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Program Spotlight: Rush University Respiratory Care



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Rush University is the academic enterprise of Rush University Medical Center (RUMC) which is an Illinois non-profit 501(c)(3) corporation. It has as a tripartite mission: educational, research, and clinical practice. Each component of the mission of RUMC is co-equal in importance. This approach allows academics and research to be fully integrated with clinical practice, providing an educational experience built around a teacher-practitioner model to train the next generation of health care professionals and providers while promoting a research environment that goes hand in hand with clinical excellence.

Located on the RUMC campus in the heart of the Illinois Medical District, Rush University offers more than 40 degree and certificate programs. The

University includes Rush Medical College, the College of Nursing, the Graduate College, and the College of Health Sciences. Founded in 1972, Rush University educates more than 2,800 students both on-campus and online. The student body represents 18 countries, and there is an alumni network that includes more than 16,000 graduates worldwide.

The College of Health Sciences has grown its enrollment to more than 800 students in 16 different degree-granting programs. The college and its programs are committed to fostering excellence in teaching, research, service, and patient care. Outcome's research and collaborative and interdisciplinary research are priorities for the college. Further details can be found at www.rushu.rush.edu/health

Overview

The Department of Cardiopulmonary Sciences in the College of Health Sciences is dedicated to clinical and academic excellence in teaching, research, service, and patient care. The department contains a Cardiopulmonary Perfusion Program and a Respiratory Care Program. The department also combines clinical services in the hospital and a Master of Science degree program in respiratory care. The integration of hospital clinical services and the educational program aligns with Rush's vision to use a practitioner-teacher model to develop health care leaders who collaboratively translate and build knowledge to improve health care outcomes. The Respiratory Care Program provides students with an outstanding education in preparation for a satisfying professional career as respiratory care practitioner. The curriculum includes foundations for leadership in management/supervision, education, research, and clinical specialization. Students engage in seminars, intensive classes, laboratory and simulation exercises, clinical training, and research course work. The result is a framework for multiple career pathways in the field. The program strives to develop a sense of personal growth, professionalism, and a commitment to serving people. Patient care is integral to departmental teaching, research, and service activities.



A primary program objective is to educate professionally qualified, competent respiratory therapists who demonstrate leadership ability. Respiratory therapists need to cooperate with members of the health care team to identify and solve the problems related to respiratory diseases and disorders of the cardiopulmonary system. The respiratory therapist must critically think, communicate effectively, demonstrate judgment, and provide self-direction. The Respiratory Care program is dedicated to the mission, vision, and values of the College, University, and Medical Center.

Respiratory Care Program and Clinical Services Mission

Respiratory Care at Rush University and Rush University Medical Center is committed to providing high-quality, safe, family-centered, culturally sensitive, innovative care. We strive to achieve excellence in clinical service, education, and research by collaborating within and outside our community.

Rush University Mission

Rush University provides outstanding health sciences education and conducts impactful research in a culture of inclusion, focused on the promotion and preservation of the health and well-being of our diverse communities.

College of Health Sciences Mission

The mission of the College of Health Sciences is to advance the quality and availability of health care through excellence in education, research, scholarship, service, and patient care.

The Program

The Master of Science degree in Respiratory Care requires a minimum of 92 semester hours of credit for graduation. Before admission into the professional phase, the applicant must complete a baccalaureate degree and 29 hours of required prerequisites (human anatomy, human physiology, chemistry, physics, microbiology, psychology, computer science, and statistics). The 92 semester hours are divided over 6 semesters. The first year focuses primarily on didactic courses with hands-on laboratory exercises, competency-based simulation exercises, research methods, and introductory clinical rotation. Many of these courses incorporate a flipped classroom format to better prepare students for classroom activities. The program's second year focuses on their research and advancing the students' knowledge of education, management, cardiac disorders, advanced diagnostic testing, disease management, as well as adult, pediatric, and neonatal clinical practices. The students begin a series of research courses in the summer semester of their first year and complete a research project before graduation. The students complete over 1000 hours of in-hospital clinical practice before graduation, including a full-time five-week clinical specialization in an area of their choice.

The program has had 61 graduates between 2016-2020. Of these graduates, 60 of 61 (98%) have earned the CRT credential, and 58 of 61 (95%) have achieved the RRT credential. The retention rate during this period was 99%, and job placement was 95%. The majority of graduates have moved into leadership or education roles within 5-years after graduation. Of the 2011 through 2015

graduates (116), 52.5% and 18.9 % are in leadership and educational roles, respectively.

Research

The research in the department consists of qualitative and quantitative research, including randomized clinical trials. Research productivity has increased significantly in the last five years. We attribute this growth to an increase in doctoral prepared faculty and the evolution of our clinical practice at RUMC. During 2019, the faculty submitted 10 abstracts and 18 peer-reviewed publications. In 2020, the faculty had 9 abstracts and 25 peer-reviewed publications. In addition, our faculty had 3 of the top 25 read articles in RESPIRATORY CARE in 2021. Publications during 2020 and 2021 are listed below.

Publications for FY2020	Type
Li J, Fink JB, Ehrmann S. High-flow nasal cannula for COVID-19 patients: low risk of bio-aerosol dispersion. <i>Eur Respir J</i> 2020; 55(5):2000892.	Editorial
Dhand R, Li J. Coughs and Sneezes: Their Role in Transmission of Respiratory Viral Infections, Including SARS-CoV-2. <i>Am J Respir Crit Care Med</i> , 2020; 202(5):651-659.	Refereed article
Li J, Pavlov I, Laffey JG, Roca O, Mirza S, Perez Y, McNicholas B, Cosgrave D, Vines D, Tavernier E, Ehrmann S. Meta-trial of awake prone positioning with nasal high flow therapy: invitation to join a pandemic collaborative research effort. <i>J Crit Care</i> 2020; 60:140-142.	Editorial
Lyu S, Li J, Yang L, et al. The utilization of aerosol therapy in mechanical ventilation patients: a prospective multicenter observational cohort study and a review of the current evidence. <i>Ann Transl Med</i> 2020; 8(17):1071.	Refereed article
Fink JB, Ehrmann S, Li J, et al. Reducing aerosol-related risk of transmission in the era of COVID-19: An interim guidance endorsed by the International Society of Aerosols in Medicine. <i>J Aerosol Med Pulm Drug Deliv.</i> 2020; 33(6):300-304.	Editorial
Li J, Fink JB, MacLoughlin R, Dhand R. A narrative review on trans-nasal pulmonary aerosol delivery. <i>Crit Care</i> 2020; 24: 506.	Refereed article
Modi A, Kiorkas RD, Li J, Scott JB. The reliability of smartphone pulse oximetry in patients at risk for hypoxemia. <i>Respir Care</i> 2021; 66(3):384-390.	Refereed article
Li J, Fink JB, Ehrmann S. High-Flow Nasal Cannula for COVID-19 Patients: Risk of Bio-Aerosol Dispersion. <i>Eur Respir J</i> 2020; 56(4):2003136.	Editorial
Li J, Ehrmann S. High flow aerosol dispersing- versus aerosol generating procedures. <i>Am J Respir Crit Care Med</i> 2020; 202(8):1069-1071.	Editorial
Weiss T, Cerda F, Scott B, Kaur R, Sungurlu S, Mirza S, Alolaiwat AA, Kaur R, Augustynovich AE, Li J. Prone positioning for patients intubated for severe acute respiratory distress syndrome (ARDS) secondary to COVID-19: A Cohort Study. <i>Br J Anaesth</i> 2021; 126(1):48-55.	Refereed article
Scott JB, Schneider JM, Schneider KT, Li J. An evaluation of manual tidal volume and respiratory rate delivery during simulated resuscitation. <i>Am J of Emerg Med</i> 2020:S0735-6757(20)30896-2.	Refereed article

Tavernier E, Pavlov I, Laffey JG, Roca O, Mirza S, Perez Y, McNicholas B, Cosgrave D, Vines D, Ehrmann S, Li J. Awake prone positioning of hypoxemic COVID-19 patients: protocol for a randomized controlled open label superiority meta-trial. <i>BMJ Open</i> 2020;10(11):e041520.	Refereed article
Li J, Fink JB, Elshafei AA, Stewart LM, Barbian HJ, Mirza SH, Al-Harhi L, Vines D, Ehrmann S. Placing a mask on COVID-19 patients during high-flow nasal cannula therapy reduces aerosol particle dispersion. <i>ERJ Open Research</i> 2021;7(1):00519-2020	Refereed article
Li J, Jing G, Fink JB, Porszasz J, Moran E, Kiourkas R, McLaughlin R, Vines D, Dhand R. Airborne particulate concentrations during and after pulmonary function testing. <i>Chest</i> 2020;S0012-3692(20)35118-7.	Refereed article
Li J, Fink JB, Augustynovich AE, Mirza SH, Kallet R, Dhand R. Effects of inhaled epoprostenol and prone positioning in intubated COVID-19 patients with refractory hypoxemia. <i>Crit Care Expl</i> 2020; 2:e0307	Refereed article
Liu K, Jing G, Scott JB, Li J. Postoperative management of hypoxemia. <i>Respir Care</i> 2021 May 18:respcare.08929. doi: 10.4187/respcare.08929. Epub ahead of print. PMID: 34006596.	Refereed article
Duan J, Zeng J, Deng P, Ni Z, Lu R, Xia W, Jing G, Su X, Ehrmann S, Zhang W, Li J. High-flow nasal cannula for COVID-19 patients: a multi-center retrospective study in China. <i>Front Mol Biosci</i> , 2021 Apr 13;8:639100.	Refereed article
Li J, Perez A, Scheh J, Albers A, Hussin I. The association between upper airway patency and speaking valve trial tolerance for patients with tracheostomy: A clinical retrospective study and an in-vitro study. <i>Am J Speech Lang Pathol</i> 2021 May 31:1-9. doi: 10.1044/2021_AJSLP-20-00331. Epub ahead of print. PMID: 34057847.	Refereed article
Li J, Fink JB. Narrative review of practical aspects of aerosol delivery via high-flow nasal cannula. <i>Ann Transl Med</i> 2021;9(7):590	Refereed article
Li J, Ehrmann S. How to safely reopen cardiopulmonary rehabilitation facilities. <i>Chest</i> 2021 (in press)	Editorial
Li J, Tu M, Yang L, et al. Worldwide clinical practice of high-flow nasal cannula and concomitant aerosol therapy in critical care practice. <i>Respir Care</i> 2021 Apr 6:respcare.08996. doi: 10.4187/respcare.08996. Epub ahead of print. PMID: 33824172.	Refereed article
Lyu S, Li J, Wu MM, et al. The use of aerosolized medications in adult intensive care unit patients: A prospective, multicenter, observational, cohort study. <i>J Aerosol Med Pulm Drug Deliv</i> 2021; (in press)	Refereed article
Li J, Scott JB. Exploring evidence in the pandemic plays a crucial role in guiding clinical practice. <i>Respir Care</i> 2021;66(6):1039-1040.	Editorial
Kaur R, Weiss T, Li J et al. Practical strategies to reduce nosocomial transmission to healthcare professionals providing respiratory care to patients with COVID-19. <i>Crit Care</i> 2020;24, 571. https://doi.org/10.1186/s13054-020-03231-8	Refereed Article
Kaur R, Syed M, Erond I, Stringer B, Chen E. Compassionate extubation in adult ICUs: A quality improvement project. <i>Chest</i> 2020;158 (4): A1299. https://doi.org/10.1016/j.chest.2020.08.1184	Abstract
Kaur R, Vines DL, Patel AD, Robles-Lugo R, Balk, RA. Early identification of extubation failure using integrated pulmonary index and high-risk factors. <i>Resp Care</i> 2021 (Ahead of Print). https://doi.org/10.4187/respcare.08656	Refereed Article
Kaur R. Role of Respiratory therapists in quality improvement. An Official Publication of the American Association of Respiratory Care, July 2020	Op-Ed

Kaur R. Prone positioning during COVID-19 pandemic- A Collaborative effort at Rush University Medical Center. The ISRC Tract- an official publication of the Illinois Society of Respiratory Care 2020, Vol 39 (112)	Op-Ed
Scott JB, Kaur R. Monitoring Breathing Frequency, Pattern, and Effort. <i>Resp Care</i> 2020; 65 (6) 793-806; DOI: 10.4187/respcare.07439. https://doi.org/10.4187/respcare.07439	Refereed Article
Scott JB, Walsh BK, Mirza SH, Shelledy DC. Blood Gas Analysis, Hemoximetry and Acid-Base Balance in Shelledy DC, Peters JI (Eds). <i>Respiratory Care: Patient Assessment and Care Plan Development</i> . Burlington, MA Jones and Bartlett Learning. 2020.	Book Chapter
Scott JB. The Conundrum of mechanical ventilation alarms. <i>Respir Care</i> 2021;66(4) 699-700.	Editorial
Robert KJ, Tanner D, Lamb KD, Light A, Kriner EJ, Fratzke ML, Hylton JC, Ruppert T, Inkrott JC, Hinkson CR, Scott JB. Mechanical ventilation education developed for non-ICU clinicians. <i>Respir Care</i> 2020;65 (Suppl 10) 3442081.	Abstract
Alshuwaikhat H, Scott B, LaGorio L. The impact of high-flow nasal cannula on swallow function. <i>Respir Care</i> 2020;65(Suppl 10)3440132 .	Abstract
Li J, Scott JB. Exploring and creating new evidence in a pandemic plays a crucial role in guiding clinical practice. <i>Respir Care</i> 2021;66(6):1039-1040.	Editorial
Alshuwaikhat H, Scott B, LaGorio L. The Impact of High-Flow Nasal Cannula on Swallow Function. <i>Respir Care</i> . 2020;65(Suppl 10)3440132	Abstract
Elpern, EH, Nedved, P, Weiss, TT, Patel, AD, Cerda, F. (2021) Implementing a multidisciplinary prone positioning team. <i>AJN</i> 121(6):48-53.	Refereed Article
Belice PJ, Mosnaim G, Galant S, Kim Y, Shin H, Pires-Barracosa N, Hall J, Malik R, Becker E. The impact of caregiver health literacy on healthcare outcomes for low income minority children with asthma. <i>J Asthma</i> 2020;57(12):1316-1322.	Refereed Article
Kaur R, Klein E, Moran E, Foley S, Becker EA [abstract]. Determining minimal number of attempts to achieve repeatability of sniff nasal inspiratory pressure measures. Accepted for presentation at the American Association for Respiratory Care International Congress, Respir Care, October 2020.	Refereed Article
Wakefield CJ, Hejna E, Jochum S, Peterson S, Vines D, Hayden DM, Balk RA. Prolonged invasive mechanical ventilation is associated with reduction in respiratory muscle cross-sectional Area. <i>Chest</i> 2020;158(4):A579 https://doi.org/10.1016/j.chest.2020.08.547	Abstract
Wakefield C, Hejan E, Jochum S, Peterson S, Vines D, Shah P, Balk R, Hayden DM. Novel application of respiratory muscle index obtained from chest CT to predict postoperative respiratory failure after major non-cardiothoracic operation. <i>Trauma</i> 2020;231(4): S325: https://doi.org/10.1016/j.jamcollsurg.2020.07.670	Abstract
Vines DL. Unanticipated respiratory compromise on the hospital wards: It's a major problem! <i>Respir Care</i> 2020;65(9):1414-1415. doi:10.4187/respcare.08397, 10.4187/respcare.08397.	Editorial
Tan AM, Vines DL, Krishnan JA, Prieto-Centurion V, Kallstrom TJ. Home oxygen evaluation by respiratory therapists in patients hospitalized for COPD exacerbations: the RIsOTTO study. <i>Respir Care</i> 2020, doi:10.4187/respcare.07628, 10.4187/respcare.07628	Refereed Article
Vines DL and Gardner DD. Airway clearance therapy In: Kacmarek RM, Stoller JK, Heuer AJ. <i>Egan's Fundamentals of Respiratory Care</i> (12th ed.). Maryland Heights, MO, Mosby; 2021.	Book Chapter

Vines DL, Storage and Delivery of Medical Gases In: Kacmarek RM, Stoller JK, Heuer AJ. Egan's Fundamentals of Respiratory Care (12th ed.). Mosby; 2021.	Book Chapter
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In June 2020, we received a \$650,000 foundational grant to conduct COVID-19 clinical trials. With this funding, we were able to participate in a multinational meta-trial that was published this fall in *The Lancet Respiratory Medicine*. (Ehrmann, S., Li, J., Ibarra-Estrada, M., Perez, Y., Pavlov, I., McNicholas, B., Roca, O., Mirza, S., Vines, D., Garcia-Salcido, R., Aguirre-Avalos, G., Trump, M. W., Nay, M. A., Dellamonica, J., Nseir, S., Mogri, I., Cosgrave, D., Jayaraman, D., Masclans, J. R., Laffey, J. G., Tavernier, E., Awake Prone Positioning Meta-trial Group. Awake prone positioning for covid-19 acute hypoxaemic respiratory failure: a randomized, controlled, multinational, open-label meta-trial. *The Lancet Respiratory Medicine*. 2021; 9, 1387-1395.)

Faculty

The Department of Cardiopulmonary Sciences has 10 faculty members and a medical director. The faculty members split their time between teaching courses, research and service activities, and patient care at Rush University Medical Center. All faculty members are actively involved in professional organizations such as the AARC, ISRC (Illinois Society for Respiratory Care) and serve on various national boards and committees.



David Vines, PhD, RRT, FAARC, FCCP, is currently a professor, respiratory care program director, and founding chairperson for the Department of Cardiopulmonary Sciences in the College of Health Sciences at Rush University. In 1991, David completed a Bachelor of Science (BS) degree in biology from Centenary College and a BS degree in cardiopulmonary science from Louisiana State University Medical Center (LSUMC) in Shreveport, La. He completed a Master of Health Science (MHS) degree in clinical physiology from LSUMC while working at the medical center. David earned his PhD in Health Sciences from Rush University in 2019. He accepted a faculty position at University of Texas Health Science Center (UTHSCSA) in San Antonio, Texas in 1999. While at UTHSCSA, David advanced in leadership roles and served as Program Director and Interim Chairperson for the Department of Respiratory Care. In July 2009, David moved to Rush to start the entry master's level respiratory therapy program. He also serves a role in hospital operations providing oversight to Rush's respiratory care services. David has been a respiratory therapist for over 30 years, written multiple textbook chapters, peer-reviewed articles and abstracts, clinical review articles, and presented at national and international congresses numerous times. He is currently the president of the

National Board for Respiratory Care and one of the editors for the 13th edition of *Egan's Fundamentals of Respiratory Care*. His professional service earned him the honor of being recognized as a Fellow of the AARC and Chest. David's research interests include critical care, mechanical ventilation, disease management, and patient outcomes related to the practice of respiratory care.



Steven Mosakowski MBA, RRT, RRT-ACCS, RRT-NPS, CPFT, FAARC is the director of respiratory care services and assistant professor in the Department of Cardiopulmonary Sciences, College of Health Sciences at Rush University. Steve has more than 35 years of experience in respiratory care and over 23 years in coast-to-coast leadership roles. He has lectured at national meetings and has served on several advisory boards as a member of various educational programs and industry. Steve has also served as an AARC Sputum Bowl Committee Member, moderator, and judge. Currently, Steve is the President of the ISRC. He has also served as past ISRC Chapter 2 Chair and Past-President and board member of the Pennsylvania Society for Respiratory Care for many years.



J. Brady Scott, PhD, RRT, RRT-ACCS, AE-C, FAARC, FCCP, is the director of clinical education for the respiratory care program and associate professor in the Department of Cardiopulmonary Sciences in the College of Health Sciences at Rush University. He earned his first respiratory therapy degree from Bluegrass Community and Technical College (Kentucky), his Bachelor of Science degree in Respiratory Therapy from the University of North Carolina at Charlotte, and his Master of Science in Respiratory Care from Rush University. Brady earned his PhD in Health Sciences from Rush University in 2021. Before joining the Rush team, he was a Clinical Supervisor at Duke University Medical Center in Durham, North Carolina. He has been a respiratory therapist for more than 20 years, with clinical practice experience in adult emergency/critical respiratory care. In 2007, he was named the Adult Acute Care Specialty Practitioner of the Year by the American Association for Respiratory Care (AARC). In 2021, he received the Charles H. Hudson Award for Cardiopulmonary Public Health. He is a fellow of both the AARC and the American College of Chest Physicians. Brady has lectured at several regional, state, national and international conferences on topics pertaining to respiratory care. Additionally, he has written several textbook chapters, original research articles, research abstracts, and review articles. His research interests include simulation-based education and emergency/critical respiratory care.



Ellen Becker, PhD, RRT-NPS, RPFT, FAARC, is a Professor in the Department of Cardiopulmonary Sciences and has been a respiratory therapist for over 40 years and a certified asthma educator for the past 20 years. Her doctorate is in adult education from the University of Wisconsin-Madison. She began the first third of her career at the University of Wisconsin

Hospital & Clinics in Madison, WI, where she practiced respiratory care across a wide variety of clinical settings. The second third of her career was spent at Long Island University in Brooklyn, New York, teaching undergraduate respiratory care courses. Ellen founded and directed the Brenda Pillors Asthma Education Program that served the New York City region for four years before moving to Rush University Medical Center a decade ago. At Rush, Ellen has taught a variety of courses and spends time working in the Pulmonary Function Lab and mentoring student research projects. Her current research interests center around quality control for pulmonary function, the impact of proper inhaler use and clinical outcomes, and reevaluating how race and ethnicity are used in lung function assessments.



Jie Li, PhD, RRT, RRT-ACCS, RRT-NPS, FAARC, is an associate professor in the Department of Cardiopulmonary Sciences in the College of Health Sciences at Rush University. She is also the section editor for the *Respiratory Care Journal*, the official academic journal of the AARC. During the COVID-19 pandemic, she was invited to join the WHO's respiratory care expert panel. She earned her bachelor's degree in respiratory care and master's degree in internal medicine in China. After spending ten years in Beijing as a respiratory therapist, she joined Rush in 2014. She completed her PhD in Health Sciences from Rush University in 2019. Her research interests are aerosol therapy, prone positioning, and respiratory support, including high-flow nasal cannula oxygen therapy. In these areas, Jie has 60 peer-review publications (52 as first or corresponding author) in several different journals, including *Lancet Respiratory Medicine*, *American Journal of Respiratory and Critical Care Medicine*, *European Respiratory Journal*, *Critical Care*, *Chest*, *British Journal of Anesthesia*, *Respiratory Care*, and others. She also co-authored 2 books and has presented more than 70 invited lectures at national and international conferences. Due to her research achievements, Jie received the Young Investigator Award from the International Society for Aerosols in Medicine in 2021. She also received the Teaching Excellence Award from the program's respiratory care students in 2020.



Ramandeep Kaur, PhD, RRT-ACCS, AE-C, is currently an assistant professor in the Department of Cardiopulmonary Sciences and has been a respiratory therapist for 10 years. She earned her BS degree from Manipal University, India, and her Master of Science in Respiratory Care from Rush University. While practicing at RUMC, Ramandeep earned her PhD in Health Sciences from Rush University in 2021. Her doctoral research was focused on the early identification and prevention of extubation failure among adult patients. Her other active research areas include patient-oriented research to improve end-of-life care during ventilator withdrawal and studying the impact of compassionate extubation on clinicians. In 2020, Ramandeep received the AARC Vision grant to study the impact of respiratory therapist staffing on clinical outcomes of patients with COVID-19 receiving mechanical ventilation. Ramandeep has first-authored four manuscripts and co-authored five other manuscripts. In addition, she presented her research work at several state and national conferences.



Tyler Weiss, MSc, RRT, RRT-ACCS, AE-C, FCCP, is currently the adult clinical education coordinator and assistant professor in the Department of Cardiopulmonary Sciences in the College of Health Sciences at Rush University. He earned his Bachelor of Science in Health Professions from Grand Valley State University and his Master of Science in Respiratory Care from Rush University. Tyler is highly involved as an educator for the American College of Chest Physicians (CHEST) and sits on the airway management and mechanical ventilation domain task forces. Through CHEST, he has been recognized as a Distinguished CHEST Educator on multiple occasions and earned the acknowledgment as a Fellow of the College of Chest Physicians in 2020. Tyler has published research on various topics related to adult critical care and clinical simulation education and has presented numerous times at regional, national, and international conferences. Tyler is also a PhD candidate in Health Sciences at Rush University with his research focus on prone positioning in patients with acute respiratory distress syndrome. His research interests include adult critical care medicine and clinical education.



Sara Murphy, MBA, RRT, RRT-NPS, RRT-ACCS, AE-C, is an instructor in the Department of Cardiopulmonary Sciences in the College of Health Sciences at Rush University. She has been a respiratory therapist for more than 14 years and currently serves as a Clinical Educator in the neonatal/pediatric section of the respiratory care services. Sara is a member of ISRC planning committee and ISRC Chapter 2 planning and nominations committees. Sara has

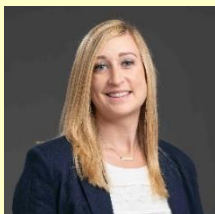
contributed to peer-reviewed publications and has presented at several conferences.



Mark Yoder, MD, MS, is the medical director of the respiratory care program. He completed a fellowship in pulmonary and critical care medicine at the Johns Hopkins Hospital. He then joined the faculty at Rush University Medical Center and is currently an Associate Professor of Medicine in the Division of Pulmonary, Critical Care & Sleep Medicine. He is honored to contribute to the education and advancement of respiratory care as medical director of the respiratory care program and pulmonary function lab. He is also a co-director of the Pulmonary and Cardiac Disease courses in the curriculum. In addition, Mark serves as a member of the Board of Medical Advisors to the American Association for Respiratory Care.



Ankeet Patel, MSc, RRT, RRT-ACCS, is the adult care section manager of respiratory care services and an assistant professor in the Department of Cardiopulmonary Sciences in the College of Health Sciences at Rush University. He has more than 10 years of experience in respiratory care services as a clinical specialist and manager. He is currently enrolled in a Master of Business Administration program specializing in data analytics. He also received the Larry Goodman leadership award from RUMC in 2021. In addition, he has contributed to peer-reviewed publications and presented at conferences.



Anne Geistkemper, MSc, RRT, RRT-NPS, is the neonatal-pediatric section manager of respiratory care services and an instructor in the Department of Cardiopulmonary Sciences in the College of Health Sciences at Rush University. She graduated with a Master of Science in Respiratory Care from Rush University in 2012. Anne is involved professionally as an AARC Education Section Preceptor, AARC exam prep faculty member, ISRC Chapter 2 Chair, and ISRC Program Committee member. She was most recently awarded the 2021 AARC Neonatal-Pediatric Specialty Practitioner of the Year Award. She has also contributed to peer-reviewed publications and presented at conferences.

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Medical Professionals' Role in Supporting Vaccination for Coronavirus Disease 2019 (COVID-19)

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In the fall of 2020, the CoBGRTE *Coalition Chronicle* published an article on vaccination compliance prior to the availability of vaccination for the coronavirus disease COVID-19 pandemic.¹ At that time there were no preventative or therapeutic measures other than public health mitigation tactics like those used in the 1918 Influenza epidemic: wearing facemasks and isolation. The article noted evidence that comedic satire might provide a positive psychological tactic to boost forthcoming vaccine acceptance. Humor and irony have been used to confront other unpleasant realities of life and could be applied to the pandemic. The author presented evidence by which satire might be applied to increase vaccination among those with denial of COVID-19's severity, vaccine hesitancy, outright resistance, and counter acceptance of shame therapeutics.¹

Over the past year, monumental scientific, manufacturing, and distribution efforts have resulted in multiple vaccines becoming available to deal with the current pandemic. According to data compiled from government sources by Oxford University's *Our World in Data* project, the worldwide population receiving at least one vaccine dose is estimated to be approximately 60.8%.² In the United States, there has been vaccine response ranging from jubilant acceptance, some skepticism to extreme resistance and deliberate promoting of misinformation. Despite a US death toll of over 837,000, in some states the percentage of the 18–64-year-old population who are (fully) vaccinated is as low as 50%.³ Efforts to develop and distribute a safe and effective vaccine are wasted if vaccines are not taken. This article will review reasons that interfere with vaccination strategies, as well as communication tactics, which may be effective in increasing vaccination. Respiratory therapy departments, schools and individual clinicians may be in unique situations to positively influence patients' understanding and acceptance of vaccination in general and specifically for COVID-19.

Background

Vaccines

A monumental commitment by scientists and the global pharmaceutical industry was initiated to develop vaccines to deal with COVID-19. In early 2020 the genetic sequence of SARS-CoV-2 was shared through the Global

Initiative on Sharing Avian Influenza Data (GSAID). To date at least nine different vaccine types have been developed and are credited for significant reduction in death and disease severity.⁴ These include: mRNA (Pfizer-BioNTech and Moderna), adenovirus viral vector (Oxford-AstraZeneca, Sputnik V), inactivated virus (CoronaVac, Covaxin) as well as protein subunit vaccines. Most of the vaccines have been found to be highly protective against severe illness, hospitalization, and death; effectiveness ranges from 66%-91% depending on the type of vaccine and COVID-19 variant. Worldwide distribution of the COVID-19 vaccines has been a monumental task and access has been unequal; high-income nations which represent approximately 14% of the global population have obtained over 50% of the doses.

The medical evidence for early infant and periodic vaccinations of children and adults has been demonstrated to be one of the most effective public health measures to prevent disease as well as reduce mortality and morbidity in epidemics and pandemics.⁵ Decline in morbidity of diseases with effective childhood immunization exceeds 92% for communicable diseases such as measles mumps, rubella (MMR), diphtheria, polio, smallpox, tetanus and pertussis.⁶

The author has a clear remembrance of receiving his Salk polio vaccination during a 1st grade school day in 1954. Although not that keen about needles, my classmates and I were elated that we might be spared braces, crutches, and an iron lung.



In 1954, 1.8 million children participated in the Salk polio vaccine trials. (Photo: March of Dimes)

For adults, the CDC's Advisory Committee for Immunization Practices (ACIP) recommends that adults (18-and older than 65 years) receive immunization against: influenza, tetanus-diphtheria, tetanus-diphtheria-pertussis, varicella, human papillomavirus (HPV), herpes zoster, measles-mumps-rubella, and *Streptococcus pneumoniae*.

Besides just the effect benefiting individuals, when a large percentage of a population is immunized, even unvaccinated individuals benefit from *herd immunity*. The common implication of the mathematical-based theory is that the risk of infection among susceptible (unvaccinated) individuals is reduced by the presence and proximity of immunized individuals; this is sometimes referred to as "indirect protections" or a "herd effect). Calculated threshold percentage of a population to be immunized varies based on the disease's contagious nature and setting. The extremely contagious childhood diseases such as measles, mumps, and rubella (MMR vaccine) need to have 93-95% of a community's children immunized to the confer herd effect.^{7,8}

Countries with robust public health systems which both promote vaccination through education and easy access have a better result in overall health. This has resulted in a significant decrease in communicable diseases. It has been estimated that because of childhood immunizations in the US, approximately 20 million illnesses and 40,000 deaths are prevented each year. This also results in a savings of about \$70 billion.

Hence the national government and employers have been eager to require vaccinations. There is evidence that this "heavy-handed" approach works. There is a long history of successful vaccination for smallpox in the US starting with General George Washington requiring vaccination of his troops in the Revolutionary War. The positive effect on limiting school admission of children has been documented with support from the Academy of Pediatrics.⁹ A decline in vaccination due to increase use of exemptions prompted the State of California to eliminate religious and personal exemptions 2015. Although there was an increase in use and abuse of the still existing medical exemption, the new law resulted in a rapid increase in vaccination coverage.¹⁰ Religious exemptions have been allowed in many states and have a history of being abused. Most religious doctrines call for preservation of life, caring for others, duty to community, and protection of children and neighbors. There continues to be significant numbers of Amish and Evangelical Christian church members who remain unvaccinated, largely in response to urging of their church leaders.

Vaccine Hesitancy and Anti-vaccination

The World Health Organization (WHO) and national agencies such as the Centers for Disease Control (CDC) in the US have been devoted to supporting vaccination. In 2019, WHO deemed that delay in acceptance or refusal of vaccination (despite access) as the top 10th threat to global health. Unfortunately, there are also devoted anti-vaccination activists, politicians and conspiracy theorists and scam artists. Distorted and false vaccine information abounds. There has been misrepresentation of immune system science, lies about manufacturing sources and exaggeration of side effects. The internet and social media have accelerated dissemination of this anti-vaccination messaging. Even prominent politicians promote sham therapeutics with substantiated lack of effect and potential harm. This collection of factors associated with increased hesitancy for the COVID-19 vaccine generally parallels factors for other vaccines but now is exacerbated in a public suffering from pandemic fatigue.

“Telling a lie often enough, it becomes the truth.”

Attributed to Vladimir Lenin and Isa Blagden’s *The Crown of Life* 1869

Political factors have come to play during this pandemic. The unprecedented speed which allowed research and vaccine development has become a negative attribute to public confidence.¹¹ Initially there were political-based misperceptions about the severity of the COVID-19 and preference for natural immunity. Surveys have noted greater hesitancy and refusal based on several factors including lower education level, the unemployed, younger populations, certain ethnic groups, and US political party. There is a growing mistrust of government especially related to political motives, concerns about pharmaceutical corporate profit, and especially mandatory vaccination.^{12,13} The Anti-vaccination Society of America was started in 1879 to fight against mandatory smallpox vaccinations. There is a culture in the US of unrelenting personal independence, represented by New Hampshire’s state motto, *live free or die*. However, in 1905 (Jacobson vs. Massachusetts) the US Supreme Court gave state governments the authority to require their citizens to become immunized (for smallpox). The court stated, “there are limits to individual rights to support public health necessary through reasonable legislation.”

Over time, governmental agencies and private organizations have used both positive (carrot) and punitive (stick) approaches to bolster vaccination of citizens. There has been dissemination of public service information based on logic, reduced or free immunization, increased access/distribution, appeal to personal/community responsibility, lotteries, or direct financial reward. Failure to vaccinate has resulted in corporations and local governments limiting access to

recreational events, entertainment, dining facilities or air travel, increased health insurance premiums, and mandates including termination of employment.

“A lie can get halfway around the world before the truth has put its pants on.”

Attributed to Mark Twain (Samuel Clemens), Winston Churchill, C.H. Spurgeon and Jonathan Swift

Governmental mandates are largely motivated to achieve “herd immunity.” This approach has been effective in (nearly) eliminating disease like childhood measles, polio, mumps, and rubella. Vaccine resistance, inability to vaccinate young children and breakthrough infections makes achieving herd immunity for COVID-19 less likely; the world population may expect to see ongoing transmission for some time. A modified goal would be to get to a level of population immunity where severe COVID-19 effects can be manageable and decrease morbidity, hospitalization and death reduced. Currently the risk of serious disease in the unvaccinated population is higher than it has ever been.^{14,15}

Strategies for Improving Patient Vaccination for COVID-19

Experience based on previous vaccines suggests adoption of multilevel and evidence-based approaches using information from social, behavioral, communication and implementation sciences. This evidence can inform public health systems, medical organizations, clinical services, as well as individuals’ interpersonal efforts.^{16,17,18}

Policy organization & community-level interventions^{18,19,20,21}

- Reduction in out-of-pocket expense for patients
- Requiring vaccination for childcare centers, schools and colleges and offering easy access vaccination in such facilities
- Supporting medical clinicians by implementing standing orders for nurse visits to audit patient vaccinations.
- feedback, reminder/recall systems, point-of-care prompts, and home visits.
- Develop and provide education materials
- Interpersonal-level interventions^{22,23,24,25,26,27}
 - Training of clinicians to effectively interact with patients and/or patients’ parents (pediatric populations).

- Promote communication with honest demeanor, consistency and culturally appropriate.
- Empower both health care staff and clinicians
- The quality and strength of language and phrasing of conversations results in higher vaccine acceptance.
- Use presumptive announcement-style language to make recommendations
 - “Your doctor recommends that you receive the COVID-19 vaccine.”
 - “After your visit, a RN will give you your COVID-19 vaccination.”
 - “The COVID-19 vaccination we use at the clinic is safe and effective?”
- Positive-framing (gain-framing) of messages.
 - “By getting your vaccination you will protect yourself and your loved ones.”
- Motivate based on anticipated regret ---not to have gotten vaccinated.
- Correct misperceptions about vaccines with care; direct efforts may have negative effect. Frame alternative messaging to affirm patients’ personal values or altruistic view; provide factual alternative responses.
- Repeat information with emphasis on efficacy of vaccination.
- Be understanding of patient’s confusion based on changing recommendations, multiple vaccines, dosing schedules, and other logistics.

Despite the development of effective vaccines, adequate distribution, access, and general acceptance by a large portion of the population, growing vaccine hesitance or refusal continues to dilute overall effectiveness. New cases and the death toll increase. Background issues for COVID-19 vaccine hesitance are complex yet necessary for healthcare personnel to understand. In high income countries, permanent refusal of all vaccines is uncommon, and surveys note eventual acceptance. The experience of hospital admission for COVID-19 may provide an opportunity for counseling and vaccine acceptance much like smoking cessation.²⁸ Therapists at the bedside, in other clinical settings and home visits have an opportunity to participate with forthright and effective communication to positively leverage patients to receive COVID-19 vaccinations.

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Discovering Future Respiratory Therapy Students through the Core Curriculum

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Dr. Case

In a matter of two years, we have seen complete upheaval within the United States' health care system as well as health systems around the world. A pandemic set the stage to challenge wellness on a global scale. This pandemic, SARS-CoV-2, found its way to American shores in January 2020. American health care experienced a test never before seen by this nation. Hospitals were underprepared and quickly overrun with unprecedented illness. Personal protective equipment was in short supply and staffing unfortunately even shorter. Respiratory Therapy was not immune to the staffing crisis. The Respiratory Therapy workforce struggled under the demands of an overwhelmed system. Respiratory therapists left the bedside rather than chance infection as a result of insufficient knowledge and lack of personal protective equipment. Shortages of qualified staff spread around the country. The federal government stepped in to provide FEMA assistance. Inundated hospitals looked to respiratory therapy educators across the nation to ease their staffing crisis only to find open seats in classrooms across the nation.

Enrollment in Crisis

The Commission on Accreditation for Respiratory Care (CoARC) reported as part of their 2020 Report on Accreditation in Respiratory Care Education declining application numbers to associate's, bachelor's and master's degree entry-level respiratory care programs. Between 2010 and 2016, respiratory care education programs reported a decline of 41% in applications received. Smaller declines noted in subsequent years. A decline in applications translates to a substantial

decrease in program enrollments just as the demand for respiratory therapists skyrocketed.

Respiratory care educators agree that the struggle to fill seats is not a new issue. Historically, numbers have been on a downward trend for nearly a decade. CoARC reported that compared to 2018, 2019 saw new enrollments decrease by 0.7% for community/junior colleges; by 9.8% for four-year colleges/university programs; by 6.4% for health science center/medical centers; by 13.9% for U.S. military programs and by 26.2% for career/technical colleges.¹ Most importantly to note, programs across the nation are simply not at maximum enrollment capacities.¹ The explanation for this trend is unclear. Experts point to decreasing overall college enrollments as a whole. Nationwide trends indicate that the college-age population in the United States will drop between 13% and 29% depending on the state/region within the next ten years.² Simply stated, supply and demand is no longer in our favor.

With enrollments declining across college campuses, the challenge for respiratory care education is clear. Students will not simply find us. We must find them! Student recruitment strategies are an increasingly vital component to the survival of our profession. Limited budgets and time present as substantial obstacles for the majority of educational programs across the nation. Despite these limitations, numerous opportunities are still available for the optimistic and outgoing recruiter.

Core Curriculum

Respiratory care education programs must work harder as well as smarter to recruit students in today's academic environment. It is essential to connect with potential students where they are. For years, a recruiting booth in the student center resulted in numerous student contacts. This is simply no longer the case. The lasting effects of the pandemic are clearly apparent in student foot traffic across halls on campus. Online core classes are now the norm to include even science prerequisites. For those students who are on campus, personal digital devices demand their attention. The chance for a casual conversation is becoming increasingly limited. Again, this reinforces the idea that as respiratory care educators, we must take advantages of opportunities to engage with students where they are. The solution is in the classroom!

Too often as respiratory care faculty, we limit ourselves to respiratory care courses. I challenge each of you to think outside the respiratory box. Are you only qualified to teach in respiratory care? Are there potential opportunities for respiratory care faculty to teach within the core? Often, the answer is yes! In some cases, respiratory care faculty have the skills to teach several different core courses within the curriculum. For example, as the common core evolved here in

the State of Texas a new core content area developed as general humanities phased out of the required course work. Opportunities to study other cultures around the globe as well as health in those countries emerged. With my Doctorate in Health Science with a Concentration in Global Health, I was a perfect fit to teach a Global Health and Wellness course taught here on-campus and on-line. This course satisfied a core requirement for all potential health science students here at Midwestern State University. In addition to Global Health and Wellness, respiratory care faculty teach other core classes across campus to include but not limited to Data Analysis (a required course for not only respiratory care majors, but also nursing, radiology, social work and dental hygiene) as well as Understanding Community and Public Health (a course satisfying the Inquiry and Creativity core component). Simply, respiratory care faculty teaching within the core equates to better student awareness of the profession.

Recruiting Within the Core

Faculty workload and even overload may potentially reduce a program's ability to teach outside of the required respiratory courses. While clearly a limitation, opportunities remain. Reaching students that have an interest in the health sciences as a profession is essential to filling respiratory care seats. Incoming freshmen students may have no awareness of other health science disciplines outside of physicians and nurses. Most students considering health related career paths would declare pre-medicine or nursing as majors upon admission to higher education. Fortunately, those majors have common prerequisites with most allied health programs. Recruiting from these science course requirements often has great impact on interest in respiratory care and ultimately increases applications. Faculty across campus are often more than willing to share five to ten minutes of class time to allow program faculty to introduce the future healthcare providers to allied health occupations. Often our anatomy & physiology as well as microbiology faculty coordinate recruiting visits with respiratory associated curriculum within the course further cementing the relevance of our professional field. Recruiting efforts for respiratory care are by no means limited to a program's home campus. Professional networking often allows additional opportunity to recruit within science courses offered at local community colleges and even high school campuses.

Respiratory therapy educational programs across the United States face a tremendous task ahead of them. To develop a strong work force of effective respiratory therapists, we will have to think outside of the box. A defined initiative to seek out those students wishing to pursue "helping" professions must be in the future. Recruitment efforts will have to broaden and the methods we use will have to modify as the academic world continues to evolve. As a profession that has met numerous challenges in the past, respiratory therapy will find ways

to overcome this challenge as well. It will take dedication, steadfastness, and flexibility. Who better to find triumph when faced with adversity than the resilient profession of Respiratory Therapy!

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Doctoral Program Designed for Respiratory Therapists to Begin Fall 2022

Douglas S. Gardenhire, EdD, RRT, RRT-NPS, FAARC

Rachel Culbreth, PhD, MPH, RRT

Introduction

Georgia State University has created and been approved to administer a PhD in Health Science with a concentration in Cardiopulmonary Science. This is the first doctoral program specifically aimed at respiratory therapists in the United States.

The need for respiratory therapy (RT) educators with advanced degrees is not a new concern for the profession. Educators looking for advanced degrees have relied on a Master of Science, preferably a Master of Science that provides 18 hours in the discipline of respiratory care to satisfy regional accreditors. However, when looking for a doctoral program many were left choosing the education route or a program that was generic but could incorporate the background of the respiratory therapist. Beginning this August, a program designed to create an educator and researcher in the discipline of respiratory therapy is now available at a public university.

Georgia State University

Georgia State University (GSU) is public R-1 Research University with six campuses throughout metro Atlanta, serving over 52,000 students. The main campus, located in the heart of downtown Atlanta is among the most diverse universities in the nation. The university is a national leader with its commitment to undergraduate teaching and graduating students from diverse backgrounds. This commitment to diversity has resonated with GSU conferring more undergraduate and graduate degrees than any other public or nonprofit university to African Americans, Asian and Latinx students.

The commitment to research is just as important as student success at GSU. In the last seven years GSU has exceeded \$100 million in external research awards. This commitment to research has shaped the Department of Respiratory Therapy and their commitment to developing a top-notch researcher and educator.

Doctor of Philosophy with a Concentration in Cardiopulmonary Science

The PhD program in Health Sciences at Georgia State University will offer a concentration in cardiopulmonary care, housed in the Department of Respiratory Therapy. The program will train students to become leaders in the cardiopulmonary care field with a specific focus on advancing the scientific field of respiratory therapy, educating the next generation of respiratory therapists, and leading healthcare organizations. The training will consist of advanced respiratory therapy and cardiopulmonary care practice, research, education, statistics, and leadership. This program will also consist of training in professional development and dissertation research pertaining to health sciences with a focus on cardiopulmonary care. Graduates of this program can expect to find career opportunities in private and public healthcare leadership, academic appointments, and scientific advisors for medical and pharmaceutical companies. This program is intended to fill a critical gap in graduate programs for respiratory therapists and will be integral to advancing the field.

Department of Respiratory Therapy

The Department of Respiratory Therapy (RT) housed in the Byrdine F. Lewis College of Nursing and Health Professions, otherwise, known as The Lewis College was founded in 1969 and offered the first baccalaureate program in Georgia and is the second oldest in the United States. Currently the department has 10 salaried faculty members and a medical director. The Department of Respiratory Therapy offered the first Master of Science (MS) degree for respiratory therapists in 1988. The Master of Science in Health Science with a

concentration in Respiratory Therapy is a 36-hour Master of Science for students with a BS in respiratory therapy. This program is focused on advanced RT clinical, educational and leadership offerings. For students that have an undergraduate degree other than respiratory therapy the department was the first public university to offer a direct entry master's degree program in 2007. The program allows graduates the ability to sit for the National Board for Respiratory Care examinations. Recently the department added an Online MS degree program. This program offers RTs with a BS degree the opportunity to earn a MS in RT from anywhere in the world. The program can be completed in as little as 3 semesters. All MS programs meet SACS-COC requirements, offering over 18 credit hours in RT education. All Graduate students have an option of completing either a thesis or non-thesis project for their degree. The Department of Respiratory Therapy is excited to offer this new PhD program for respiratory therapist to support development of even stronger researcher capabilities and continue find the answers needed to breathe easy!

For more information, please email Doug Gardenhire at dgardenhire@gsu.edu

CoBGRTE NBRC Doctoral Scholarship Awards

The CoBGRTE Board of Directors is pleased to invite applications for two, NBRC supported, \$10,000 scholarships. The intended recipient is a CoBGRTE member and a registered respiratory therapist pursuing a doctoral degree. The application criteria include being enrolled in a doctoral program, letter of support from the department chair or a committee chair, and submission of a 'vision' paper that describes: 1) how they plan to use their degree to advance their practice/profession/patient care, or 2) how the degree and subsequent work will close a particular gap in the existing research, or 3) why they are pursuing a doctoral education and how they plan to use it.

Applicants must submit their vision paper, curriculum vitae, and letter of support to the CoBGRTE scholarship committee chair by 1/31/2022. Award recipients will be announced in February 2022. The CoBGRTE Board of Directors thanks the NBRC for their financial support of this initiative.

Submit materials to:

CoBGRTE NBRC Doctoral Award Committee

Attention: José D Rojas, PhD, RRT, RPFT, FAARC

jdrojas@utmb.edu

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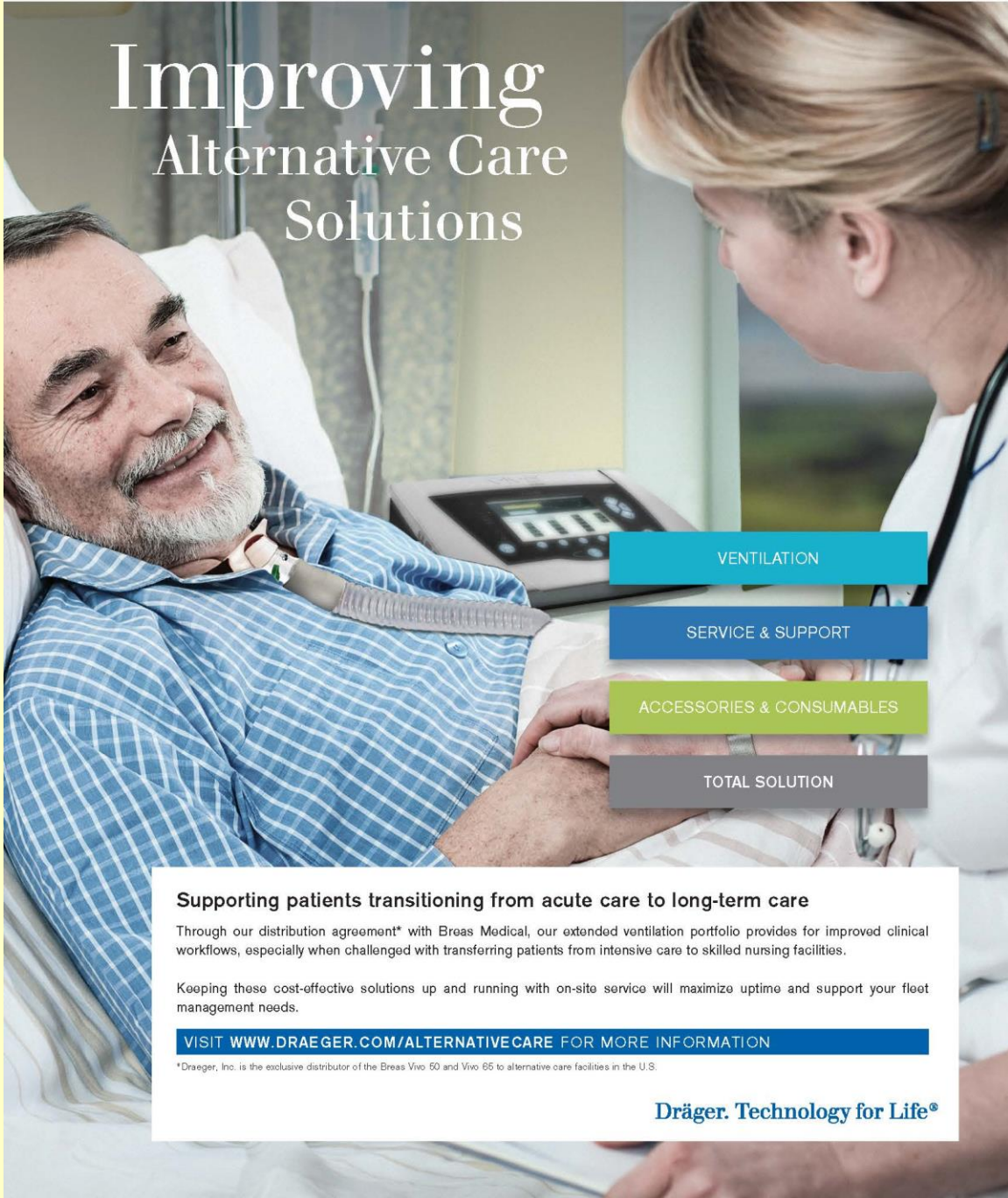
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Are you looking to expand your knowledge base? Focus on the education or research side of respiratory care? We invite you to check out the AARC's Leadership Institute.

Dräger is supporting the AARC, through an unrestricted education grant, to provide a scholarship to 3 qualified RRTs for either the Education or Research track on an annual basis for a minimum of ten years.

Simply fill out the scholarship form before Feb. 17, 2022. An AARC panel will review all applications and identify 3 deserving recipients for a FULLY PAID SCHOLARSHIP in either the Research or Education track.

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We wish all applicants the best of luck for your future goals!

[AARC Leadership Institute Education/Research Track Scholarship Application - AARC](#)

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If you haven't already decided to become a CoBGRTE member after visiting www.cobgrte.org, the following are 14 reasons why you should join the coalition.

Reasons Why You Should Become a CoBGRTE Member

1. Award scholarships to baccalaureate and graduate respiratory therapy students.
2. Assist in the development of ASRT to BSRT Bridge Programs.
3. Collectively work towards the day when all respiratory therapists enter the profession with a baccalaureate or graduate degree in respiratory care.
4. Support a national association, representing the 70 colleges/universities awarding baccalaureate and graduate degrees in respiratory care, to move forward the recommendations of the third 2015 conference.
5. Help start new baccalaureate and graduate RT programs thus leading to a higher quality of respiratory therapist entering the workforce.
6. Work to change the image of the RT profession from technical-vocational-associate degree education to professional education at the baccalaureate and graduate degree level.
7. Mentoring program for new graduates as well as new faculty members.
8. Join colleagues to collectively develop standards for baccalaureate and graduate respiratory therapist education.
9. Develop public relations programs to make potential students aware of baccalaureate and graduate respiratory therapist programs.
10. Help to publicize, among department directors/managers, the differences between respiratory therapists with associate, baccalaureate and graduate degrees.
11. Access to over 75 Spotlight articles on BSRT and RT graduate programs, and major medical centers.
12. Round table discussion dinners and Meet & Greet member receptions held in conjunction with the AARC Summer Forum and the International Congress.
13. Help to support maintaining a roster and web site for all baccalaureate and graduate respiratory therapist programs.
14. Collaborate with CoARC and AARC to improve respiratory therapy education.

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