanger J. **Standardisation of Spirometry.** “ATS/ERS Task Force: Standardization of Lung Function Testing”. Eur Respir J 26:319-338, (August 1), 2005.

Lee S-A, Adhikari A, Grinshpun SA, **McKay R**, Shukla R., Reponen T. **Respiratory Protection Provided by N95 Filtering Facepiece Respirators Against Airborne Dust and Microorganisms in Agricultural Farms.** Journal of Occupational and Environmental Hygiene, 2:577-585, 2005.

**Winner of John White Award** for respiratory protection manuscripts published in the 2005 Journal of Occupational and Environmental Hygiene.

Wanger J, Clausen JL, Coates A, ... **McKay RT**, et. al. **Standardisation of the measurement of lung volumes.** Series “ATS/ERS Task Force: Standardization of Lung Function Testing”. Eur Respir J 26:511-522, 2005.

MacIntyre N, Crapo R, Hankinson J..., **McKay RT**, et. al. **Standardisation of the single breath determination of carbon monoxide uptake in the lung.** Series “ATS/ERS Task Force: Standardization of Lung Function Testing”. Eur Respir J 26:720-735, 2005.

Pellegrino R, Viegi G, Brusasco V, Crapo RO, Burgos F, Casaburi R, Coates A, van der Grinten CP, Gustafsson J, Hankinson J, **McKay RT.**, et al. **ATS/ERS Joint Statement: Interpretative Strategies for Lung Function Tests.** Series “ATS/ERS Task Force: Standardization of Lung Function Testing”. Eur Respir J 26:948-968, 2005.

**McKay RT**, Boone L. **Introducing the New ATS/ERS Standards** Vitalink, Vol 2, pgs 1-4, 2005.

**Publications, cont.:**

**McKay RT, Bradley J. Evaluation of Three New Fit Test Protocols for Use with the TSI PortaCount.** Journal of the International Society for Respiratory Protection. 22:112-121, 2005

Lee S-A, Adhikari A, Grinshpun SA, **McKay R**, Shukla R., Reponen T.  
**Personal Exposure to Airborne Dust and Microorganisms in Agricultural Environments.** Journal of Occupational and Environmental Hygiene, 3:118-130, 2006.

Identified as one of the **top 10** most frequently cited articles in the JOEH (as of March 2009).

New Interpretative Strategies for Lung Function Tests Do Help Patients  
Eur. Respir. J., Vol. 27, Issue 5, 1070 May 1, 2006

American National Standard for Respiratory Protection: Physical Qualifications for Respirator Wearers. ANSI Z88.6-2006. August 2006.

Laferty E & **McKay R**. Physiologic Effects and Measurement of Carbon Dioxide and Oxygen Levels During Qualitative Respirator Fit Testing. Journal of Chemical Health and Safety pages 22-28, September/October 2006.

Eninger RM, Honda T, Reponen T, **McKay R**, Grinshpun SA.  
What Does Respirator Certification Tell Us About Filtration of Ultrafine Particles? *J Occ Environ Hyg* 5:286-295, 2008.

**Winner of John White Award** for respiratory protection manuscripts published in the 2008 Journal of Occupational and Environmental Hygiene. Awarded by the Respiratory Protection Committee of the American Industrial Hygiene Association. Presented at the 2009 AIHce annual meeting in Toronto, Canada.

**Winner of the David L. Swift Memorial Outstanding Aerosol Paper Award** for 2008. What Does Respirator Certification Tell Us About Filtration of Ultrafine Particles? *Journal of Occupational and Environmental Hygiene* 5:286-295, 2008. Awarded by the Aerosol Technology Committee of the American Industrial Hygiene Association.

Hiroki Haruta, Takeshi Honda<sup>1</sup>, Robert M. Eninger, Tiina Reponen, **Roy McKay**, Sergey A. Grinshpun. Experimental and Theoretical Investigation of the Performance of N95 Respirator Filters against Ultrafine Aerosol Particles Tested at Constant and Cyclic Flows. *Journal of the International Society of Respiratory Protection* 25:75-88, 2008.

**Publications, cont.:**

- Rusch OW, Reponen T, Ronk C, **McKay RT**. Evaluation of User's Ability to Seal Respirator Cartridge Inlet Openings of Different Sizes and Shapes. *Journal of the International Society of Respiratory Protection* 25:97-106, 2008.
- Lockey JE, Utell MJ, Hilbert TJ, Levin LP, Ryan PH, White KL, Borton EK, Rice CO, **McKay RT**, LeMasters GK. Airway Obstruction Related to Diacetyl Exposure at Microwave Popcorn Production Facilities. *Journal of European Respiratory Society*, 34: 63-71, 2009.
- Sergey A. Grinshpun, Hiroki Haruta, Robert M. Eninger, Tiina Reponen, **Roy McKay**, and Shu-An Lee. Performance of an N95 Filtering Facepiece Particulate Respirator and a Surgical Mask during Human Breathing: Two Pathways for Particle Penetration. *Journal of Occupational & Environmental Hygiene*, 6:593-603, 2009.
- Winner of John White Award** for respiratory protection manuscripts published in the 2009 Journal of Occupational and Environmental Hygiene. Awarded by the Respiratory Protection Committee of the American Industrial Hygiene Association. Presented at the 2010 AIHce annual meeting in Denver, Colorado May 24, 2010.
- Kyungmin Jacob Cho, Tiina Reponen, **Roy McKay**, Rakesh Shukla, Hiroki Haruta, Padmini Sekar, Sergey A. Grinshpun. Large particle penetration through N95 respirator filters and facepiece leaks with cyclic flow. *Annals of Occupational Hygiene*, 54:68-77, 2010.
- Kyungmin Jacob Cho, Susan Jones, Gordon Jones, **Roy McKay**, Sergey A. Grinshpun, Rakesh Shukla, Alok Dwivedi, Umesh Sigh, Tiina Reponen. Effect of Particle Size on Respiratory Protection Provided by Two Types of N95 Respirators on Agricultural Farms. *Journal of Occupational & Environmental Hygiene*, 7:622-627, 2010.
- M.R. Miller, J. Hankinson, V. Brusasco, F. Burgos, R. Casaburi, A. Coates, P. Enright, C. van der Grinten, P. Gustafsson, R. Jensen, N. MacIntyre, **R.T. McKay**, O.F. Pedersen, R. Pellegrino, G. Viegi, and J. Wanger. Standardisation of lung function testing: the authors' replies to readers' comments. *Eur Respir J* 6:1496-1498, 2010.
- American National Standard for Respirator Fit Testing Methods - ANSI Z88.10-2010. Chair of sub-committee. ISBN: 978-1-935082-24-8. Published January 2011.
- Roy T. McKay**, Grace K. LeMasters, Timothy J. Hilbert, Linda S. Levin, Carol H. Rice, Eric K. Borton, and James E. Lockey. A Long Term Study of Pulmonary Function among US Refractory Ceramic Fibre Workers. *Occup Environ Med*, 68:89-96, 2011.



## Publications, cont.:

Tiina Reponen, Shu-An Lee, Sergey A. Grinshpun, Erik Johnson, **Roy McKay**  
Effect of fit testing on the protection offered by N95 filtering facepiece respirators against fine particles in a laboratory setting. *Annals of Occupational Hygiene*, 55: 264-271, 2011.

Francis X. McCormack, Yoshikazu Inoue, Joel Moss, ... **Roy T. McKay**, ... et.al.  
Efficacy and Safety of Sirolimus in Lymphangioliomyomatosis.  
*New England Journal of Medicine*, 364:1595-1606, 2011.

Kyungmin Jacob Cho, Tiina Reponen, **Roy McKay**, Alok Dwivedi, Atin Adhikari, Umesh Sigh, Rakesh Shukla, Susan Jones, Gordon Jones, Sergey A. Grinshpun. Comparison of Workplace Protection Factors for Different Biological Contaminants. *Journal of Occupational & Environmental Hygiene*, 8: 417-425, 2011.

McKibben J, **McKay R**, Levin L, Freeman, A, Pinney S.  
Redefining spirometry hesitating start criteria based on the ratio of extrapolated volume to timed FEVs. *Chest*, 140: 164-169, 2011.

Brunst K, Ryan P, Lockey, Bernstein D, **McKay, R**, et al.  
Unraveling the relationship between aeroallergen sensitization, gender, second-hand smoke exposure and impaired lung function. *Pediatric Allergy and Immunology*; 23: 479-487, 2012.

Sheng-Hsiu Huang, Chun-Wan Chen, Yu-Mei Kuo, Nian Cih Wu, **Roy McKay** and Chih-Chieh Chen. Factors Affecting Filter Penetration and Quality Factor of Particulate Respirators. *Aerosol and Air Quality Research*, 13: 162-171, 2013.

Kyungmin Jacob Cho, Leonid Turkevich, Matthew Miller, **Roy McKay**, Sergey Grinshpun, KwonChul Ha, and Tiina Reponen. Penetration of fiber versus spherical particles through filter media and face seal leakage of N95 filtering facepiece respirators with cyclic flow. *Journal of Occupational and Environmental Hygiene*, 10:109-115, 2013.

He X, Yermakov M, Reponen T, **McKay RT**, James K, Son SY, and Grinshpun SA. Manikin-Based Performance Evaluation of Elastomeric Respirators Against Combustion Particles. *Journal of Occupational and Environmental Hygiene*, 10: 203-212, 2013.

**Winner of John White Award** for respiratory protection manuscripts published in the 2013 *Journal of Occupational and Environmental Hygiene*. Awarded by the Respiratory Protection Committee of the American Industrial Hygiene Association.

- Xinjian He, Sergey A. Grinshpun, Tiina Reponen, Michael Yermakov, **Roy McKay**, Hiroki Haruta, and Kazushi Kimura. Laboratory Evaluation of the Particle Size Effect on the Performance of an Elastomeric Half-mask Respirator Against Ultrafine Combustion Particles. *Annals of Occupational Hygiene* (first published online doi:10.1093/annhyg/met014), 57: 884-897, 2013.
- Xinjian He, Sang-Young Son, Kelley James, Michael Yermakov, Tiina Reponen, **Roy T. McKay**, & Sergey A. Grinshpun. Exploring a Novel Ultrafine Particle Counter for Utilization in Respiratory Protection Studies. *Journal of Occupational and Environmental Hygiene*, 10(4): D52-D54, 2013.
- Xinjian He, Tiina Reponen, **Roy T. McKay**, and Sergey A. Grinshpun. Effect of Particle Size on the Performance of an N95 Filtering Facepiece Respirator and a Surgical Mask at Various Breathing Conditions. *Aerosol Science and Technology* 47:1180-1187, 2013.
- Xinjian He, Sergey A. Grinshpun, **Roy T. McKay**, Mikhail Yermakov, Tiina Reponen, Jue Lu and Parviz Soroushian. Performance Characteristics of an Elastomeric Half-mask Respirator Modified with a Polymeric Micro-Patterned Adhesive. *Journal of the International Society for Respiratory Protection* 30: 95-104, 2013.
- Xinjian He, Tiina Reponen, **Roy McKay** & Sergey Grinshpun. How does breathing frequency affect the performance of an N95 filtering facepiece respirator and a surgical mask against surrogates of viral particles? *Journal of Occupational & Environmental Hygiene* 11: 178-185, 2014.
- He X, Grinshpun SA, Reponen T, **McKay R**, Bergman M, and Zhuang Z. Effect of Breathing Frequency and Flow Rate on the Total Inward Leakage of an Elastomeric Half-Mask Donned on an Advanced Manikin Headform. *Annals of Occupational Hygiene* 58:182-194, 2014.
- J Lockey, K Dunning, T Hilbert, E Borton, L Levin, C Rice, **R McKay**, R Shipley, C Meyer, C Perme, G LeMasters. HRCT/CT and Associated Spirometric Effects of Low Libby Amphibole Asbestos Exposure. *Journal of Occupational and Environmental Medicine* 57:6-13, 2015.
- American National Standard Practices for Respiratory Protection  
ANSI/ASSE Z88.2 - 2015  
Member of the subcommittee which developed and wrote the standard as well as a contributing member of the full Z88 committee. March 4, 2015.
- S Gao, **RT McKay**, M Yermakov, J Kim, T Reponen, X He, K Kimura, SA Grinshpun Performance of an Improperly Sized and Stretched-out Loose-fitting Powered Air-purifying Respirators: Manikin-based Study. *Journal of Occupational & Environmental Hygiene*, 13(3): 169-176, 2016.

Larry Janssen and **Roy McKay**

What's in a Definition? New Terminology for Respiratory Protection.  
*The Synergist*, 27(4), April: 34-37, 2016.

Spelce D., **McKay R.T.**, Johnson J, Rehak T, & Metzler R.

Respiratory Protection for Oxygen Deficient Atmospheres. *Journal of the International Society for Respiratory Protection*, 33(2) 1-21, 2016.

Lockey J,... **McKay R.**, et al.. "Letter to the Editor: Pleural plaques and lung function in the Marysville worker cohort: a re-analysis" by Zu et al (2016).  
*Inhalation Toxicology*, 29 (2): 43-45, 2017.

Spelce D., Metzler R, Johnson J, Rehak T, & **McKay R.**

Revisiting Respirators for Oxygen Deficient Atmospheres: A Comparison of OSHA and Z88.2 Approaches to Respiratory Protection. *The Synergist*: 30-33, March 2017

Janssen L & **McKay R.**

Respirator Performance Terms. *Journal of Occupational & Environmental Hygiene*, 14 (12): D181-D-183, 2017.

**McKay R.** Respirator Fit Test Methods - Are Faster Protocols Equivalent to OSHA?  
*Journal of Occupational & Environmental Hygiene*, 15 (7): D53-D57, 2018.  
DOI: 10.1080/15459624.2018.1463098

**McKay, RT.**

Respirator Use at High Altitudes. Does an SCBA Respirator Protect Wearers from Oxygen Deficient Atmospheres Due to Increasing Altitude? *The Synergist*. Pages 26-29, January 2020.

ASTM F3407-20 Standard Test Method for Respirator Fit Capability (RFC) for Negative-Pressure Half-Facepiece Particulate Respirators. Co-author. Developed by subcommittee F23.65 and published November 2020.

S Grinshpun, H Haruta, R Eninger, T Reponen, R T **McKay** & Shu-An Lee (2021)  
Eficacia de la mascarilla facial con filtro de partículas N95 y de la mascarilla quirúrgica durante la respiración humana: dos vías para la penetración de partículas, *Journal of Occupational and Environmental Hygiene*, 18:sup1, S1-S14, 2021 DOI:10.1080/15459624.2021.1877051

X He, T Reponen, R **McKay** & S Grinshpun (2021)

¿Cómo afecta la frecuencia respiratoria el desempeño de una mascarilla respiratoria autofiltrante N95 y de una mascarilla quirúrgica contra sustitutos de partículas virales?, *Journal of Occupational and Environmental Hygiene*, 18:sup1, S15-S24, 2021.  
DOI: 10.1080/15459624.2021.1877069

## **Publications, cont.:**

ASTM F3537-21 Standard Guide for Respirator Fit Test Methods. Co-author.  
Developed by 3-member subcommittee of F23.65 and published November 2021.

Jacob Persky, Wendi Egan, Jon Redmond, **Roy McKay**: The Importance of Performance Validation Testing: New Standards for Evaluating the Quality of Fit Provided by Filtering Facepiece Respirators, Elastomeric Respirators and "COVID Face Masks". *Occupational Health & Safety*, White Paper 2022.  
<https://ohsonline.com/whitepapers/2022/01/the-importance-of-performance-validation-testing/asset.aspx?admgarea=whitepaper>

Richard Metzler, D Spelce, J Johnson, C Coffey, Tim Rehak, **Roy T. McKay**  
A Good Seal - Why Respirator Fit Testing is Essential for Filtering Facepiece Respirators. *The Synergist*, Pages 28-30, October, 2023.

## **Manuscripts Accepted for Publication (In Press):**

Ryan P, C Wolfe, J Burkle, C Brokamp, **R McKay**, T Hilbert, L Levin, C Rice, J Lockey, B Black, G LeMasters Childhood Exposure to Libby Amphibole Asbestos and Respiratory Health in Young Adults. Accepted *Environmental Research*. doi: 10.1016/j.envres.2017.07.013. Epub 2017 Jul 8.

## **Manuscripts Submitted for Publication:**

LeMasters G, Lockey J, Hilbert T, Dunning K, **McKay RT**, Levin L, Rice C. Respiratory follow-up pre- and post- engineering controls or cessation of diacetyl at four microwave popcorn facilities. Submitted to *Journal of European Respiratory Society*, June 2019.

## **Manuscripts in Preparation:**

**McKay RT.** Human Factors Affecting Qualitative Respirator Fit Testing Results

## **Policy Making Documents:**

Assisted in the development of the following documents:

DOL OSHA-OOC-2020-103

RESPIRATORY PROTECTION GUIDANCE for the Employers of Those Working in Nursing Homes, Assisted Living, and Other Long-Term Care Facilities During the COVID-19 Pandemic. November 2020.

<https://www.osha.gov/sites/default/files/respiratory-protection-covid19-long-term-care.pdf>

NIOSH-NPPTL, CDC, OSHA

Preparing Solutions for Qualitative Fit Testing from Available Chemicals

Updated June 16, 2020

<https://www.cdc.gov/niosh/npptl/QualitativeFitTesting.html>

ASTM F3407-20 Standard Test Method for Respirator Fit Capability (RFC) for Negative-Pressure Half-Facepiece Particulate Respirators. Co-author. Developed by subcommittee F23.65 and published November 2020.

ASTM Committee F23.65 Personal Protective Clothing and Equipment.

Subcommittee WK76274 - Revision of F3502-21 Standard Specification for Barrier face Coverings - Quantitative Leakage Assessment Testing workgroup. May 2021 - present.

## **Papers not published:**

This section represents papers submitted or prepared for publication, but not published and is provided for the purpose of demonstrating scope of activities performed.

**McKay RT**, Simpson CE, Lemasters GK, Lockey JE, Conkel BS, Lu J. Prevalence of side effects associated with spirometry. (submitted for publication), 1994.

Lockey JE, Lemasters GK, Rice CH, Simpson SR, Hansen KR, Lu JW, Levin LL, Wiesenhahn DM, Gartside PS, **McKay RT**. An Industry-Wide Retrospective Cohort Study of Exposure to Refractory Ceramic Fibers and Pleural Plaques. Submitted to The New England Journal of Medicine, 1994.

Forte TE, Linz DH, **McKay RT**, Middaugh DA. Misdiagnosis of lung disease after palatal surgery. Paper submitted, 1996.

Levin L, Lemasters G, Lockey J, Rice C, **McKay RT**, Miler J. Innovative Statistical Modeling of Pulmonary Function and Exposure Effect Evaluation. Manuscript initially submitted to American Journal of Epidemiology, 1995.

Hodges M, **McKay RT**. A Comparison of Sodium Saccharin versus Controlled Negative Pressure for Detecting Known Leaks in Full Face Respirators. Manuscript submitted for publication in the American Industrial Hygiene Association Journal, October 5, 2001.

## Chapters in Books, etc.:

**McKay RT**, Horvath EP. Pulmonary function testing in industry. Occupational Medicine: Principles and Practical Applications. 3rd Edition. Mosby Publishers, pages 229-236, 1994.

**McKay RT**, Effectiveness of Respirators. Current Asbestos Legal, Medical and Technical Research. Volume 10 of the Sourcebook of Asbestos Diseases. Butterworths Publishers, pages 91-113, 1994.

## Other Publications:

**McKay RT**, Brooks SM. Isocyanate Monitoring. Correspondence (Letter) Amer. Indust. Hyg. Assoc. J. 1983; 44:B-19-20.

**McKay RT** and Brooks SM. Evaluation of NIOSH Approved Pulmonary Function Testing Courses. NIOSH # 84-132, March 1986.

**McKay RT**. Isocyanates. Depictions, 1990; 9 (1): 1-2.

**McKay RT**. Respiratory fit testing: Helping to prevent occupational diseases. The Disability Manager 1990; 3(2):

Lockey JE, Lemasters G, Rice C, **McKay RT**, Gartside P, et al.  
A cross sectional analysis of respiratory health among current refractory ceramic fiber employees. Report to the Thermal Insulation Manufacturers Association (TIMA). December 28, 1991.

**McKay RT**, Williams GC, Good J, et al. Pulmonary function training objectives and criteria. Amer. Assoc. Occ. Health Nursing. 1991.

Lockey JE, Lemasters G, Rice C, **McKay RT**, Gartside P.  
A Retrospective Cohort Morbidity and Nested Case-Control Study of the Refractory Health of Individuals Manufacturing Refractory Ceramic Fiber and RCF Products. Report to the Carborundum Company. October, 1993.

Linz DH, Pinney SM, Levin LL, **McKay RT**, Rice CH, et al.  
Longitudinal Pulmonary Morbidity Study of Workers Exposed to Absorbent Gelling Material. Report to the Procter and Gamble Company. July 3, 1997.

**McKay RT**. **Respirator Fit Testing** and Use of Negative Pressure Respirators for Protecting Military Personnel Against **Chemical Warfare Agents**. United States Navy Report (NAVSEA). March 1998.

**McKay RT**. Technical Report. Preventing COVID in HCWs: Study Claims Medical Masks Equivalent to N95 FFRs? January 15, 2023.

## Abstracts:

- Brooks SM, McKay RT, Epidemiologic methods for identifying occupational asthma due to isocyanates. *Am Rev Respir Dis* 1981; 123:133.
- Lockey J, Jarabek A, Carson A, McKay RT, Harber P, Khoury P, Morrison J, Brooks SM. Single breath diffusion capacity (DLcosb) in a working population. *Am Rev Respir Dis* 1981; Abstract, 123:132.
- Lockey J, Jarabek A, Carson A, McKay RT, Harber P, Khoury P, Morrison J, Wiot J, Spitz H, Brooks SM. Health effects of vermiculite exposure. *Am Rev Respir Dis* 1981; Abstract 123:133.
- Cibulas WJ, Adams W, Miller M, Vinegar A, McKay RT, Brooks SM. Changes in airway reactivity after toluene diisocyanate (TDI) exposure. *Am Rev Respir Dis* 1984; 129:A159.
- Cibulas W, Vinegar A, Murlas C, McKay RT, Schmidt D, and Brooks S. The degree of airway obstruction but not hyperreactivity correlates with dose-duration of toluene diisocyanate (TDI). *Am Rev Respir Dis* 1985; 131:A180.
- Murlas C, Campbell J, Cibulas W, McKay R, and Brooks S. Airway smooth muscle hyperresponsiveness in acute TDI-induced bronchial hyperreactivity. *Am Rev Respir Dis* 1985; Abstract 131:A276.
- Cibulas W, Murlas C, Vinegar A, McKay R, and Brooks S. Short-term high level TDI exposure results in nonspecific airway hyperreactivity independent of airway mucosal permeability. *Am Respir Dis* 1985; Abstract 131:A334.
- McKay RT, Brooks SM, Moller D, and Kopp S. Use of bronchoprovocation challenge testing for the detection of isocyanate sensitive workers. Abstract: *Am Ind Hygiene Conf.* # 220, 1986.
- Swinehart G, Mulligan K, Rice C, McKay RT, Gener N, and Burroughs GE. Hexamethylene diisocyanate monomer and prepolymer characterizations. Abstract: *Am Ind Hygiene Conf*, # 145, 1986.
- Cibulas W, Murlas C, Miller M, McKay R, Vinegar A, Brooks S. Toluene diisocyanate-induced airway hyperreactivity occurs in guinea pigs depleted of granulocytes. Abstract: *Chest*, 1987; 9:295.



**Abstracts**, continued:

- Reh CM, Rice CH, Mulligan KJ, **McKay RT**, and Burroughs E. Evaluation of sampling methods for hexamethylene diisocyanate: A field study of polyurethane spray paint booths. Abstract: Am Ind Hygiene Conf, Montreal, Canada, 1987.
- McKay RT**, Linz D, Smith D. Specific bronchoprovocation challenge testing to cigarette smoke. Am Rev Res Dis, 1989; 139:A556.
- McKay RT**, Khoury P, Ruff M, Enright G, Lockey J. FVC end of test criteria: Analysis of volume - time changes. Am Rev Respir Dis 1989; 139:A383.
- McKay RT**. Pulmonary function testing: Minimum standards versus desirable features. Am Rev Respir Dis, 1989; 139:A553.
- McKay RT**, Carson A, Cibulas W, Jarabek A, Brooks S. Evaluation of NIOSH approved pulmonary function training programs. Am Rev Respir Dis, 1989; 139:A553.
- Chen CC, **McKay R**, Marchioni R, Willeke. The Effect of Breathing on the Fit Factor. Presentation given to the tenth annual meeting of the American Association of Aerosol Research. Traverse City, Michigan, October 1991.
- Pippenger CC, Bhattacharya A, Dietrich K, & **McKay R**. Effects of Respirator Helmet and Postural Fatigue On Upright Balance. Poster Presentation given at the American Industrial Hygiene Conference and Exhibition, New Orleans, LA, May 24, 1994.
- Levin L, Lemasters G, Lockey J, Rice C, **McKay R**, & Miller J. Innovative Statistical Modeling of Pulmonary Function Outcome for Exposure Effect Evaluation. Submitted to the 5th International Conference on Environmental and Occupational Lung Disease, Orlando, FL, March 2, 1995.
- McKay RT** & Davies E. Capability of Aerosolized Qualitative Fit Test Agents (Sweetener and Bitrex) to Detect Known Leakage in Half Mask Respirators. Submitted to the 1998 Annual AIHCE, October 1997.
- Freeman AG & **McKay RT**. An Evaluation of Pressure-Monitored User Seal Checks in Detecting Industrial Respirator Leakage. Submitted to the 1998 Annual AIHCE, October 1997.
- Lockey JE, Levin LS, Lemasters GK, **McKay RT**, Rice CH, Hansen KR, Papes DM, Simpson S, Medvedovic M. Longitudinal Estimates of Pulmonary Function in Refractory Ceramic Fiber Manufacturing Workers. Accepted for presentation at the 1998 ALA/ATS International Conference. Chicago, IL. April 27, 1998.

**Abstracts**, continued:

- Tomlin ME, Pinney S, Buncher CR, **McKay RT**, Brown MK. The effect of the mode of questionnaire administration on workers' response to cigarette smoking questions. Presented at the SER conference, Chicago, IL, June 26, 1998.
- McKay RT**, Freeman AG, Hall CL, Delaney LJ, Bradley JC. Respirator User Seal Checks: Use Limitations, and Defining a Standard Method. Presented at the 9th annual International Respiratory Protection conference, Pittsburgh, PA, October 1999.
- J. Lockey, **R. McKay**, E. Barth, J. Dahlsten, R. Baughman . Bronchiolitis Obliterans in the Food Flavoring Manufacturing Industry. American Thoracic Society annual meeting, 2002.
- Grinshpun SA, Lee BU, Yermakov M, **McKay RT**. How to Increase the Protection Factor Provided by Existing Facepiece Respirators Against Airborne Viruses: A Novel Approach. Abstract submitted February 2004.
- Eninger R, Grinshpun S, Honda T, Reponen T, **McKay R**. What Does Filtration Certification of Filtering Facepiece Respirators Tell Us? Presented at the American Industrial Hygiene Conference and Exposition (AIHce) in Philadelphia, PA on June 7, 2007.
- Grinshpun S, Honda T, Eninger R, **McKay R**. Performance Evaluation of a Novel Strapless Adhesion Face-Sealed Mask for Reducing Inhalation Exposure. Presented at the American Industrial Hygiene Conference and Exposition (AIHce) in Philadelphia, PA on June 7, 2007.
- J. Lockey, M. Utell, **R. McKay**, L. Levin, P. Ryan, K. White, E. Borton, T. Hilbert G. LeMasters. Loss of FEV1 Associated with Diacetyl Exposure at Popcorn Facilities. ATS conference in Toronto, May 2008.
- Haruta H, Reponen T, **McKay R**, Grinshpun S. Comparison of N95 Respirator Filters Against Ultrafine Particles Tested with Constant and Cyclic Flow. Presented at the American Industrial Hygiene Conference and Exposition (AIHce) in Toronto, Canada, June 2, 2009.
- Rusch O, Reponen T, **McKay R**. Evaluation of User's Ability to Seal Respirator Cartridge Inlet Openings of Different Sizes and Shapes. Presented at the American Industrial Hygiene Conference and Exposition (AIHce) in Toronto, Canada, June 3, 2009.

**Abstracts**, continued:

- Grinshpun S, Haruta H, Reponen T, **McKay R**. Pathways for Particle Penetration Through a Filtering Facepiece Particulate Respirator During Human Breathing. Presented at the American Industrial Hygiene Conference and Exposition (AIHce) in Toronto, Canada, June 3, 2009.
- Cho K, Reponen T, **McKay R**, Singh U, Adhikari A, Shukla R, Grinshpun S. Workplace Protection Factors of N95 Respirators Against Non-Biological and Biological Particles on Agricultural Farms. Presented at the American Industrial Hygiene Conference and Exposition (AIHce) in Toronto, Canada, June 3, 2009.
- Tiina Reponen, Shu-An Lee; Sergey A. Grinshpun, Erik Johnson, **Roy McKay**. Effect of fit-testing and particle size on the protection offered by N95 filtering facepiece respirators against fine particles. Presentation at the American Industrial Hygiene Conference and Exposition (AIHce) in Denver, 2010.
- S.A. Grinshpun, H. Haruta, K. Kimura, **R. McKay**, and T. Reponen. Prioritizing the performance characteristics of filtering facepiece particulate respirators: filter efficiency versus face seal leakage. . Presented at the Conference on Workplace Aerosols in Karlsruhe, Germany June 28 – July 2, 2010.
- Sergey A. Grinshpun, Tiina Reponen, and **Roy McKay**. Particle penetration into filtering facepiece particulate respirators: Quantification of primary pathways and novel design approaches. Presented at the International Society of Respiratory Protection (ISRP) international conference in Hong Kong September 26, 2010.
- Sergey A. Grinshpun, Tiina Reponen, **Roy McKay**, and K. Jacob Cho Enhanced Respiratory Protection Offered by a Strapless Filtering Facepiece Respirator. Podium Session #116 presented at the American Industrial Hygiene Conference and Exposition (AIHce) in Portland, Oregon on May 17, 2011.
- Kyungmin Jacob Cho, Tiina Reponen, **Roy McKay**, Atin Adhikari, Umesh Singh, Alok Dwivedi, Rakesh Shukla, Susan Jones, Gordon Jones, Sergey A. Grinshpun. Workplace Protection Factors for Two Types of N95 Respirators Used on Farms for Respiratory Protection Against Bioaerosols. American Industrial Hygiene Conference and Exposition (AIHce) in Portland, 2011.
- Sebastian K, Ryan PH, Biagini Myers JM, Lockey J, Bernstein DI, **McKay RT**, Hershey GK, Villareal M, Burkle J, LeMasters GK. Racial Effects Of Early-Life Cotinine On Pulmonary Function In Asthmatic, Atopic, And Healthy Seven Year Olds. Am. J. Respir. Crit. Care Med. 183: A4026, May 2011

**Abstracts**, continued:

Kyungmin Jacob Cho, Leonid Turkevich, Matthew Miller, **Roy McKay**, Sergey A. Grinshpun, KwonChul Ha, and Tiina Reponen. Fiber and spherical particle penetration through N95 filtering facepiece respirators with cyclic flow. Submitted June 2011 to NORA 2011 conference in Cincinnati, OH.

Grinshpun S, Cho K, Miller M, McKay R, Reponen T, Turkevich L, Ha K. Penetration of Fibers Through Faceseal Leakage of N95 Filtering Facepiece Respirators. Respiratory Protection podium session (PO 123) presented at the American Industrial Hygiene Conference and Exposition (AIHce) in Indianapolis, IN on June 20, 2012.

**Abstracts Submitted:**

Huang Sheng-Hsiu, Chun-Wan Chen, Yu-Mei Kuo, Chane-Yu Lai, **Roy McKay**, Chih-Chieh Chen. Factors Affecting Filter Penetration and Quality Factor of Particulate Respirators. Submitted to the 18th ISRP International Conference in Yokohama, Japan. Accepted September 6, 2016.

## **Reviewer for Peer Review & Governmental Publications:**

**Journal of Occupational Medicine.** Bronchoprovocation Challenge Testing Methods, Procedures, and Measurement of Lung Function.

**U.S. Environmental Protection Agency's "Health Assessment Document for Toluene Diisocyanate",** September, 1988.

**Toxicology and Applied Pharmacology.** Uptake and distribution of C14 during and following inhalation exposure to radioactive toluene diisocyanate (TDI). January 1989.

**Journal of Occupational Medicine.** Toluene Diisocyanate Induced Asthma. Clinical Findings and Bronchial Responsiveness Studies in 113 Exposed Subjects with Respiratory Work Related Symptoms. June 1990.

**American Industrial Hygiene Association Journal.** Comparison of Respirator Fit Test Methods: Condensation Nucleus Counter Vs. Aerosol Photometer. October 1992.

**American Industrial Hygiene Association Journal.**  
Determination of Known Respirator Leakage Using Controlled Negative Pressure and Ambient Aerosol QNFT Systems. November 1992.

**Applied Occupational and Environmental Hygiene**  
A Validation Study of Respirator Fit Testing By Controlled Negative Pressure. January 1993.

**Occupational Health & Safety**  
Respiratory Safety in Confined Spaces. April 1993.

**Journal of the International Society for Respiratory Protection**  
Determination of respirator fit by an aerosol method and a negative pressure method. April 1993.

**American Industrial Hygiene Association Journal.**  
Design of Respirator Masks to Incorporate Physiological Effects: A Review. March 1994.

**American Journal of Respiratory and Critical Care Medicine.**  
Official reviewer of the ATS Statement on "Respiratory Protection Guidelines". American Thoracic Society (ATS) is the Medical Section of the American Lung Association. September, 1995.

**Journal of the International Society for Respiratory Protection.**  
A New Method for Validation of Respirator Fit Test Systems. March, 1996.

**Reviewer for Peer Review Publications:** continued

**American Thoracic Society Pulmonary Function Lab Manual.**

Edited by Jack Wanger, National Jewish Medical and Research Center. June 1997.

**National Health Lung Education Program.** Reviewer for:

Health Assessment Using Simple Lung Function Testing at the request of the American Thoracic Society - Laboratory Proficiency Committee, August 1997.

**American National Standards Institute (ANSI).** Reviewer for:

"American National Standard for Color Coding of Air Purifying Respirator Canisters, Cartridges and Filters. June 1998.

**American National Standards Institute (ANSI).** Reviewer for:

"Performance Criteria and Test Methods for Air-Purifying Respirators". ANSI Z88.8, August 1998.

**American National Standards Institute (ANSI).** Reviewer for:

"American National Standard for Respiratory Protection - Infectious Aerosols". ANSI Z88.12, August, 1998.

**OSHA.** Reviewer for "Anthrax in Medical Facilities". Provided specific recommendation and comments regarding respiratory protection issues. February 2002.

**AMA Guides to the Evaluation of Permanent Impairment, 6<sup>th</sup> edition.**

Chapter 5 - Pulmonary system. 2008.

## Invited Presentations at International, National, & Regional Meetings

23rd Aspen Lung Conference. Presentation: "**Isocyanate Induced Abnormality of beta-Adrenergic Receptor Function**". Aspen, Colorado. June 1980.

International Isocyanate Institute Conference on Immunologic Aspects of Isocyanates. Presentation: "**Beta-adrenergic Studies with Isocyanates: biochemical and physiologic studies**". Pittsburgh, Pennsylvania. December 8, 1980.

American Lung Association/American Thoracic Society Annual Meeting. Presentation: "**Toluene Diisocyanate (TDI): Biochemical and Physiologic Studies**". Detroit, Michigan. May 9, 1981.

American Industrial Hygiene Association - Ohio Valley Local Section. Presentation: "**Pharmacologic Investigation of Isocyanate-induced Airways Disease**". Cincinnati, Ohio. February 8, 1983.

University of Saskatchewan, Canada. Presentation: "**Hyperreactive Airway Responsiveness Following Inhalation of Toluene Diisocyanate (TDI) Vapors**". Saskatoon, Canada. March 18, 1983.

American Thoracic Society Annual Meeting. Presentation: "**Induction of Tracheal Smooth Muscle Hyperresponsiveness to Carbachol Following Exposure to Toluene Diisocyanate Vapors**". Kansas City, Missouri. May 10, 1983.

**Mechanisms of Bronchial Hyperreactivity.** Occupational Toxicology and Respiratory Disease Conference. January 12-15, 1984. Park City, Utah.

**Toluene Diisocyanate Asthma.** Occupational Toxicology and Respiratory Disease Conference. January 12-15, 1984. Park City, Utah.

**Mechanisms of Asthma and Hypersensitivity Pneumonitis.** American Occupational Medical Association Annual Meeting, Kansas City, Missouri. April 1985.

**Bronchoprovocation Challenge Testing.** American Occupational Medicine Association Annual Meeting. Kansas City, Missouri. April 1985.

**Use of Bronchoprovocation Challenge Testing for the Detection of Isocyanate Sensitive Workers.** American Industrial Hygiene Conference. Dallas, Texas. May 21, 1986.

## **Invited Presentations at International, National, & Regional Meetings, cont.:**

**Use of Bronchoprovocation Challenge Testing for the Detection of Occupational Airway Disorders.** American Academy of Occupational Medicine Annual Conference on Occupational Health. Washington, DC. November 13, 1986.

**Neurotoxicology Case Studies.** 39th Annual Meeting of the American Academy of Neurology, New York City, April 10, 1987.

**Pulmonary Toxicology.** American Industrial Hygiene Association (Ohio Valley Section). February 9, 1988.

**Neurotoxicology Case Studies.** 40th Annual Meeting of the American Academy of Neurology, Cincinnati, Ohio. 3.0 hours. April 22, 1988.

**Lung Toxicology and Disease.** Presented at the National Annual Meeting of the American Industrial Hygiene Conference. San Francisco, California. 4.0 hours. May 15, 1988.

**FVC End of Test Criteria: Analysis of Volume-Time Changes.** Annual Meeting of the American Thoracic Society (ATS). Cincinnati, Ohio. May 17, 1989.

**Lung Toxicology and Disease.** National Annual Meeting of the American Industrial Hygiene Association Conference. St. Louis, Missouri. 4.0 hours. May 21, 1989.

**Radiographic Determination of Total Lung Capacity.** American Industrial Hygiene Association. Orlando, Florida. May 16, 1990.

**Advanced Spirometry.** American Occupational Health Conference. Post Graduate Course (8 hours). Houston, Texas. May 1990.

**An Industry-wide Pulmonary Morbidity Cohort Study of Workers Manufacturing Refractory Ceramic Fibers.** Presenting Author: James Lockey, MD. 23rd International Congress on Occupational Health, Montreal, Canada. September 25, 1990.

**Toxicology.** American Industrial Hygiene Association's Manitoba Section Symposium. Winnipeg, Canada. October 16, 1991.

**Respirator Fit During Exercise.** American Industrial Hygiene Conference & Exposition. Boston, MA. Jun 1, 1992.



## **Invited Presentations at International, National, & Regional Meetings, cont.:**

### **Epidemiologic Use of Radiographic Measurement of Total Lung**

**Capacity (TLC) In An Asbestos Exposed Population.** American Industrial Hygiene Conference & Exposition. Boston, MA. June 2, 1992.

### **Visual Field Loss While Wearing Full Face Respiratory**

**Protection.** American Industrial Hygiene Conference & Exposition. Boston, MA. June 3, 1992.

### **Quality Assurance of Data Collection: Using Pulmonary Function Data as an**

**Example.** At: Medical Surveillance: State of the Art. Postgraduate seminar #1. American Occupational & Environmental Health Conference, Atlanta GA. April 27, 1993.

### **Medical Surveillance Panel Presentation.**

At: Medical Surveillance: State of the Art. Postgraduate seminar #1. American Occupational and Environmental Health Conference, Atlanta GA. April 27, 1993.

### **Respiratory Protection: Current Topics In Health & Safety...**

**New Directions.** Central Ohio Section of AIHA, April 29, 1993.

### **Use and Limitations of Respiratory Protective Equipment for**

**Prevention of Occupationally Related Illnesses.** Presented at the 1993 National Seminar on Preventing Occupational Injuries, Diseases and Disability, sponsored by the Occupational Medical Digest. Tampa, Florida. October 7, 1993.

### **Respiratory Protection for the Health Care Industry:**

**Tuberculosis.** Presented at the Multi-Drug Resistant Tuberculosis Workshop. Sponsored by the American Industrial Hygiene Association - Prairie Section. 3.5 lecture hours. Peoria, IL. October 13, 1993.

### **Pulmonary Function Testing.**

Presented at the 1994 annual P&G Far East Occupational Medical Meeting. 8.0 lecture hours. Kobe, Japan. February 21, 1994.

### **The Use of Respiratory Protective Equipment for Prevention of Occupational**

**Related Illnesses.** Presented at the 1995 Oregon Governor's Occupational Safety & Health Conference. 4.5 lecture hours. Portland, OR. March 6, 1995.

## **Invited Presentations at International, National, & Regional Meetings, cont.:**

### **Hazard Assessment with a Focus on Personal Protective**

**Equipment.** Presented at the 1995 Oregon Governor's Occupational Safety & Health Conference. 2 lecture hours. Portland, OR. March 6, 1995.

### **Use and Limitations of Respiratory Protective Equipment.**

Presented at the 1995 Oregon Governor's Occupational Safety & Health Conference. 1 lecture hour. Portland, OR. March 7, 1995.

### **Respiratory Protection: Uses & Limitations.**

Presented at the Kitty Hawk Chapter of the American Society of Safety Engineers. Dayton, OH. March 29, 1995.

### **Respiratory Protection: Pitfalls and Controversies.**

Presented at the scientific session "Respiratory Protection Update" at the American Occupational Health Conference, Las Vegas, NV. May 4, 1995.

### **Office Spirometry as Diagnostic and Management Tool.**

Presented at Med Ohio. Columbus, OH. May 18, 1995.

### **Respiratory Protection.**

Presented at the H.E.S. Conference for Bayer Corporation. 2 hours, Pittsburgh, PA, October 3, 1995.

### **Spirometry Training for Physicians and Workshop.**

Latin American Occupational Health Conference. 16 Contact Hours. Mexico City, Mexico. October 19 & 20, 1995.

### **Pulmonary Function Testing Workshop for Physicians and**

**Nurses.** Procter & Gamble European Occupational Health Conference. 16 lecture hours plus 16 workshop hours. Approximately 70 physicians and nurses representing 17 different countries. Frankfurt, Germany. February 12 - 15, 1996.

### **Keynote Speaker: Respiratory Protection.**

Presented at the Greater Calumet Chapter of the American Society of Safety Engineers and Partners in Care. Chicago (Hammond, IN), April 12, 1996.

### **What's New in Respiratory Protection?**

Presented at the AIHA Ohio Valley Section meeting. Cincinnati, OH. May 14, 1996.

### **Spirometry for Physicians.**

Presented at the American College of Occupational and Environmental Medicine State of the Art Conference. 7 hours. Toronto, Canada. October 28, 1996.

## **Invited Presentations at International, National, & Regional Meetings, cont.:**

### **Pulmonary Function Testing Workshop for Physicians and**

**Nurses.** Tastemaker Co. 8 lecture hours plus 8 workshop hours. Milton Keynes, England. November 20, 21, & 22, 1996.

### **Respirator Fit Testing & Program Update.**

1 hour presentation to the Greater Hamilton Safety Council, Hamilton, OH. Dec 4, 1996.

### **Spirometry Standards for Clinicians.**

4 hour presentation given at the 38th U.S. Navy Occupational Health and Preventive Medicine Workshop. Virginia Beach, Virginia. February 9, 1997.

### **Myths and Facts About Respiratory Protection.**

Presented to the Southwestern Ohio Chapter of the American Society of Safety Engineers. Cincinnati, OH. February 10, 1997.

### **Interpreting Spirometry: The Clinical Evaluation.**

4 hour presentation given at the 38th U.S. Navy Occupational Health and Preventive Medicine Workshop. Virginia Beach, Virginia. February 9, 1997.

### **Determination of True Change in Lung Function.**

Presented to the Western Ohio Occupational and Environmental Medical Association. Co-Sponsored by the American College of Occupational and Environmental Medicine. Columbus, OH. March 8, 1997.

### **Update on Respiratory Protection: New Standards and**

**Guidelines.** Presented at the All-Ohio Safety and Health Congress and Exhibit. Columbus Convention Center, Columbus, OH. March 26, 1997.

### **Spirometry for Physicians.**

Presented at the American Occupational Health Conference for the American College of Occupational and Environmental Medicine. 7 hours. Orlando, FL. May 13, 1997.

### **Interpretation and Use of Pulmonary Function Tests in**

**Internal Medicine.** Presented to the Faculty, Residents, and Attending Physicians at the Michigan State University (Internal Medicine program). 7.5 contact hours. East Lansing, Michigan. June 5, 1997.

## **Invited Presentations at International, National, & Regional Meetings, cont.:**

### **Respirators & Respiratory Protection.**

Postgraduate seminar presented at the State of the Art Conference. American College of Occupational and Environmental Medicine. 7 hours. Nashville, TN. October 26, 1997

### **Respiratory Protection & Fit Testing Workshop.**

Fisher Controls Governor Road Occupational Health Nurse's Conference. 8 hours. Marshaltown, Iowa. November 15 & 16, 1997.

### **Spirometry for Physicians.**

Presented at the American Occupational Health Conference for the American College of Occupational and Environmental Medicine. 7 hours. Boston, MA. April 28, 1998.

### **Capability of Aerosolized Qualitative Fit Test Agents (Sweetener and Bitrex) to Detect Known Leakage in Half Mask Respirators.**

Presented at the annual meeting of the American Industrial Hygiene Conference & Exposition, Atlanta, GA. May 14, 1998.

### **An Evaluation of Pressure-Monitored User Seal Checks in Detecting Industrial Respirator Leakage.**

Co-author of paper presented at the annual meeting of the American Industrial Hygiene Conference & Exposition, Atlanta, GA. May 14, 1998.

### **Asthma, Airway Hyperreactivity & Lung Diseases that Masquerade as Asthma:**

Presented at the AIHA Ohio Valley Section meeting. Cincinnati, OH. May 19, 1998.

### **Respiratory Protection Overview & Update.** Eleventh Annual

Occupational Safety & Health Conference. 16 hours. Oakland, CA. August 6 & 7, 1998.

### **Respiratory Review.** Kimberly Clark Occupational Health

Conference. 5 hours. Neenah, WI. October 21, 1998.

### **Respirators and Respiratory Protection in the Workplace.**

40th Annual Occupational Health Symposium. Occupational Health Update: Maintaining a Healthy Workplace. 2 Hours. Louisville, KY. November 7, 1998.

## **Invited Presentations at International, National, & Regional Meetings, cont.:**

**Medical Surveillance and Pulmonary Function Testing In Industry.** 1999 UAW-GM Annual Joint Health & Safety Training Conference. 7.5 lecture hours. Palm Springs, California. January 17, 1999.

**OSHA's New Respirator Standard** Presented at the 8th Annual Environmental Symposium, Cincinnati, OH. March 31, 1999.

### **Respirators & Respiratory Protection.**

Postgraduate seminar presented at American Occupational Health Conference (AOHC). the State of the Art Conference. American College of Occupational and Environmental Medicine. 7 hours. New Orleans, LA. April 27, 1999.

### **How to Get and Interpret a Pulmonary Function Test.**

1999 Midyear Educational Conference. American Osteopathic College of Occupational & Preventive Medicine. Kansas City, MO. April 23, 1999.

### **Respiratory Protection.**

Annual Occupational Health Update. Brush Wellman Inc. Kenyon College, Gambier, OH. 4.0 lecture hours, June 17, 1999.

### **Respirator User Seal Checks: Use, Limitations, and Defining**

**a Standard Method.** International Society for Respiratory Protection, 9th International Conference, Pittsburgh, PA. October 13, 1999.

### **Practical Aspects of Pulmonary Function Testing in Industry.**

A two day training program and workshop for physicians and nurses attending the P&G Latin America Occupational Health Conference. Caracas, Venezuela. October 21 & 22, 1999.

### **Spirometry Standards & Interpreting Spirometric Results.**

40th Navy Occupational Health and Preventive Medicine Workshop. 7 hours. Norfolk, Virginia. February 2, 2000.

**Determination of Known Exhalation Valve Damage Using a Negative Pressure User Seal Check Method on Full Face Respirators.** Presented by Lisa Delaney, MS. at the American Industrial Hygiene Conference & Exposition. Orlando, Florida, May 25, 2000.

**An Evaluation of a Qualitative Fit Test Agent (Bitrex) to Detect Exhalation Valve Leakage in Full Facepiece Respirators.** Presented at the American Industrial Hygiene Conference & Exposition. Orlando, Florida, May 25, 2000.

## **Invited Presentations at International, National, & Regional Meetings, cont.:**

**Key Points to PFT Interpretation.** Presented at the Ohio Association of Occupational Health Nurses, Inc. Mason, Ohio. October 14, 2000.

**Pulmonary Function Testing & Workshop.** Presented at the European Medical Meeting for Procter & Gamble (16 contact hours). Frankfurt, Germany. January 15-17, 2001

### **Interpretation of Lung Function Testing.**

Presented at the 2001 Eur Safety Net Tri-Service Workshop. Sponsored by the U.S. Army Center for Health Promotion and Preventive Medicine - Europe (CHPPM-EUR). Gut Matheshof, Rieden-Kreuth, Germany. 7 Contact Hours. March 6, 2001.

### **When Is a Change in Lung Function Significant?**

Presented at American Thoracic Society's annual meeting. Pulmonary Function Testing: Practical Issues in Procedures & Interpretation. ATS Postgraduate course number 16, San Francisco, CA, May 19, 2001.

### **An Evaluation of User Seal Checks in Determining Respirator Fit.**

Presented by Cathy Hall, MS. at the American Industrial Hygiene Conference & Exposition. New Orleans, LA, June 6, 2001.

**A Comparison of Sodium Saccharin Versus Controlled Negative Pressure for Detecting Known Leaks in Full Face Respirators.** Presented at the American Industrial Hygiene Conference & Exposition. New Orleans, LA, June 6, 2001.

### **Why Use a Respirator - They Don't Work Anyway, Do They?**

Presented at the Ohio Valley Section meeting of the American Industrial Hygiene Association. Cincinnati, OH. September 11, 2001.

### **Design, Use, & Interpretation of Pulmonary Function Tests for Workplace Studies.**

Presented at the National Institute for Occupational Safety and Health (NIOSH) - Centers for Disease Control (CDC), Alice Hamilton Laboratory, Ridge Road, Cincinnati, Ohio. 7 Lecture hours. September 21, 2001.

### **Respiratory Protection and Fit Testing Workshop.**

Presented to the Los Alamos National Laboratory, Environmental Safety & Health Office, Los Alamos, New Mexico. 16 Lecture hours. December 17 & 18, 2001.

## **Invited Presentations at International, National, & Regional Meetings, cont.:**

### **Current Topics in Respiratory Protection.**

Presented at the Hanford Nuclear Reservation, Richland, Washington. 7.5 hours. January 10, 2002.

### **Quantitative Fit Testing - Respiratory Protection in the Workplace.**

Presented to University Health Services, Environmental Health & Safety. May 8, 2002.

### **Determination of Known Exhalation Valve Leakage Using an Irritant Smoke Test Kit.**

Presented by Erin Snyder, MS. at the American Industrial Hygiene Conference & Exposition. San Diego, CA, June 5, 2002.

### **An Update in Respiratory Protection with Practical Guidelines for Responding to Chemical and Biological Agents.**

Presented to the Centers for Disease Control, National Institute for Occupational Safety & Health (CDC/NIOSH). Cincinnati, OH, June 28, 2002

### **Protecting Your Health: Current Topics in Respirators & Fit Testing.**

American Indoor Air Quality Council - Dayton Chapter, Cincinnati, OH April 23, 2003.

### **Evaluation of the Workplace Protection Factors (WPFs) of N95 facepiece respirators against fungal spores using non-biological particles as simulants.**

SA Lee, A Adhikari, SA Grinshpun, K Willeke, **R McKay**, R Shukla, A Maynard, & T Reponen. Presented by Shu-An Lee at the University of Cincinnati NIOSH Supported ERC Fourth Annual Research Symposium. Cincinnati, OH. October 17, 2003.

### **Respirator Selection and Cartridge Change Schedules**

**R McKay**. Presented to the Los Alamos National Laboratory, Environmental Safety & Health Office, Los Alamos, New Mexico. 8 Lecture hours. February 23 and April 20, 2004.

### **How to Increase the Protection Factor Provided by Existing Facepiece Respirators Against Airborne Viruses: A Novel Approach.**

Grinshpun SA, Lee BU, Yermakov M, **McKay RT**. Presented by Grinshpun SA, Budapest, Hungary. September 6, 2004

## **Invited Presentations at International, National, & Regional Meetings, cont.:**

### **A Consultant's Perspective on Respirator Program Evaluations and Audits**

**R McKay.** Presented at the Respirator Roundtable #222 of the American Industrial Hygiene Conference and Exposition (AIHce) , Atlanta, Georgia, May 11, 2004.

### **Evaluation of a New Method for Assessing the Efficiency of Respirators Against Fungal Spores in Agricultural Environments.**

T Reponen, SA Lee, A Adhikari, **R McKay**, SA Grinshpun. Presented at the American Industrial Hygiene Conference and Exposition (AIHce) , Atlanta, Georgia, May 12, 2004.

### **CBRN Respirator Leakage: Donning, Fit, and Fit Testing Issues.**

**R McKay.** Presented at the Roundtable #241 entitled Industrial Hygiene Issues with Chem-Bio Agents: PPE and Respiratory Protection. American Industrial Hygiene Conference and Exposition (AIHce) , Atlanta, Georgia, May 13, 2004.

### **Respiratory Protection: Update on Issues and Trends.**

**R. McKay.** Presented to the Washington Institute for Safety and Health Administration (WISHA) annual conference, 3 contact hours. Yakima, WA, August 12, 2004.

### **Respirator Fit Testing Workshop.**

**R. McKay.** Presented to the Commonwealth Health Corporation, 15 contact hours, Bowling Green, KY. Presented on August 18 & 19, 2004.

### **Update on Respiratory Protection**

**R. McKay.** Presented to the National Institute for Occupational Safety and Health (NIOSH/CDC). 2.0 Contact hours on August 27, 2004.

### **Respirator Cartridge Change-Out Schedule Workshop**

**R. McKay.** Presented to the National Institute for Occupational Safety and Health (NIOSH/CDC). 4.0 Contact Hours. 0.5 ABIH Industrial Hygiene CM Points Approval #: 04-1738. August 27, 2004.

### **Evaluation of Respirator Fit Test Methods.**

**Roy McKay.** Presented at: Respiratory Protection for Airborne Infectious Agents. Hosted by the Centers for Disease Control (CDC), Atlanta, GA. November 30, 2004.

### **Factors Affecting Respirator Wearers and How Those Issues are Addressed in the Medical Clearance Program.**

**Roy McKay.** Presented at the AIHA-Connecticut River Valley Local Section Professional Development Course entitled Recent Developments in Respiratory Protection a one day course. Hartford, CT. 2.25 hours, April 6, 2005.



## **Invited Presentations at International, National, & Regional Meetings, cont.:**

Laferty E, **McKay R.** Oxygen and Carbon Dioxide Levels During Qualitative Respirator Fit Testing. American Industrial Hygiene Conference and exposition, Anaheim, CA, May 25, 2005

**Evaluation of Three New Fit Test Protocols for Use with the TSI PortaCount.** **McKay RT,** Bradley J. American Industrial Hygiene Conference and Exposition, Chicago, IL, May 15, 2006.

**Respiratory Protection, Program, and Medical Requirements.** Presented at the annual “Kenneth V. Dodgson” lecture to University of Rochester Occupational and Environmental Medicine Grand Rounds. Rochester, NY, May 25, 2006.

**Update on Respirator Medical Clearance Requirements and Update on the 2005 ATS-ERS Spirometry Guidelines.** Presented to the National Institute for Occupational Safety and Health (NIOSH/CDC). 3.0 Contact Hours. Cincinnati, Ohio, August 23, 2006.

**2005 ATS-ERS Spirometry Update, Approved Training and a Standard Data Format.** Presented by special invitation at the 2006 European Respiratory Society (ERS) International Conference Symposium entitled: Implementation of the New Standards on Clinical Pulmonary Function Testing held in Munich, Germany on September 3, 2006.

**Respiratory Fit Testing and Occupational Health.**  
Presented at the 2007 Infection Control Today Conference on Professional Development, 4.5 hours. Las Vegas, Nevada, January 26, 2007.

**Respirator Selection and Development of Chemical Cartridge Change Out Schedules.** Presented at the 46<sup>th</sup> Navy Occupational Health and Preventive Medicine Conference. 16 contact hours, Hampton Roads, Virginia. March 17 & 18, 2007.

**Spirometry for Physicians:**  
Presented to NIOSH physicians. 8.0 Contact hours, Alice Hamilton Laboratory. Cincinnati, OH. March 29, 2007.

**Respirator Fit Testing for the Industrial Hygienist:**  
Presented at the American Industrial Hygiene Conference and Exposition, PDC # 506, Philadelphia, PA, 4 lecture hours, June 3, 2007.

**Respirator Selection and Development of Chemical Cartridge Change Out Schedules.** Presented to National Institute for Occupational Safety and Health - National Personal Protective Technology Laboratory (NIOSH - NPPTL); 2 days, in Pittsburgh, PA, on June 12-13, 2007.

## **Invited Presentations at International, National, & Regional Meetings, cont.:**

### **N95s vs PAPRs: The Great Debate - Alternatives to Fit Testing**

Presented at the 34<sup>th</sup> Annual meeting of the Association for Professionals in Infection Control and Epidemiology (APIC). 3.5 Hours. San Jose, California, June 24, 2007.

### **Respirator Selection and Development of Chemical Cartridge Change Out**

**Schedules.** Presented at Cannon Air Force Base, New Mexico, July 10 & 11, 2007.

### **Respirator Fit Testing: Issues and Controversies:**

Presented to NIOSH. Alice Hamilton Laboratories, Ridge Road, Cincinnati Ohio. 3.0 lecture hours. September 28, 2007.

### **Understanding Respiratory Protection for Infection Control: N95 and PAPR.**

Presented to Northeastern Wisconsin Chapter of the Association for Professionals in Infection Control and Epidemiology, Green Bay, Wisconsin, April 8, 2008.

### **Respiratory Protection for Public Health Preparedness.**

Presented at the Symposium for Public Health Preparedness in the 21<sup>st</sup> Century, Cincinnati, Ohio. 2 hours on May 8, 2008.

### **Overview of Respiratory Protection.**

Presented to the Bureau of Land Management's annual safety & health conference. Newport, Oregon. 8 hours on May 28, 2008.

### **Tech Talks: Update on Color Coding Requirements for Respirator Cartridges, Canisters and Filters; the New NIOSH Industrial PAPR Module; QLFT and QNFT Fit Testing.**

Presented at the 2008 AIHce, Minneapolis, MN on June 4, 2008.

### **Respiratory Protection: N95 and PAPR Applications and Protection Levels.**

APIC Webinar. 1 hour. Presented June 10, 2008.

### **ATS-ERS Spirometry Update**

Presented at the 2008 Medical Professionals' Conference sponsored by the Laborers' Health and safety Fund of North America. St. Charles, IL. 4 hours. August 9, 2008.

### **Respirator Inspection and Mixture Change Out Schedule Update**

Presented to CDC/NIOSH. Alice Hamilton Laboratories, Ridge Road, Cincinnati Ohio. 3.0 lecture hours. September 15, 2008.

## **Invited Presentations at International, National, & Regional Meetings, cont.:**

### **Respiratory Protection for Diacetyl and Food Flavorings**

Presented at the Professional Conference on Industrial Hygiene (PCIH) Thinkshop.  
Diacetyl and Food Flavorings: Exposure Assessment, Control, and Medical Monitoring Challenges. Tampa, FL. November 10, 2008.

### **Protection Offered by Filtering Facepiece Particulate Respirators and Surgical**

**Masks:** Lessons from Manikin and Human Subject Studies. Grinshpun SA, Haruta H, McKay R, and Reponen, T. 36th annual conference of the Association for Professionals in Infection Control, June 2009.

### **Spirometry Interpretation and Evaluation of Potential Change**

Presented at the Lung Health and Tobacco Cessation Conference, Columbus, Ohio. 4 Contact hours. May 29, 2009.

### **Interpretation of Spirometry - Beyond the Numbers:**

Presented at the 2010 Tri-State Occupational Medicine Association conference in Columbus, Ohio. 8.0 hours. October 1, 2010.

### **Dilemmas in Epidemiology of Lung Function.**

Presented at Pulmonary Grand Rounds, University of Cincinnati College of Medicine. Cincinnati, Ohio. 1.0 hours. April 4, 2011.

### **Current Topics in Respiratory Protection**

Presented to: NASA Occupational Health  
1.0 hour Webinar, April 6, 2011

### **Are You Able to Breathe? - Respiratory Protection**

Presented to Greater Cincinnati Safety Council.  
1.0 hour. Cincinnati, Ohio. August 17, 2011

### **AIHce Tech Talks: Fit Testing Respirators - Ask the Experts.**

Presented at the 2012 AIHce. Indianapolis, IN, June 20, 2012.

### **Understanding and Improving Spirometry Performance: Beyond the Numbers**

Presented to West Virginia Asthma Education and Prevention Program  
6 hours. Charleston, West Virginia. August 1, 2012

### **Current Topics in Respiratory Protection**

Workshop on Filtration Efficiency and Use of Surgical Masks  
Sponsored by Taiwan Food and Drug Administration and National Taiwan University. Taipei, Taiwan. September 3, 2012.

## **Invited Presentations at International, National, & Regional Meetings, cont.:**

### **Fit testing N95 Respirators and Surgical Masks**

Workshop on Filtration Efficiency and Use of Surgical Masks  
Sponsored by Taiwan Food and Drug Administration and National Taiwan University. Taipei, Taiwan. September 3, 2012.

### **Feasibility of Replacing BFE with PFE**

Workshop on Filtration Efficiency and Use of Surgical Masks  
Sponsored by Taiwan Food and Drug Administration and National Taiwan University. Taipei, Taiwan. September 4, 2012.

### **Fit Testing Filtering Facepiece Respirators**

A one day workshop sponsored by ASYS Corporation. 6 hours.  
Taipei, Taiwan. September 5, 2012.

### **Respirator Fit Testing**

A one day fit test training program sponsored by TSI Corporation.  
Sacramento, CA. October 11, 2012.

### **Respirator Fit Testing - Beyond the Numbers**

A 1-day program given to State of Washington, Department of Labor & Industries, Tukwila, WA. August 6, 2013.

### **Overview of Respiratory Protection and Program Administrator Responsibilities**

2- day program given to Duke Energy, Kings Mountain, NC. August 12-13, 2013.

### **Respirator Selection and Development of Chemical Cartridge Change-out Schedules**

2-days (15 contact hours) given to Sandia National Laboratories, Albuquerque, New Mexico. August 27-28, 2013.

### **Spirometry Surveillance and Screening Issues**

Presented by invitation to the US DoD Defense Health Board, Deployment Pulmonary Health tasking. Falls Church, VA (Washington DC area), February 12, 2014.

### **Fundamentals of Respiratory Protection, Importance of Fit and Non-wear Time**

Keynote presentation and panelist presenter at the 2014 Education and Research Center (ERC) Topical Workshop on Respiratory Protection in Healthcare Environments. At College of Nursing, University of Cincinnati. February 28, 2014

### **Interpretation of Spirometry training course (8 hours)**

Presented to the Air Force Occupational Medicine 2014 Symposium at Wright Patterson Air Force Base, Dayton, OH. March 19, 2014

## **Invited Presentations at International, National, & Regional Meetings, cont.:**

**Manikin-Based Performance Evaluation of Elastomeric Respirators Against Combustion Particles.** John White Award presentation at the 2104 AIHce Respirator Podium session, San Antonio, Texas , June 3, 2014.

**Interpretation of Spirometry: Beyond the Numbers** training course (7.5 hours)  
Presented to the National Institute for Occupational Safety & Health (NIOSH). Alice Hamilton building, 5555 Ridge Ave, Cincinnati, OH 45213. August 26, 2014.

**Quantitative Fit Testing Workshop for Filtering Facepiece Respirators.**  
Presented at Cincinnati Children's Hospital Medical Center (6.5 & 7.5 hours). Cincinnati, OH. June & October 2013 and June & September 2014.

**Fit Testing Refresher & Advanced Topics.**  
Presented at the annual Jefferson County Regional Fire School Conference. 7.5 hours. Galt House Hotel, Louisville, KY September 25, 2014.

**Interpretation of Spirometry** training course (8 hours)  
Presented to the Air Force Occupational Medicine 2015 Symposium at Wright Patterson Air Force Base, Dayton, OH. March 18, 2015.

**Quantitative Fit Testing Workshop for Filtering Facepiece Respirators.**  
Presented at St. Elizabeth Hospital (7.5 contact hours). Edgewood, KY. July 22, 2015.

**An Overview of Respirator Selection & Development of Cartridge Change-Out Schedules.** 1-day (6.3 contact hours) Presented to the National Institute for Occupational Safety & Health (NIOSH). Alice Hamilton building, 5555 Ridge Ave, Cincinnati, OH. August 25, 2015.

**Respirator Selection & Development of Cartridge Change-out Schedules**  
A 2-day program given to State of Washington, Department of Labor & Industries, Tukwila, WA. April 5 & 6, 2016.

**Breathe Easy: Vital Elements to an OSHA Compliant Respiratory Protection Program** 1-hour webinar provided by Progressive Business Executive Education. June 3, 2016.

**Respirator Selection & Development of Cartridge Change-out Schedules**  
A 2-day program given to NIOSH / NPPTL Pittsburgh staff in Cincinnati on November 30 & December 1, 2016.

**Development of Chemical Cartridge Change-out Schedules**  
A 1-day program given to Los Alamos National Laboratory, in Los Alamos, New Mexico, December 6, 2016.

## **Invited Presentations at International, National, & Regional Meetings, cont.:**

### **Respirator Program Administrator Training**

4-day program given to County of Sacramento California, Risk and Loss Control Division. Sacramento, CA. August 20-23, 2018.

### **Interpretation of Spirometry and Assessment of Significant Change**

WebEx presentation (2.5 hours) given to P&G Asia and IMEA regional medical meeting. April 10, 2019.

### **How to Administer Respirator Fit Tests Using Sweet &/or Bitter Solutions**

YouTube Video released March 2020.

<https://www.youtube.com/watch?v=FxpVsm3OhLY&t=14s>

**Understanding Respirator Fit Testing for Home Health Care.** Webinar developed for Maryland Emergency Preparedness Network. Presented July 23, 2020.

### **Respiratory Protection Issues & Lessons During COVID-19**

Presented to the AIHA-OVS local section, 1.5 hours, October 15, 2020

**Respirator Fit Testing Errors and Solutions.** American Conference for Governmental Industrial Hygienists (ACGIH). Webinar. January 26, 2022.

**Common Respirator Fit Testing Errors and Solutions.** Presented to the Canadian Aerosol Transmission Coalition; Occupational Health Clinics for Ontario Workers (OHCOW), Canada. Webinar presented October 14, 2022.

<https://www.ohcow.on.ca/posts/why-respirators-seal-and-fit-really-matter-2/>

<https://www.youtube.com/watch?v=EJItt8S6VvQ>

### **An Overview of Respiratory Protection for Public Health Employees.**

An 8 hour presentation given to Hazard Evaluations and Technical Assistance Branch (HETAB), Division of Field Studies and Engineering (DFSE), National Institute for Occupational Safety and Health (NIOSH), in Cincinnati, OH on July 17, 2023.

### **Voluntary Use of a Respiratory Protection and Common Fit Testing Errors**

Presented to the American Society of Safety Professionals - Southwestern Ohio Chapter. 2 hours. Zoom presentation. October 10, 2023.

### **Recent Changes to ATS-ERS Spirometry Standards from an Occupational Perspective**

Presented to the Tri-State Occupational Medicine Association (TSOMA) Annual Education Conference in Cincinnati, Ohio on October 27, 2023.

## **National Presentations: Post Graduate Course Offerings**

### **Advanced Spirometry:**

American Occupational Health Conference.

7 Contact Hours.

May 3, 1992	Washington DC
April 25, 1993	Atlanta, GA
April 17, 1994	Chicago, IL
April 31, 1995	Las Vegas, NV
April 28, 1996	San Antonio, TX
May 11, 1997	Orlando, FL
April 27, 1998	Boston, MA
April 25, 1999	New Orleans, LA
May 14, 2000	Philadelphia, PA
April 22, 2001	San Francisco, CA
April 14, 2002	Chicago, IL
May 4, 2003	Atlanta, GA

### **Occupational Lung Diseases:**

American Occupational Health Conference.

3.5 Contact Hours.

May 2, 1992	Washington DC
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### **Respirators and Respiratory Protection:**

American Occupational Health Conference.

Full Day beginning 2001

May 2, 1992	Washington DC
April 26, 1993	Atlanta, GA
April 18, 1994	Chicago, IL
April 31, 1995	Las Vegas, NV
April 29, 1996	San Antonio, TX
May 12, 1997	Orlando, FL
April 28, 1998	Boston, MA
April 26, 1999	New Orleans, LA
May 15, 2000	Philadelphia, PA
April 23, 2001	San Francisco, CA
April 15, 2002	Chicago, IL
May 5, 2003	Atlanta, GA
April 28, 2008	Salt Lake City, UT

## **National Presentations: Post Graduate Course Offerings, continued**

### **Lung Toxicology & Disease:**

American Industrial Hygiene Conference & Exposition.  
4.0 Contact Hours.

May 31, 1992	Boston, MA
May 16, 1993	New Orleans, LA
May 22, 1994	Anaheim, CA
May 20, 1995	Kansas City, MO
May 19, 1996	Washington DC
May 18, 1997	Dallas, TX
May 9, 1998	Atlanta, GA
June 6, 1999	Toronto, Canada
May 21, 2000	Orlando, FL
June 3, 2001	New Orleans, LA

### **Medical Aspects of Respirators and Medical Clearance Examinations:**

American Industrial Hygiene Conference & Exposition.  
1.0 Contact Hours.

May 31, 1992	Boston, MA
May 16, 1993	New Orleans, LA
May 22, 1994	Anaheim, CA
May 19, 1996	Washington DC
May 10, 1998	Atlanta, GA
June 6, 1999	Toronto, Canada

### **Respirator Fit Testing for the Industrial Hygienist**

American Industrial Hygiene Conference & Exposition.  
1.0 Contact Hours.

June 3, 2007	Philadelphia, PA
Jun 1, 2008	Minneapolis, MN



## **Post Graduate Training and Education**

Pulmonary Function Testing: A NIOSH-Approved Training Program. University of Cincinnati, Ohio. August 1980.

Hazardous Materials Incidence Response. U.S. Environmental Protection Agency. Certificate of Training No. 165.1. Cincinnati, Ohio. June 1981.

Reproduction: The New Frontier in Occupational and Environmental Health Research. Post Graduate Course, Rocky Mountain Center for Occupational and Environmental Health, Salt Lake City, Utah. April 1983.

Occupational Toxicology and Respiratory Diseases. Post Graduate Course, University of Utah. January 1984.

IH Sampling Strategies and Statistics. Post Graduate Course, University of Cincinnati, Ohio. March 1984.

Hazardous Waste Management. NIOSH sponsored (1.8 CEU's). Kings Island, Ohio. August 1984.

Hazard Communication: A Toxicological Viewpoint. Sponsor: Am. Industrial Hygiene Assoc. Chicago, December 1985.

Asbestos: Building Survey/Hazard Assessment. Georgia Institute of Technology, March 25-26, 1986.

Real Time Measurement of Aerosols. University of Cincinnati, 2.8 CEU's. June 17-20, 1986.

Comprehensive Review for Industrial Hygiene Professionals. University of Cincinnati, 4.0 CEU's. August 4-8, 1986.

Respirator Fit Testing. University of Cincinnati, 1.4 CEU's. September 22-23, 1986.

Approved To Perform Asbestos Abatement and Safety Training. Michigan Department of Public Health, Public Act Number 147, Effective October 14, 1986. Certificate No. 199.

Welding Safety and Health. American Welding Society, 0.8 CEU's, Indianapolis, Indiana. April 7, 1987.

Establishing No-Effect Dosages. American Industrial Hygiene Conference, Professional Development Course #41. Montreal, Canada. May 31, 1987.

Chemical Hazard Evaluation. American Industrial Hygiene

## **Post Graduate Training and Education,** continued:

Conference, Professional Development Course #14. Montreal, Canada. May 31, 1987.  
Risk Assessment Principles and Applications. Sponsor: Univ. of Cincinnati, Cincinnati, OH. 0.7 CEU's. April 19, 1988.

Neurotoxicology Case Studies. Sponsor: American Academy of Neurology, 2.5 CME credit. New York, NY. April 10, 1988.

Biological Monitoring Techniques. Sponsor: Univ. of Cincinnati, Cincinnati, OH. 1.4 CEU's. March 22-23, 1989.

Electrocardiography (ECG) Reading & Interpretation (Assessment Techniques).  
University of Cincinnati, 3 Graduate Credits, Winter Quarter 1990.

Exercise Prescription Writing & Implementation. University of Cincinnati, 3 Graduate Credits, Spring Quarter 1990.

Preventing Occupational Injuries, Diseases and Disability.  
Sponsored by the Occupational Medical Digest. Tampa, Florida. October 7, 1993.

Multi-Drug Resistant Tuberculosis Workshop. Sponsored by the American Industrial Hygiene Association - Prairie Section. 8 Contact hours. Peoria, IL. October 13, 1993.

Advanced Respiratory Protection: Respirator Cartridge & Filter Testing. Sponsored by the American Industrial Hygiene Association. 8 Contact hours. Kansas City, MO. May 21, 1995.

Hazardous Waste Operations: Industrial Emergency Responders Operations Level.  
HAZWOPER 1910.120. Ohio Division of Safety & Hygiene Training Center.  
Cincinnati, OH. February 17 & 18, 1998.

National Institutes of Health (NIH) Office of Human Subjects Research. Computer-based training course on the Protection of Human Research Subjects. Serial number: 986276469. April 3, 2001.

Pulmonary Function Testing: Practical Issues in Procedures & Interpretation. ATS Postgraduate course number 16, 7 hours. San Francisco, CA, May 19, 2001.

Development of Respirator Cartridge Change Schedules. Professional Development Course #503, offered at the AIHce, San Diego, CA, June 2, 2002.

Biological and Chemical Terrorism: Recognition & Control. University of Cincinnati - American Industrial Hygiene Association South west Ohio chapter, 1.00 ABIH CM Credits. August 22, 2003.

**Post Graduate Training and Education,** continued:

Respiratory Protection for Airborne Infectious Agents. Hosted by the Centers for Disease Control (CDC), Atlanta, GA. 2 days, November 30 - December 1, 2004.

Recent Developments in Respiratory Protection a one day Professional Development Course. AIHA-Connecticut River Valley Local Section. 1.0 Industrial Hygiene CM Points. Hartford, CT. April 6, 2005.

## Honors, Awards, and Other Special Scientific Recognition:

- National Science Foundation Student Achievement Award. Waldemar Cancer Research Institute, New York. 1970.
- American Institute of Chemists, Niagara Chapter. Outstanding Senior College Chemists Award, SUNY at Oneonta. 1976.
- American Chemical Society, Committee on Professional Training. Completion of Certification requirements of the American Chemical Society, June 1976.
- National Institute of Health (NIH) non-service fellowship award, Cincinnati, Ohio. 1976-1981.
- Ohio Lung Association. Certificate of Appreciation for Outstanding Service Toward Improving Community Health in the Prevention and Control of Lung Diseases and Their Cause. Columbus, Ohio. October 30, 1981.
- Ohio Lung Association. Graduate Fellowship Award. 1981-82.
- Tri-state Air Committee, Inc. Certificate of Appreciation for Outstanding Service Toward Improving the Air Quality in Ohio, Kentucky, and Indiana. Cincinnati, Ohio. May 4, 1983.
- Co-chair American Thoracic Society Scientific Session on Occupational Asthma (Scientific Assembly on Environmental and Occupational Health). Kansas City, MO. May 8, 1983.
- Chairman: American Occupational Medical Association (AOMA), Postgraduate Seminar on Occupational Asthma and Hypersensitivity Pneumonitis. Kansas City, MO. April 15, 1985.
- Guest Advisor: Scientists' Institute for Public Information. 1984-present.
- Co-chair and Faculty Presenter: Neurotoxicology Case Studies, 39th and 40th Annual Meetings of the American Academy of Neurology, New York City, April 10, 1987, and Cincinnati, Ohio, April 22, 1988.
- Reviewer and Workshop Participant: U.S. Environmental Protection Agency's "Health Assessment Document for Toluene Diisocyanate". 1988.
- Chairman & Session Moderator: "Respiratory Protection Update", presented at the American Occupational Health Conference. Las Vegas, NV. May 4, 1995.
- Best Paper Award. Selected as the "Best Paper" appearing in the American Industrial Hygiene Association Journal for the year 1994. Award Presented by the American Industrial Hygiene Association - Michigan Section at the annual American Industrial Hygiene Conference and Exposition in Kansas City, MO on May 25, 1995.
- Reviewer of the American Thoracic Society Statement on "Respiratory Protection Guidelines". American Thoracic Society (ATS) is the Medical Section of the American Lung Association. September 1995.
- Invited Workshop Participant: CDC TB Infection Control Guidelines Revision Meeting. Provided expertise on respiratory protection for exposure to TB. Atlanta, Georgia. September 26-27, 2000 and January 23-24, 2002.
- Moderator: Respiratory Protection 2: Advances in Respiratory Protection. American Industrial Hygiene Conference and exposition, Anaheim, CA, May 26, 2005.

**Honors, Awards, and Other Special Scientific Recognition:** Continued:

John M. White Award for 2005. Respiratory Protection Provided by N95 Filtering Facepiece Respirators Against Airborne Dust and Microorganisms in Agricultural Farms. *Journal of Occupational and Environmental Hygiene*, 2:577-585, 2005.

Presented annual “Kenneth V. Dodgson” lecture to University of Rochester Occupational and Environmental Medicine Grand Rounds entitled: “Respiratory Protection, Program, and Medical Requirements”. Rochester, NY, May 25, 2006.

Institute of Medicine, National Academy of Sciences. Committee for the Assessment of the NIOSH Head-and-Face Anthropometric Survey of U.S. Respirator Users. Presentation entitled: “Respirator Fit Testing Issues”. Pittsburgh, PA, July 10, 2006.

John M. White Award for 2008. What Does Respirator Certification Tell Us About Filtration of Ultrafine Particles? *Journal of Occupational and Environmental Hygiene* 5:286-295, 2008.

David L. Swift Memorial Outstanding Aerosol Paper Award for 2008. What Does Respirator Certification Tell Us About Filtration of Ultrafine Particles? *Journal of Occupational and Environmental Hygiene* 5:286-295, 2008. Awarded by the Aerosol Technology Committee of the American Industrial Hygiene Association.

## **Professional Community Service Activities:**

Schmidlapp Math and Science Scholar Program:

Mentor for Meggie O'Donnell, Mother of Mercy High School Student. October 1993 - 1995.

Ohio Academy of Science Award: District Science Day, April 1, 1995

Sigma Xi Winner: Outstanding Environmental Exhibit, April 1, 1995

Ohio Academy of Science Award: Superior Achievement Rating: State Science Day, April 22, 1995

Ohio Nurses Association: Honorable mention, Ohio State Science Award, April 22, 1995

**Chemical Hazards to the Lungs.** Lecture presentation

provided to St. Joseph Elementary School, Cold Spring, KY. 2 Contact Hours, February 2, 1994.

**Health Effects of Cigarette Smoking.** Lecture presentation

provided to St. Joseph Elementary School, Cold Spring, KY. 1.5 Contact Hours, April 12, 1995.

**OSHA Revised Respiratory Protection Standard.**

An analysis and recommendation prepared for the American College of Occupational and Environmental Medicine. Submitted to OSHA June 12, 1995.

**Respirator Assigned Protection Factors.**

An analysis and recommendation prepared for the American College of Occupational and Environmental Medicine. Submitted to OSHA Jan 2, 1996.

## **Current Responsibilities:** (abbreviated list)

Director: Occupational Pulmonary Services within the University of Cincinnati's Center for Occupational Health. Responsibilities include the development of occupational pulmonary programs, interpretation of lung function tests, respiratory protection services, management of staff, prepare budget, technical staff training, marketing, etc.

Director: Respirator Fit Testing & Training Program at the University of Cincinnati's Center for Occupational Health.

Design, develop and participate in epidemiologic field studies for participation in pulmonary surveillance studies

Lecture to: Residents in Occupational Medicine and graduate students within the Department of Environmental Health, University of Cincinnati College of Medicine.

Assist graduate and medical student research activities.

Course Director: NIOSH Approved Spirometry Training Program (Initial & Refresher). 1983 - present.

Lecture in various Continuing Education programs.

Design and development of spirometry surveillance program for the FWMMP (Fernald Worker Medical Monitoring Program), a US DOE Superfund site. 1995 - present.

Spirometry interpretation and identification of potentially significant change in spirometry testing. More than 10,000 tests interpretations since 1995.

## **Previous Responsibilities:** (abbreviated list)

External Pulmonary Function Consultant for P&G.

Provided training, external peer review, spirometry assistance, and more than 10,000 Quality Assurance (QA) reviews, representing approximately 1,000 reports from approximately 100 global sites with a minimum of 10 PFTs per operator. Responsible for evaluating site personnel for compliance with current ATS-ERS and corporate Spirometry testing guidelines.

## **Membership in Societies**

International Society for Respiratory Protection (ISRP). 1995 - present.

American Thoracic Society (ATS), 1980-2010.

American Industrial Hygiene Association (AIHA), 1984-present.

American Conference of Governmental Industrial Hygienists (ACGIH), 1984-2010.

American Welding Society, June 1987-1988.

Ohio Thoracic Society (OHS), 1981-1985.

Tri-state Air Committee (TAC)

Member of the Board, 1980-1986.

Chairman, 1982-1983.

Scientific Advisory Committee, Chairman, 1983-1986.

Air Pollution Control Association (APCA), 1985-1986.

Ohio Valley Local Section of American Industrial Hygiene Association, 1988-2009.

Society of Toxicology: Ohio Valley Chapter, 1988- ?.

Society for Chemical Hazard Communication (Formerly: American Conference on Chemical Labeling (ACCL), 1990-1994.

## National & International Committee Assignments:

Interdisciplinary Respiratory Surveillance. Representing: American Thoracic Society (ATS), and American College of Chest Physicians (ACCP). 1985-1990.

U.S. Environmental Protection Agency's Health Assessment Document for Toluene Diisocyanate.  
August 1988-1991.

American Academy of Allergy and Immunology. Guidelines for Diagnosis and Evaluation of Occupational Lung Disease. 1988-1990.

American College of Occupational & Environmental Medicine.  
Medical Surveillance Planning Committee. 1991 - 1993.

American Industrial Hygiene Association's (AIHA) Respiratory Protection Committee.  
1991-1995 & 1997-present.

### Subcommittee Assignments (activity dates vary):

1. Quantitative Respirator Fit Testing Exercises  
Description: To review the data available on fit test exercises, to make recommendations on the appropriate exercises to use, and determine criteria to objectively evaluate pass/fail criteria.
2. Consumer Info. - Community Technical Support  
Description: Develop links with industries and other groups responsible for providing respiratory protection to the public or to workers who do not normally receive respiratory protection training (e.g., small businesses).
3. Biohazards/Respirator Sterilization  
Description: Develop guidelines for respiratory protection for biohazards and act as liaison with the Biosafety Committee of AIHA, provide input to the ANSI Committee through the subcommittee chairperson.
4. Regulatory Interpretations  
Description: Establish a mechanism to identify and disseminate changes in regulatory interpretation of respiratory protection standards and policies.
5. Respiratory Protection Course  
Description: Develop and continuously revise a two (2) day short course in respiratory protection for presentation at the annual meeting of the AIHA.
6. John D. White Award  
Description: Encourages quality research and publication in the area of respiratory protection by providing an annual award and recognition for the best respiratory protection publication for the past year in the AIHA journal.
7. Ad hoc Committee: CDC Guidelines for Preventing the Transmission of Tuberculosis in Health Care Facilities  
Description: Prepare comment for the AIHA Board regarding proposed CDC Guidelines for preventing transmission of TB in health care facilities.
8. User's Notice Committee
9. Tech Talks. 2007 - present.
10. PDC Proposal Peer Reviewer for AIHce. 2004 - present.
11. ANSI Z88.10 Liaison
12. Respirator Terminology  
Description: Develop standardized and accepted definitions for common respirator terms for use in publications, guidance documents, standards, etc. 2015 - present.



## **National & International Committee Assignments:** Continued

American Thoracic Society (ATS):  
Medical Section of the American Lung Association.  
Proficiency Standards for Clinical Pulmonary Laboratories. 1996 - 2005.

American Thoracic Society (ATS):  
Medical Section of the American Lung Association.  
Proposed new committee member to develop Standards for Assessing Injury and Impairment with Lung Function Testing. 1997 - 1998.

American Thoracic Society  
Medical Section of the American Lung Association.  
Committee member responsible for developing "Guidelines for Bronchial Challenge".  
1997 - 2000.

### **American National Standards Institute (ANSI):**

#### **ASSE/ANSI Z88 Respiratory Protection Committee Member:**

American National Standards Institute Committee on Respiratory Protection. Full committee appointment. 1998 - present.

#### **ANSI Z88.10 Respirator Fit Testing Committee:**

American National Standards Institute Committee on Respiratory Protection.  
Respirator Fit Testing Methodology, 1995 - 2001; 2005 - 2011; 2015 - present.  
Chair: 2005 through 2019

#### **ANSI Z88.6 Physical Qualifications for Persons Wearing**

##### **Respiratory Protection:**

1998 - 2006.

#### **ANSI Z88.15 Respiratory Fit Capability Test for Half-mask Air-purifying Particulate Respirators. 2016 - present**

### **American College of Occupational & Environmental Medicine (ACOEM).**

Occupational and Environmental Lung Disorders Committee. May 2000 - 2003.

### **Biodefense and Emerging Infectious Disease Work Group.**

Cincinnati, OH. 2003 - 2004.

### **ASTM International:**

ASTM F23 Committee on Personal Protective Clothing and Equipment, Subcommittee  
F23.65 on Respiratory Protection. Nov 2017 - 2019 and 2020 - present.

ASTM WK62866 Standard Test Method for Respirator Fit Capability (RFC) for  
Negative-Pressure Half-Facepiece Particulate Respirators. 2017 - 2020. Published  
F3407-20, November 2020.

ASTM Committee F23.65 on Personal Protective Clothing and Equipment.  
Subcommittee WK7374 on Respiratory Protection. Respiratory Fit Testing  
Methods 2020 - present.

ASTM Committee F23.65 Personal Protective Clothing and Equipment.  
Subcommittee WK76274 - Revision of F3502-21 Standard Specification for  
Barrier face Coverings - Quantitative Leakage Assessment Testing workgroup.  
May 2021 - present.

## University Committees

Reappointment, Promotion, and Tenure Committee. University of Cincinnati. 1986-1991.

University of Cincinnati's Asbestos Task Force, 1985-1987.

Sabbatical Leave Committee. 1987-1990.

Inhalation and Aerosol Studies Committee. 1986-1990.

Planning Committee for Clinical Center for Occupational and Preventive Medicine. 1989-1990.

University Hospital Prevention of Tuberculosis Task Force. 1993 - 1995.

University Environmental Health Foundation Practice Plan Task Force. 12/96.

Board of Trustees. University Environmental Health Foundation. 2000 - present.

Governance Task Force for Strategic Planning Committee, 2003

Strategic Planning Committee (Department of Environmental Health), 2003 - 2005.

Research, Education and Service committee (Department of Environmental Health). July 2004 to 2006.

Board of Director's: University Environmental Health Foundation 1998 - 2009.

## Graduate Student Training/Research:

### Ph.D. Qualifying Exam Committees:

Chih Chieh Chen:

Study of the Penetration Characteristics of Disposable Respirators.  
December 19, 1988.

Thomas J. Lentz:

Modification and Comparison of Pulmonary Deposition Models for Use in Predicting Health Effects of Occupational Exposures to Refractory Ceramic Fibers. October 1994.

Tania Carreon-Valencia:

Lead Exposure of Glazed Pottery Producers: Effect of an Intervention In Michoacan, Mexico. 1995 - 1996.

Jay A. Vietas:

Co-exposure of Arsenic and Benzo(a)pyrene: In Vivo effects of arsenic speciation on DNA adduct levels. 2004.

Robert Eninger:

Filtration performance of N99 and N100 facepiece device respirators against nanoparticles. 2006- 2007

Xinjian (Kevin) He:

Assessment of Face Seal Leakage in a Half-Mask Respirator Used by Firefighters. 2012.

Shuang Gao:

Performance of Facepiece Respirators and Masks against Surgical Smoke: SWPF Study. 2014.

**Ph.D. Thesis Committees:**

- Chih Chieh Chen      Aerosol Filtration and Faceseal Leakage characteristics of Filtering Facepieces. Aerosols. 1988-1991.
- Shu-An Lee            Development and Evaluation of Personal Setup in Assessing the Protection Offered by Respirators Against Dust and Fungal Spores in Agricultural Environments. 2002 - 2005.
- Robert Eninger:      Performance aspects of filtering facepiece respirators against ultrafine inert and biological particles 2007-2008.
- Xinjian (Kevin) He:    Effects of Faceseal Leakage, Combustion Material, Particle Size, Breathing Frequency and Flow Rate on the Performance of Respiratory Protective Devices. 2011 - 2013.
- Shuang Gao:            2014 - 2016.

## Master's Thesis Committees:

Chris Reh	A Laboratory and Field Evaluation of Industrial Hygiene Sampling Methods for Aerosols of Biuret of 1,6-Hexamethylene Diisocyanate. 1987-1989.
Dave Smith, MD	Radiographic Determination of Total Lung Capacity. Advisor, 1988-1990.
Douglas Linz, MD	Pulmonary Morbidity Study of Workers Exposed to a Proprietary Paper Product. 1989-1990.
Charles Simpson, MD	Determination of Spirometry Testing Side Effects Incidence Rates in a Cohort of Refractory Ceramic Fiber Workers. Advisor, 1989-1990.
Dave Johnson, MD	Application of Radiographically Determined Total Lung Capacity (TLC) in a Study of Asbestos Exposed Workers. 1990-1991.
George White, MD	A Physiologic Method for Determining Fitness to Use an industrial Respirator. Advisor, 1990-1992.
John Shively, MD	An Analysis of Spirometry, Diffusing Capacity and Exercise Capacity in Diatomaceous Earth Workers. 1990-1992.
D. Ann Middaugh, MD	Sick Building Syndrome: Medical Evaluation and Characterization of a Workforce. 1990.
Sanford Zelnick, DO	A Comparison of Visual Fields in Selected Full and Half Face Respirators. 1991-1993.
Angela Weber	Aerosol Penetration and Leak Characteristics of Masks Used in the Health Care Industry. 1991 - 1992.
Ronald Marchioni	Quantitative Fit Testing of Respirators: Dependence of Fit Factor on Probe Flow Rate. 1991 - 1992.
Christine Pippenger	Effects of a Supplied Air Respirator Helmet and a Sustained Stooped Posture on Postural Stability. 1992 - 1993.

**Master's Thesis Committees:** Continued

Thomas Forte, D.O.	Misdiagnosis of Lung Disease by Pulmonary Function Testing of Workers Who Have Had Palatal Surgery. Chair, 1995 - 1996.
Timothy Lee, MD	A Pulmonary Morbidity Study of Workers with a History of Basement Flu. 1995 - present.
Denise Agatep, MD	A Study in Early Markers of Coal Workers' Pneumoconiosis... Do They Exist?. 1995 - 1997.
Robert Boyer, MD	Change in Pulmonary Function When Testing Technicians are Accountable to an Internal Peer Review. 1995 - 1999.
Andrew Freeman, MD	An Evaluation of Pressure-Monitored Leak Checks in Detecting Industrial Respirator Leakage. 1996 - 1997.
Evan Davies, MD	Evaluation of a Denatorium Benzoate (Bitrex) Qualitative Respirator Fit Test. 1995 - 1997.
Molly Tomlin	A Comparison Between an Interviewer Administered Computer Questionnaire and a Self-Administered, Pen and Paper Questionnaire. 1997 - 1998.
Ali Lopez, MD	A New Method to Identify Excessive Hesitating Starts on Spirometry Testing. 1997 - 1998.
Cathy Hall	An Assessment of Proper Performance of User Seal Checks in a Previously Trained Group of Respirator Users. 1997 - 2000.
Carlos Rodriguez, MD	Sensitivity of Qualitative Fit Testing Using a Commercial Solution of Denatorium Benzoate in Full Face Respirators with Fixed Leaks Verified with Controlled Negative Pressure Fit Testing. 1998 - 1999.
Lisa J Delaney	Determination of Known Exhalation Valve Damage Using Negative Pressure User Seal Check Methods on Full Face Respirators. 1998 - 2000.

## **Master's Thesis Committees:** Continued

Mike Hodges	Ability of a Commercial Solution of Artificial Sweetener to determine Exhalation Valve Damage in Full Face Respirators as Compared to a Quantitative Fit Test Using Controlled Negative Pressure. 1999 - 2000.
Erin Snyder	Determination of Known Exhalation Valve Leakage Using the RespiFit™ Irritant Smoke Test Kit. 2000 - 2001.
John Dahlsten, MD	Bronchiolitis Obliterans. 2002 - 2003.
Edward Laferty	Oxygen and Carbon Dioxide levels Inside and Enclosure During Qualitative Fit Testing 2003 - 2004.
Jessica Beatty	Comparison Study Between VeriFit Irritant Smoke Generators and OSHA Recommended Irritant Smoke Tubes for Respirator Fit Testing 2006 - 2008.
Otto Rusch:	Evaluation of User's Ability to Seal Respirator Cartridges and Filters of Differing Size and Shape. Advisor and chair, 2008.
Celeste Hemphill	Comparison Study Between OSHA Rule of Thumb and Software Model Respirator Cartridge Service Life. 2008.
Julie McKibben	Hesitating start criteria redefined using the ration of back extrapolated volume to time forced expiratory volumes. 2008 - 2010 (student advisor & thesis chair).
Cory Hartman	Differences in Chemical Cartridge Change Out Schedules when Using Manufacturer Specific Change Out Software. 2009 - present (student advisor and thesis chair).

## **Graduate Fellows:**

Thomas Stauder, MD:	Human Bronchial Epithelial Cell Exposure to Toluene Diisocyanate (TDI). Dept. of Medicine, Division of Immunology. 1992.
Gregg Santilli, MD:	Human Bronchial Epithelial Cell Exposure to Toluene Diisocyanate (TDI). Dept of Environmental Health and Dept. of Medicine, Division of Immunology. 1992.

## University Teaching Experience:

- College of Medicine, University of Cincinnati:  
Pulmonary Function Testing (26-904-844). Sole Instructor, 3 graduate credits. 1984-present.
- Respirators and Respiratory Protection. 2 Grad Credits. (26-904-854) Sole Instructor, 100% effort. 1991 - present.
- Biological Effects of Air Pollution (26-904-771). 3 graduate credits. 1986-1988. Guest lecturer.
- Fundamentals of Toxicology (26-904-851). 4 graduate credits. 1983-present. Pulmonary toxicology lectures.
- Lung and The Environment. 4 graduate credits. 1983-1995. Guest lecturer.
- Introduction to Clinical Practice II. 1984-present. Guest lecturer.
- Basics of Environmental Occupational Medicine (26-OCCM-987, formerly Basics of Occupational Medicine) Guest lecturer 1988 - ~2010
- Air Pollution
  - Medical Aspects of Respirator Use
  - Overview of Respiratory Protection
- Technical Laboratory Procedures (17-035-125). University College, 2.0 credits. Mary Fox Course Director, March 1989-1993. Guest lecturer.
- Understanding the Urban Environment. College of D.A.A.P. Dr. Ransohoff course director, February 1987-1996. Guest lecturer.
- Science Technology Seminar (17-035-271). University College. 2 credits. Mary Fox course director, 2 credits, February 1989-1991.
- Occupational Health Nursing II: Practicum and Seminar (29-566-846), 1991 - 1995.
- Respiratory Protection. In "Environmental Hygiene & Safety Technology" (26-904-707) 1.5 hours/quarter. 1991 - present.
- Occupational Medicine Resident's Toxicology (course 26-905-892).  
Pulmonary Toxicology. Spring quarter, 1993 - ~2010.
- Pulmonary Research Conferences. Topics vary each year.  
Dept. of Internal Medicine, Pulmonary & Critical Care, 1992 - 1998.
- Lung Diseases and Pulmonary Function Testing. Given  
for Introduction to Biology II, course # 17-047-121, University College, Mary Fox, course director. Winter quarter, 1.5 hour/quarter, 1993 - 1996.
- Industrial Hygiene & Safety Technology. (26-904-707)  
Respiratory Protective Equipment. Glenn Talaska, course director. Fall Quarter, 1994 - ~2013. (Changed to Principles of Exposure Assessment)
- Principles of Exposure Assessment.  
Respiratory Protective Equipment. Glenn Talaska, course director. Fall Quarter, ~2014 - present.
- Pulmonary Toxicology. For Clinical Toxicology, College of Pharmacy (course # 25-820-520). 1.0 hours, Autumn quarter, 1994 - ???.
- Pulmonary & Inhalation Toxicology. For "Toxicology and Occupational Medicine". Dept. of Environmental Health course number 26-905-893. 2.0 hours/Spring quarter, 1996 - ???.
- Special Topics in Respiratory Protection: Respirator Selection and Development of Chemical Cartridge Change-out Schedules. Dept. of Environmental Health course number. 26-OCCM-790. 2004 - present.



Respiratory System Toxicology for Survey of Toxicology (TOX-7082; PH7082).  
Spring semester, Course director Mary Beth Genter, Ph.D., 2013 - 2018.

**Lecture Topics:** (Partial Listing)

Pulmonary Toxicology  
Lung Deposition, Clearance & Defense Mechanisms  
Occupational Asthma, Isocyanate Asthma  
Pulmonary Function Testing  
Toxicology (Solvents, Metals, Pesticides, etc.)  
Occupational Lung Diseases  
Asbestos Health Effects & Medical Surveillance  
Hazard Communication  
Welding Health Effects  
MSDS and labeling Requirements  
Hazard Determination  
Respirators and Respiratory Protection (multiple topics)  
Health Effects of Air Pollution

**University of Cincinnati Continuing Education Programs:**

NIOSH-Approved Spirometry Training. Course Director and Sole Instructor)  
3-Day initial spirometry training course. Usually 5 times per year.  
NIOSH-approved Spirometry Refresher. Course Director and Sole Instructor)  
1-Day course usually offered 2 times per year.  
Interpretation of Spirometry: Beyond the Numbers course  
Occupational Medicine Training Course (Formerly; "Mini-Residency in  
Occupational Medicine for Physicians")  
Pulmonary Function Testing (2 hours)  
Respiratory Protection (2 hours)  
Hazard Communication (1 hour)  
Pulmonary Toxicology (2 hours)  
Fundamentals of Industrial Hygiene  
Comp. Review for Industrial Hygiene Professionals  
C/S Asbestos Abatement Practices  
Asbestos Building Inspectors Course  
Asbestos Workers Training Course  
Fundamentals of Industrial Toxicology  
Understanding Lung Function Tests (sole instructor) one day  
Overview of Respirators & Respiratory Protection, sole instructor (8 hours)  
Spirometry for Physicians; sole instructor (8 hours)  
OSHA Hazard Communication, MSDS's and Labeling  
Certified Safety Professional Review Course.  
Topic: Toxicology  
Overview of Respiratory Protection: 7.5 Contact hours, sole instructor  
Respirator Fit Testing Workshop: 15 Contact hours, sole instructor  
OSHA Respiratory Protection Course #222 (three days).  
Respirator Selection and Change Out Schedule Workshop (8 contact hours)

## **Grants, Contracts and Projects:**

Society of Plastic Industries: "Investigation of Workers Exposed to Styrene and the Reinforced Plastics Industry". Erie, Pennsylvania. June 1978.

Teaching faculty at University of Cincinnati Pulmonary Function Workshops for NIOSH certification course. 1978-present. Course director 1983 - present.

NIOSH Health Hazard Evaluation (Project No. HE 78-39). "Isocyanate Exposure at an Automobile Manufacturing Plant". Vandalia, Ohio. June 1979.

Goodyear Tire and Rubber Company. Health Evaluation. "Rubber Dermatitis Study". Gadsden, Alabama. September 1979.

U.S.E.P.A. (Grant No. R-806669-01) "An Occupational Study of Women Exposed to Styrene and Reproductive Dysfunction". National Study 1979.

O.M. Scott Co. Health Hazard Evaluation. "Report of an Epidemiologic Study Performed at O.M. Scott Company on Workers Exposed to Vermiculite". Marysville, Ohio. June 1980.

NIOSH Health Hazard Evaluation Project (Title No. 210: 78 0105). "A Cross Sectional Morbidity and Industrial Hygiene Study of Portland Cement". National study, 1982.

NIOSH Contract # 84-132. Evaluation of NIOSH Approved Pulmonary Function Testing Courses. \$24,765.00. Principle Investigator, 1985-1986.

Contract: Chemlawn Corporation - Cross Sectional Health Study of Workers Exposed to Pesticides, 1987. Dr. R. Suskind, principle investigator.

Contract: Sheet Metal Workers Asbestos Surveillance Study: A six City Study. Drs. J. Lockey and D. Linz, principle investigators, 1987-1988.

Contract: Procter and Gamble Health Study. "Morbidity Study of Workers Exposed to Absorbent Gelling materials". 1400 workers. Principle investigator: Dr. D. Linz. \$147,714. 1988-4/30/90.

## Grants, Contracts and Projects, Continued:

- Grant: "Longitudinal Immunologic Surveillance of MDI Workers. Investigators: Bernstein I.L. & Bernstein D. Division of Immunology & Department of Environmental Health. 1992 - Present.
- Grant: New Methods for Quantitative Respirator Fit Testing. R01 OH 01301. September 1987-Present, \$370,000. Source: NIOSH. Dr. K. Willeke, principle investigator.
- Grant: "The Immunopathogenesis of Occupational Diseases Due to Reactive Chemicals". Institutional National Research Service Award. David I. Bernstein, principle investigator. July 1988-June 1990.
- Contract: Longitudinal Pulmonary Morbidity Study of Workers Exposed to Absorbent Gelling Material. Procter and Gamble Company. March 1, 1990-June 30, 1995. Susan Pinney, Ph.D., principle investigator, \$ 922,981.00.
- Contract: Thermal Insulation Manufacturers Association. "Pulmonary Surveillance Program for Refractory Ceramic Fiber (RCF) Manufacturing Facilities". Principle investigator: Drs. J. Lockey & G. Lemasters. 1/1/87 - 6/30/94, \$ 1,557,549.00.
- Contract: An Epidemiological Study Assessing Respiratory Effects of Former Workers Exposed to Ceramic Fibers. Investigators: GK Lemasters, JE Lockey, CH Rice, **RT McKay**, & PS Gartside. Source: Thermal Insulating Manufacturing Association. James Lockey & Grace Lemasters, principle investigators. 7/1/87 - 12/31/93, \$ 2,562,768.00.
- Contract: Respiratory Effects of Waste Incinerators. Investigators: BK Mortensen & S Wagner. Source: Ohio Department of Health, 1994, \$ 8,000.00.
- Contract: Respiratory Surveillance and Monitoring program for a Flavoring Company. Design and collection of pulmonary function data for a cohort of approximately 260 workers exposed to a variety of chemical agents. September 1994 to present.
- Grant: Sick Building Syndrome and Volatile Organic Compounds. Submitted Feb 15, 1997 to the U.S. EPA (National Center for Environmental Research and Quality Assurance). Principle Investigator: Douglas Linz, MD. \$279,005.00.
- Contract: Fit Testing and Use of Negative Pressure Respirators for Protecting Military Personnel Against Chemical warfare Agents. Principle Investigator: Roy T. McKay, Ph.D.. Project Awarded by the United States Navy on September 29, 1997, \$20,613.

## **Grants, Contracts and Projects, Continued:**

- Grant: Computerization of Statistical Methods for Longitudinal Pulmonary Surveillance. Original submission June 22, 1998, re-submitted June 2000 to the Department of Health & Human Services, Public Health Services. Roy McKay: Co-Investigator. Linda Levin: Principal Investigator. Funding period 3 years. Total = \$456,570.
- Grant: Respiratory Protection Against Bioaerosols in Agriculture. Department of Health & Human Services, Public Health Services. Roy McKay: Co-Investigator. Tina Reponen: Principal Investigator. Funding period 6/1/01 through 6/30/04. 10% year 2, 5% year 3. Total Cost = \$607,313.
- Contract: \$15,000. Evaluation of a shortened in mask sampling time for quantitative respirator fit testing. TSI Incorporated. June 2004.
- Grant: Multi-center Lymphangiomyomatosis Sirolimus trial. Department of Health & Human Services, Public Health Services. Roy McKay: Co-Investigator. Frank McCormack: Principal Investigator. Funding period 7/1/05 through 6/30/07. Total Cost = \$400,814
- Grant: Respiratory Protection Against Bioaerosols in Agriculture. National Institute for Occupational Safety and Health (NIOSH) Tiina Reponen, principle investigator. Dates of support: 8/1/2007 - 7/31/2010. Total cost = \$ 1,168,052.
- Grant submitted: Respirator Use and Protection Efficiency Among Poultry Workers Funding agency Ohio State University. Primary Sponsor: NIOSH. Dates of proposed support: 7/1/08 - 6/30/11, \$ 383,203.
- Grant submitted: Bioaerosol Exposures and Workers' Respiratory Health in Greenhouse Farms. CDC-NIOSH R01 Proposal: PA Number PAR-10-188. Atin Adhikari, Ph.D. (PI). August 2011 - July 2015.
- Contract: Fit Testing the Xcaper® Personal Smoke Mask with Bitrex and Banana Oil. Study sponsor: CDC/NIOSH. \$4,430.00. August 2010.
- Grant: Training course "Development of Respirator Cartridge Change Out Schedules". Funding source: Department of Energy. Sponsor: Los Alamos National Laboratory, NM. \$10,534. December 2016.

## Other Activities:

This listing is solely for the purpose of demonstrating the scope of various activities that Dr. McKay has participated in. Identification of company, client, or governmental agency is withheld to protect and maintain confidentiality. These activities are generally not reflected in research publications.

### 1994:

Investigation of a bronchiolitis obliterans, asthma, and other respiratory disorders at a food flavorings facility. Developed a pulmonary surveillance program for early identification of new cases.

Evaluation of an aerosol spray product sold as a consumers protect to protect leather goods. Principle complaints include the respiratory system.

Development of a new method to determine the ability of respirator users to conduct a user seal check.

### 1995:

Investigation of respiratory health effects to workers on a barge after an accidental release of chemical vapors. Mississippi.

Investigation of respiratory health effects to individuals exposed to a two-component concrete floor resurfacing material.

### 1996:

Investigation of Bitrex as a substitute respirator fit testing agent.

### 1997:

Determined the frequency of Pulmonary Function Tests needed for a global company to determine whether or not a significant change in lung function will occur between groups of workers exposed to a new chemical by inhalation. Also determined the frequency of testing needed to detect a significant change within an individual.

Comparison between interviewer and self administered questionnaire data.

**Respirator Fit Testing** and Use of Negative Pressure Respirators for Protecting Military Personnel Against **Chemical Warfare Agents**. Principle Investigator: Roy T. McKay, Ph.D.. Project Awarded by the United States Navy.

Development of a new method to determine an acceptable start of expiration during pulmonary function testing.

Field study regarding the ability of previously trained respirator users to conduct users seal checks.

Evaluation of Bitrex for fit testing full facepiece respirators.

**1998:**

Critical evaluation of a feasibility study of **respirator fit testing** equipment for shipboard use. Study conducted by the U.S. Navy.

Study of the predictive ability of Forced Expiratory Time analysis to identify COPD in smokers.

Testing the value of the OSHA exercise protocol when using controlled negative pressure fit testing.

**1999:**

Comparison study of respirator fit testing, user seal check procedures, and a pressure monitored user seal check device to detect exhalation valve damage.

Investigation of a workplace exposure, smoking, and lung cancer.

Development of a web based system for Respirator Medical Clearance.

**2000:**

Pulmonary evaluation to determine possible relationship between exposure to an irritant and changes in lung function at three different plant sites.

Investigative team member conducting a causal factors analysis of an apparent respirator use failure leading to an employee industrial exposure incident involving high dose Hydrogen sulfide at a refinery.

**2001:**

Provided respirator training and consultative services to a variety of governmental agencies with respect to respiratory protection against biological and chemical agents. Government agencies, included were not limited to Department of Energy (DOE), CDC/NIOSH, OSHA, etc.

Provided assistance, consultation and training to CDC/NIOSH/HETAB after the anthrax letters to improve preparedness for responses of this nature

**2002:**

Continuing to provide respirator training and consultative services to a variety of governmental agencies with respect to respiratory protection against biological and chemical agents. Government agencies, included were not limited to Department of Energy (DOE), CDC/NIOSH, OSHA, etc.

Provided pulmonary function studies for Iliximab Sarcoidosis study headed by Dr. R. Baughman.

- 2003:** Critical Evaluation of an Epidemiological Study Regarding the Pulmonary Health Effects of Soft Tissue Manufacturing in Europe.
- 2004:** Evaluation of a shortened in mask sampling time for quantitative respirator fit testing.  
  
Development and testing of an enclosure to protect personnel from Q-Fever contamination.
- 2005:** Pulmonary Function Quality Assurance for Rare Lung Diseases: a multi-center investigational trial for Lymphangioliomyomatosis and other rare lung diseases.  
  
Development of medical monitoring procedures and surveillance of laboratory animal handlers with potential for development of occupational asthma.
- 2006:** Studies evaluating the workplace protection factor (WPF) of respiratory protective equipment used in agriculture and during abatement of moldy buildings.  
  
Respirator Use and Protection Efficiency Among Agricultural Workers.
- 2008:** Investigating changes in respiratory protection with cyclic versus constant flow. Spirometry quality assurance review for a NIOSH Health Hazard Evaluation study on manicurists.  
  
Evaluation of the effect of facial hair on respirator fit and protection.
- 2009:** Fit test study to identify the fitting characteristics of a respirator in a general use population (non-occupational). Provided manufacturer assistance with study design, user instructions, etc.
- 2010:** Longitudinal investigation of worker's with long term exposure to vermiculite. Pulmonary surveillance of a community exposure to vermiculite.  
  
Technical reviewer for joint NIOSH/OSHA spirometry document, June 2010.  
  
Cincinnati CAPS study: Air pollution and pulmonary function in children.  
  
Fit Testing the Xcaper® Personal Smoke Mask with Bitrex and Banana Oil. Study sponsor: CDC/NIOSH
- 2011:** Assisted respirator manufacturer (Global Safety First) with submission and appeal for NIOSH certification of a strapless filtering facepiece respirator. Also assisted in the development & modification of user donning instructions.
- 2013:** Epidemiologic investigation of Lung Function among workers exposed to flavoring agents in California. Joint study with NIOSH.

- 2014:** Department of Defense. Defense Health Board. The role of spirometry for pulmonary surveillance of soldiers with potential exposure to airborne substances.
- 2015: External Advisory Board for project on the “Development and evaluation of a low-cost continuous respirator seal integrity monitor (ReSIM)”.
- 2016: Evaluation of ambient aerosol quantitative fit testing equipment based on the optical particle counting (OPC).
- 2017: Quality assurance evaluation of spirometry tests for workers with exposure to flavoring agents.
- 2018 Developed a comprehensive spirometry interpretation algorithm for use with spirometry testing software.
- 2019: Scientific Advisory Board. Midmark Corporation. Manufacturer of spirometry testing equipment.
- External academic reviewer for NIOSH fact sheet A Guide to Atmosphere-Supplying Respirators NPPTL-FSH-ASRespirators-RB-052419. June 2019.
- Evaluated a portable instrument for at-home measurement of Inspiratory Capacity (IC) and Slow Vital Capacity (SVC) as a potential tool to evaluate a patient's response to treatment, forecasting exacerbations, and predicting COPD mortality.
- Developer and technical advisor for development Respirator Qualitative Fit Testing software designed to automate, track, and record qualitative respirator fit testing using Saccharin and/or Bitrex aerosol solutions.
- 2020 Launched [QualFit](#) Software for respirator qualitative fit testing using Saccharin and/or Bitrex aerosol solutions.
- National Academies of Sciences, Engineering, & Medicine. Standing Committee on Medical and Epidemiological Aspects of Air Pollution on U.S. Government Employees and Their Families. Invited participant re: Expert testimony on respiratory protection for U.S. Department of State. April 1-2, 2020.
- Reviewer for CDC/NIOSH and OSHA: Preparing Solutions for Qualitative Fit Testing from Available Chemicals. Final: June 16, 2020.
- Technical advisor for Saint Louis University for development of 3D Printed SLU-CAM N95 Respirator Alternative.



Technical Advisor for D6 Inc. For development of N95 filtering facepiece respirator and reusable facepiece with disposable N95 filters.

ASTM F3407-20 Standard Test Method for Respirator Fit Capability (RFC) for Negative-Pressure Half-Facepiece Particulate Respirators. Published November 2020.

2021 Technical advisor for to a Michigan consulting firm providing quantitative leakage assessment testing for compliance with ASTM 3502-21 Standard Specification for Barrier Face Coverings.

Reviewer for NIOSH/NPPTL Fact Sheet: *“N95 Filtering Facepiece Respirators: Filtration Efficiency, Fit, and Total Inward Leakage”*. May 2021.

Reviewer for NIOSH/NPPTL Fact Sheet: *“How to tell if your N95 Respirator is NIOSH Approved”*. August 2021.

External Reviewer for NIOSH/NPPTL products such as research proposals and publications for respiratory protection. Point of Contact: Melanie Street, Morgantown, WV 304-285-5940 [mstreet@cdc.gov](mailto:mstreet@cdc.gov)

2023 Technical reviewer for the AIHA/ACGIH response to CDC’s proposed update to the “2007 CDC Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings”.