

Dear Colleague,

We would like to take this opportunity to provide you with information on some of the exciting clinical and research endeavors within the pulmonary and critical care medicine programs at NewYork-Presbyterian Hospital. The Division of Pulmonary, Allergy and Critical Care Medicine at NewYork-Presbyterian/Columbia University Medical Center and the Division of Pulmonary and Critical Care Medicine at NewYork-Presbyterian/Weill Cornell Medical Center are home to nationally and internationally recognized clinicians practicing at the forefront of pulmonary medicine. Through its affiliation with Columbia University College of Physicians and Surgeons and Weill Cornell Medical College, NewYork-Presbyterian offers comprehensive pulmonary and critical care medicine services that continue to expand and strengthen clinical, research, and educational efforts, as well as provide support to a number of related medical and surgical disciplines Hospital-wide.

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Clinical Highlights

NewYork-Presbyterian Hospital's pulmonology programs integrate patient care, research, and educational activities to develop and employ the most advanced diagnostic and treatment approaches to pulmonary and critical care medicine.

NewYork-Presbyterian/Columbia's Division of Pulmonary, Allergy and Critical Care Medicine provides expertise in lung transplantation, cystic fibrosis, interstitial lung disease, asthma, chronic obstructive pulmonary disease, and tuberculosis. Programs of note include:

Center for Acute Respiratory Failure.

In 2011, NewYork-Presbyterian/Columbia established the Center for Acute Respiratory Failure, which offers expertise in lung bypass technology for adult patients whose lungs are rapidly shutting down. Services include advanced forms of mechanical ventilation and other specialized therapies, including surgical interventions such as pulmonary embolectomy and pulmonary thromboendarterectomy to appropriate patients with acute pulmonary embolism. NewYork-Presbyterian/Columbia is also one of only two hospitals in New York City to use bronchial thermoplasty, a novel and relatively new treatment method for patients



Dr. Neil W. Schluger, whose 20-year academic career at NewYork-Presbyterian/Columbia has focused primarily on tuberculosis, currently chairs the Steering Committee of the Tuberculosis Trials Consortium, an international research consortium funded by the Centers for Disease Control and Prevention.

with severe or recalcitrant asthma. Performed as an outpatient procedure, bronchial thermoplasty uses a bronchoscopically introduced catheter to deliver precisely controlled thermal energy to the airways.

The Center for Acute Respiratory Failure's opening in 2011 coincided with publication of an article in *The New England Journal of Medicine*, authored by Center co-directors Daniel Brodie, MD, and Matthew Bacchetta, MD, detailing how extracorporeal membrane oxygenation (ECMO) can take over the function of the lungs in adults with acute respiratory distress syndrome, giving severely damaged lungs

time to rest and heal. Although ECMO has been available for decades, it has been considered an option of last resort in adults, used sparingly because of the high risk of bleeding, infection, and stroke. However, technology advances have greatly reduced the risks and made ECMO an important option for selected patients with respiratory failure.

“Our program is unique in that we will accept the very sickest of patients and transport them here for treatment of acute respiratory failure,” says Dr. Neil W. Schluger. “We go to outlying hospitals in the tri-state area, start the ECMO treatment there, and then transport the patients to Columbia. We’ve had some spectacular successes here. We’re also looking at expanded indications for ECMO for patients with COPD and as a bridge to transplantation.”

Center for Lung Disease and Transplantation. The Center for Lung Disease and Transplantation performed more than 65 lung transplants in 2012, making it one of the largest programs of its kind in the country. Research studies conducted at the Center continue to improve treatment options, prevent or delay the progression of serious lung diseases, and improve the quality of life and survival for patients. The January 2012 Scientific Registry of Transplant Recipients data reported the Center’s one-month, one-year, and three-year patient and graft survival rates to be well above the national average. In 2012, the Center received the U.S. Department of Health and Human Services bronze award for outstanding performance in lung transplantation; no other hospital in New York State received the bronze award or higher.

The Price Family Center for Comprehensive Chest Care. The Price Family Center is one of the largest and most comprehensive programs focused on care for lung and esophageal diseases in the New York City area. Developed by the leadership team of Dr. Schluger, Selim M. Arcasoy, MD, Joshua R. Sonett, MD, and Byron Thomashow, MD, the Center provides multidisciplinary management of complex lung and gastrointestinal diseases incorporating the most advanced diagnostic and therapeutic approaches.

Gunnar Esiason Adult Cystic Fibrosis Program. The Gunnar Esiason Adult Cystic Fibrosis Program provides state-of-the-art clinical care for patients 18 years of age and older with cystic fibrosis, Kartegener’s disease, bronchiectasis, and related respiratory disorders. It offers a comprehensive

approach to diagnosis and treatment of cystic fibrosis in adults, with specific attention to the transition of patients from the pediatric to adult health care system.

Jo-Ann LeBuhn Center for Chest Disease and Respiratory Failure. As Medical Director of NewYork-Presbyterian/Columbia’s Jo-Ann LeBuhn Center for Chest Disease and Respiratory Failure, Dr. Thomashow – a national leader in the field of chronic obstructive pulmonary disease (COPD) – oversees a program long at the forefront of both treatment of pulmonary disease and research into the causes of chronic pulmonary illness. A state-of-the-art pulmonary diagnostic unit, an exercise physiology laboratory, and a pulmonary rehabilitation center are among the many resources that help some 5,000 pulmonary patients each year.

Interstitial Lung Disease Program. The Interstitial Lung Disease Program optimizes the care of patients with many types of interstitial lung disease, including idiopathic pulmonary fibrosis, hypersensitivity pneumonitis, and pneumoconiosis. The program continues to grow and provide patients with therapy, medications, clinical research studies of new agents, and referral for lung transplantation when necessary.

The John Edsall-John Wood Asthma Center. Conceived by leading investigators and clinicians at NewYork-Presbyterian/Columbia, the Center combines research and education with advanced asthma care, providing the infrastructure for patient participation in a variety of clinical trials that focus on the controlled testing of new drugs and combinations of drugs for the treatment of asthma, as well as studies of the molecular basis of the disease. The Center’s clinicians and scientists have been awarded grant support from the National Institutes of Health and other agencies to focus on patient education and on research to learn more about the causes of asthma. The Center is presently participating in several clinical trials supported by the American Lung Association Asthma Clinical Research Center.

The Division of Pulmonary and Critical Medicine at NewYork-Presbyterian/Weill Cornell provides 24-hour coverage of the Medical Intensive Care Unit, as well as pulmonary consultation for both patients and referring physicians. Its Pulmonary Procedure Suite and Pulmonary Function Laboratory are serving an increasing volume of patients. The Pulmonary Outpatient Practice functions on an open-access group model, with patient visits scheduled within 48 hours.

Dr. Joseph T. Cooke has particular expertise in the management of critical illness, including respiratory failure, sepsis, and multi-organ failure. He is the Chief Patient Safety Officer for NewYork-Presbyterian/Weill Cornell and Chair of New-Presbyterian Hospital's Critical Care Network and Organ Donation Network.



In 2012, Weill Cornell faculty collaborated with colleagues at NewYork-Presbyterian/Columbia to develop clinical pathways that standardize care across both campuses. For example, clear guidelines for steroid treatment for COPD exacerbations do not exist. "Using our expertise across the two campuses, we are implementing evidence-based best practices for our patients," says Joseph T. Cooke, MD. "This assures that our patients are receiving the appropriate medications and testing in a timely fashion and that there is a seamless transition to home care and follow-up at discharge."

Weill Cornell Critical Care faculty have also partnered with their Columbia colleagues to extend the ECMO

program to NewYork-Presbyterian/Weill Cornell, educate housestaff on utilization of ultrasound, and to provide therapeutic hypothermia for victims of cardiac arrest.

The Division plays a major role in evidence-based quality and patient safety efforts, including patient safety rounds and a housestaff quality council, which have effected important changes in practice throughout the institution. "Among the more important initiatives in this area has been the establishment of a Housestaff Quality Council in which our residents are engaged in the process of improving patient care," says Dr. Cooke, who is the Chief Patient Safety Officer for NewYork-Presbyterian/Weill Cornell. The Council was subsequently expanded to include the housestaff of NewYork-Presbyterian/Columbia and was recently awarded the prestigious John M. Eisenberg Patient Safety and Quality Award by the National Quality Forum and The Joint Commission. Since its inception in 2008, the Housestaff Quality Council has partnered with key constituencies to ensure that processes and systems are in place to avoid medical errors. This collaboration produced staggering results, including more than 90 percent compliance with medication reconciliation.

Research Advances

NewYork-Presbyterian/Columbia research faculty include basic, translational, and clinical researchers, and epidemiologists, who maintain active NIH- and CDC-funded research programs in acute lung injury, asthma, cystic fibrosis, lung transplantation, tuberculosis, interstitial lung disease, the adult respiratory distress syndrome, sleep-disordered breathing and obstructive sleep apnea, neuromuscular respiratory diseases, and COPD. In addition, the Division holds an NIH-funded T32 Training Grant in Lung Biology.

In 2012, the NHLBI awarded Columbia researchers R01 grants to study:

- imaging RAGE (Receptor for Advanced Glycation Endproducts) pro-inflammatory signaling and cellular apoptosis in emphysema
- vascular endothelial activation in sleep apnea
- subclinical interstitial lung disease in the MESA cohort

The National Institute of Environmental Health Sciences awarded an R01 grant to Columbia researchers in 2012

to assess the role of short-term black carbon exposure, nickel, and vanadium on DNA methylation and airway inflammation and obstruction in inner city children age 9 to 13 years. Also in 2012, the Division published a widely noted paper in *Nature Medicine* on mitochondrial transfer from bone-marrow-derived stromal cells to pulmonary alveoli and their protection against acute lung injury.

Dr. Neil Schluger serves as Chairman of the Steering Committee of the CDC-funded Tuberculosis Trials Consortium (TBTC), a collaboration of researchers from the CDC, domestic and international public health departments, academic medical centers, and selected Veterans Administration medical centers, whose mission is to conduct programmatically relevant research concerning the diagnosis, clinical management, and prevention of tuberculosis infection and disease.

The TBTC is the largest tuberculosis clinical trials group in the world. NewYork-Presbyterian/Columbia,

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which has enrolled hundreds of patients with TB, has taken a leadership role in conducting research that expands clinical and epidemiologic knowledge of TB.

NewYork-Presbyterian/Weill Cornell researchers under the leadership of Ronald G. Crystal, MD, have been at the forefront of pioneering research in gene transfer strategies to treat the lung manifestations of various genetic and infectious lung diseases. Ongoing clinical studies focus on elucidating the genetic mechanisms responsible for the development and progression of asthma and other smoking-related lung diseases such as lung cancer and COPD. An important area of current investigation is the accelerated development of emphysema in individuals infected with the human immunodeficiency virus.

In 2012, NewYork-Presbyterian/Weill Cornell researchers received a \$6.5 million grant from the National Heart, Lung, and Blood Institute (NHLBI) for a five-year investigation into metabolic changes occurring within airway epithelial cells in the lungs of patients with COPD caused by cigarette smoking. According to investigators, gaining a better understanding of COPD's underlying biology and the metabolic changes forced

by cigarette smoke to airway epithelial cells will help clinicians effectively develop new ways to protect the lungs. Current studies at Weill Cornell also focus on:

- a comparison of seriously ill patients with or without AIDS requiring prolonged mechanical ventilation
- airway epithelial expression of TLR5 down regulated in healthy smokers and smokers with chronic obstructive pulmonary disease
- the use of a single adeno-associated virus gene transfer vector expressing high levels of an anti-nicotine antibody that would persistently prevent nicotine from reaching its receptors in the brain
- biologic phenotyping of the human small airway epithelial response to cigarette smoking

Weill Cornell is also one of 11 centers in the country and the only one in the Northeast/New England/mid-Atlantic regions participating in the NIH-funded Idiopathic Pulmonary Fibrosis Clinical Research Network to evaluate new therapies in individuals with idiopathic pulmonary fibrosis. In the inpatient setting, ongoing studies assess new therapies for nosocomial pneumonia and the relationship between vascular endothelial growth factor and pulmonary edema.

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