Key Issues Dialogue: Alpha-1
Featuring Steven Nathan, M.D.; John W. Walsh;
Robert D. Lefebvre and Dennis Jackman
About Alpha₁-Antitrypsin

Alpha₁-antitrypsin (Alpha-1) is a protein that is produced mostly in the liver. Its primary function is to protect the lungs from neutrophil elastase. Neutrophil elastase is an enzyme that normally serves a useful purpose in lung tissue—it digests damaged or aging cells and bacteria to promote healing. However, if left unchecked, it will also attack healthy lung tissue. Alpha₁-antitrypsin, in sufficient amounts, will trap and destroy neutrophil elastase before it has a chance to begin damaging the delicate lung tissue. Consequently, if an individual doesn’t have enough Alpha₁-antitrypsin, the enzyme goes unchecked and attacks the lung.

Most people have two normal copies of the Alpha₁-antitrypsin gene. People with Alpha-1 may have one normal copy and one damaged copy, or two damaged copies. Most Alphas with at least one normal gene can produce enough Alpha₁-antitrypsin to stay healthy, especially if they don’t smoke.

However, people with two damaged copies of the gene can’t produce enough Alpha₁-antitrypsin, which can cause several conditions. They are often diagnosed with emphysema as their primary disease. Other common diagnoses include COPD (chronic obstructive pulmonary disease), asthma, chronic bronchitis, and bronchiectasis. Alphas are usually quite susceptible to lung infections. In the Alpha-1 patient, any of these conditions can cause further damage if they aren’t treated right away.

Another disease that some Alpha patients develop is cirrhosis of the liver. This scarring of healthy liver tissue affects Alpha-1 infants, as well as 12 to 15 percent of adult Alphas. Unfortunately, there is no cure for cirrhosis of the liver, regardless of its cause. Cirrhosis can be managed as a chronic condition if caught early and protective steps are taken. Still, a liver transplant is currently the only option available for advanced disease.

More rarely, Alphas may also have a disease known as panniculitis. Panniculitis is an inflammation in the fatty tissue under the skin. It can occur in both children and adults.

Alphas and physicians regularly speak of a patient’s “primary disease.” This means the principal way the deficiency is manifested in a given patient, whether in the lungs, the liver or the skin.
Diagnosis and Treatment

DENNIS JACKMAN: How many Alphas do you think are under-diagnosed or undiagnosed today?

JOHN WALSH: According to the blood bank studies, the prevalence is about the same as cystic fibrosis, so there should be about 90 to 100,000 people. Based upon some of the recent studies among people who have chronic obstructive pulmonary disease in Florida, it could be much higher than that—upward of 200,000.

DENNIS: What are the main causes for under-diagnosis or lack of diagnosis?

DR. STEVEN NATHAN: I think it’s mostly a function of the fact that this is a rare condition and is not very commonly picked up. On average, a physician has to test 30 patients before getting a positive hit. And you can talk as much as you like about Alpha-1, if physicians don’t get a hit four, five, ten times, eventually they stop testing. That’s part of the problem as well with COPD in general. We all see patients who haven’t been tested.

Also, COPD is a diagnosis of creep. What I mean by this is patients creep into the diagnosis. What happens in practice a lot of times is patients go to see their family practice physician, internist or get seen in an emergency room and are told, “Oh, by the way I think you’ve got a touch of emphysema or a touch of COPD.” Then the patient sees two or three physicians along the way carrying this diagnosis appropriately or inappropriately. And no one’s ever thought to test them along the way.

DENNIS: What can be done to educate people about diagnosis and awareness of the disease?

JOHN: My twin brother and I were both diagnosed with allergy-induced asthma at 35 years old. If we had not had an extensive family history to look at, I don’t
think it would have been diagnosed for years. But at 40 years old, we realized that Mom died at 46 of early-onset emphysema. All of a sudden, it was thought, why don’t we test the Walsh brothers for this Alpha-1? So I think that’s a typical progression of diagnosis from allergies, asthma or emphysema.

The Alpha-1 Foundation has invested more than $250,000 in the development of the standards for the diagnosis and the treatment of individuals with Alpha-1, hoping that at last we would have a platform to work from to get physicians to realize that all individuals with COPD must be screened for Alpha-1. And that’s hardly moved at all. The docs don’t have time in the current setting of managed care. The specialists don’t have time, let alone a primary care physician. They can’t even do simple spirometry to test for COPD.

DENNIS: Is that because of lack of time or lack of expertise?

JOHN: Both. My feeling is that it’s time to engage the population with COPD directly. If it’s not direct to consumer, it’s a waste of money. We need to make certain that everybody with COPD, that reads anything about COPD, that has any contact with other individuals with COPD is told about Alpha-1 and the importance of the genetic risk factor(s). We’re involved with an international activity to have emphysema-related COPD patients get the preventable-treatable message. I think that’s going to catch hold but it will take a long time.

DENNIS: That presumes you know who the Alpha-1 patient is.

JOHN: That’s one of the reasons we started the COPD Foundation: to embed Alpha-1 in COPD. One thing that I think will happen is that the physicians, as well as individuals with COPD, who don’t even consider genetics as a risk factor for COPD, will begin to do so. The recognition of the genetic predisposition(s) to developing COPD will help take the stigma (shame and blame) out of the diagnosis of COPD. It’s familial, it’s genetic. The genetic epidemiology study in COPD that we hope will be funded by the NIH is going to include 10,000 people in a genome-wide association study. Within the next five years or so there will be a much better understanding of and appreciation for the genetic impact in COPD.

DENNIS: So the linkage to COPD is part of the strategy for increased awareness and diagnosis.

STEVEN: Another place for significant inroads is to institutionalize testing for Alpha\(_1\) -antitrypsin deficiency. By institutionalizing it, I mean test all patients who are admitted to the hospital with a COPD exacerbation or asthma that doesn’t show full reversibility.
DENNIS: Would further guidelines for diagnosis and treatment help?

JOHN: This is where the Alpha-1 Foundation’s focus on advocacy and early detection comes in. The Standards for the Diagnosis and Treatment of Alpha-1 Antitrypsin Deficiency published by the American Thoracic Society and European Respiratory Society in 2003 has created a platform to create more awareness and early detection. Initiatives to make testing of at-risk individuals mandatory by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), Medicare and integrating an automatic “flag” for testing in electronic medical records will result in institutionalizing early detection.

DENNIS: So it will take guidelines before people will start changing their behavior?

JOHN: In terms of guidelines, if you look back at some of the papers that have been written, there was a good review on COPD in *The New England Journal of Medicine* from a couple years ago. Prior to that there was a big review in *JAMA* where they provide very nice, fancy diagrams and grids of how you should manage patients based on their FEV1 and talk about lung transplant, lung volume reduction, common rehab and oxygen therapy. All appropriate. But nowhere is there mention of testing patients for Alpha_1_-antitrypsin deficiency.

STEVEN: I think the American Thoracic Society for one and American College of Chest Physicians are two big governing bodies that should take a role in this.

Corporate Roles

DENNIS: Bob, CSL Behring is engaged in this therapeutic area. What do you think the role of companies should be in helping to educate and increase awareness and diagnosis?

BOB LÉFEBVRE: One way is to work in concert with professional bodies and take those best practices back out to the field. Another way is to support and partner with Alpha-1 Foundation and other associations that have that education objective in mind. As a company we’re also encouraging diagnostic procedures and protocols on how to support physicians actually engaging in the diagnosis procedures. We have a key role in contributing to knowledge about the condition and its treatment, as well as assuring that our therapies are safe, effective and reliably supplied.

Reimbursement

DENNIS: Do you have any challenges in the reimbursement field in terms of diagnosis or treatment of Alpha-1?
STEVEN: We haven’t really had any impediments in terms of testing for Alpha-1 levels or phenotyping. Most of the patients have been appropriate candidates for therapy. In terms of supplementation therapy, I’m sure there are some patients whose insurance doesn’t pay or who don’t qualify for compassionate programs.

JOHN: As far as reimbursement for augmentation therapy, we continue to fight those battles, but generally, insurance companies will reimburse for augmentation therapy. The challenge is the co-pays.

DENNIS: What percentage of your patients are on Medicare?

JOHN: About 30 to 33 percent are in Medicare/Medicaid.

DENNIS: What are the biggest reimbursement challenges for a Medicare participant?

JOHN: Medicare pushes patients into a clinic, hospital or physician’s setting—an infusion setting. Why would you ever want to send somebody with a compromised immune system into a setting where they’re exposed to all those germs? So we’re working closely with CSL Behring and advocating for a home infusion benefit.

Forms of Therapy

DENNIS: What other forms of therapy is CSL Behring looking at?

BOB: Something we’re evaluating that could bring tremendous value to patients is a different mode of administration—subcutaneous. We’ve had experience with it in the immune globulin space with Vivaglobin® where patients who are in need of primary immune deficiency treatment with immune globulins are able to use product in a subcutaneous form as opposed to an I.V. form.

STEVEN: I think subcutaneous would be a great alternative. We do subcutaneous insulin infusions all the time. In pulmonary hypertension, we give some subcutaneous infusions as well.

BOB: The technical challenges to be faced include getting the right levels in through that mode of administration.

STEVEN: Just a word on inhalers. As physicians, it’s very attractive for us to talk about lung transplantations. The lung is a very fragile organ and when you transplant it, it has a direct communication with the outside environment. Patients are breathing microbes into an immune-compromised host who’s on
immunosuppressive therapy. But by the same token we are very limited in health therapies available for pulmonary patients at this time outside the standard inhalers. But if you’re looking at intravenous versus inhaled therapy, I think this is an ideal target disease where something like this should be further developed.

Bob: We have been evaluating aerosolized therapies at CSL Behring for a number of years and are continuing to do so.

John: The Alpha-1 Foundation convened a Critical Issues Workshop on Aerosol Therapy in 1999 and invited experts in therapeutic deposition, aerosol delivery and drug development from around the world and representatives from the FDA, the NIH and our Alpha-1 community. By identifying and targeting the impediments of developing aerosol delivery technology, industry and government accelerated the progress of therapeutic development and several companies are now committed to product development.

Dennis: What other treatment options are available for patients?

Steven: For Alpha-1, none that I’m aware of short of experimental types of therapies. And for those who develop emphysema, just the standard COPD type of medications: bronchodilators, inhaled steroids and other such medications. You know, there are various medications and things that have opened up to try to increase Alpha-1 from the liver but nothing has really panned out as yet.

There are a couple of points to be made about endobronchial valves. First, lung volume reduction is good for just a very small sub-group of patients with COPD and unfortunately Alpha-1 patients don’t tend to fit into that category. Also, the endobronchial valves are something new and experimental that are still being worked on in the COPD population in general. There are a couple of different options in terms of one-way valves in particular and endobronchial glue substances to cause endogenous collapse of lung and thereby induce lung volume reduction. There have been some reports attesting to this as a potential modality of treatment and there are a couple of prospective trials.

Lung transplantation is the safety net for many forms of advanced lung disease when all else has failed. This raises an important point about Alpha-1-antitrypsin deficiency and the importance of diagnosing it early. If you do diagnose it early, and treat it appropriately with I.V. supplementation therapy, how many patients could you prevent from going on to needing lung transplantation?

John: Those of us on augmentation therapy are convinced that we’ve improved our quality of life and extended our lives significantly. However, many of us are convinced that we need to better evaluate and understand if...
we’re on the correct dosage. I don’t react to the 60mg/kg/week regimen and have experienced much better protection on a 90mg/kg/week regimen. We need studies to optimize dosing levels.

**STEVEN:** That’s a very valid point. Not everyone needs the same dose. What is the end point to know short of obtaining the serum level and seeing what the trough is?

As techniques evolve radiographically, we’re getting much better at imaging the lungs and COPD in general. What it might evolve to is a morphologic classification rather than a physiologic classification that we currently hold.

**DENNIS:** *Bob, do you see a role for CSL Behring in these types of studies now?*

**BOB:** There’s certainly a role for industry in these types of studies simply because we need to be able to demonstrate efficacy and safety for the products that we develop. It’s also our role to advance the level of knowledge around these disease states. The challenge, of course, is to get it in the form that can be seen by regulatory agencies as being evidence of either safety or efficacy.

### Government’s Role

**DENNIS:** *What about the role of the government in advancing the understanding of the condition, the manifestations and treatment?*

**JOHN:** We worked with several members of the voluntary health sector for years to double the National Institutes of Health (NIH) budget and now have to advocate for an increased allocation for lung-specific research and the development of new therapies. We have succeeded in getting appropriations language and established our credibility with the NIH and now need to increase our efforts and get the NIH to put more resources in research on Alpha-1.

**DENNIS:** *The National Heart, Lung and Blood Institute (NHLBI) has put together a panel to develop treatment algorithms around von Willebrand Disease, which is a disease that can result in unnecessary hysterectomies. Now NIH has put together a panel to develop a treatment practice guideline or algorithm. Is this model something that we could see potentially with Alpha-1?*

**BOB:** As far as treatment algorithms, you’ve got the American Thoracic Society and the European Respiratory Society guidelines on Alpha-1 as well as COPD. So I don’t know that more guidelines are needed, and I really don’t know how much of an impact guidelines have on the practice of the community.

**STEVEN:** I think it helps to drive the message home. I think it also helps with HMOs and the various players if it’s in the guidelines.
One Size Fits All?

Dennis: Some people in the reimbursement arena would like to treat infusible therapies as completely generic products. The FDA classifies these as single-source biologics. Are there differences in the therapies—or does one size fit all?

John: I would love to say one size fits all if it was going to decrease the price. The assumption of a generic is once you pass through the licensure and the patent runs out and it goes generic, then the drugs are made more readily available and cheaper. I think hell would freeze over before that would happen. I’d rather see money put in a subcutaneous program or an aerosol program where we know we’re going to improve delivery and probably improve efficacy.

Steven: From a physician’s standpoint and a disease awareness standpoint, what would be ideal—and I know it would be idealistic—is for the companies to work together to increase awareness because you heard the numbers. There are a lot of patients out there. And I think there would be synergy between the companies in terms of having more effective ways to increase disease awareness.

Bob: I have to agree with you. Fundamentally the issues seem to be awareness, detection and being able to identify those patients who can benefit from care. That care may include augmentation therapy, and it may not. But unless you’ve identified those patients, it doesn’t mean anything.

The Liver Side of Alpha-1

Dennis: How much focus should go to the liver side of Alpha-1?

John: The liver disease associated with Alpha-1, basically both infantile cirrhosis and adult-onset cirrhosis, is increasing at alarming numbers. We have an alarming increase in reported cases of adults with no previous liver complications presenting with end-stage cirrhosis. One of the studies that I’m really pushing for with our medical and scientific advisory committee is to do a liver biopsy study of lung patients without any liver symptoms just to see the prevalence. In the PPL transgenic study more than 60 percent of the people with lung disease and no liver symptoms in that study were found to be pre-cirrhotic on biopsy.

Steven: It’s tough because even though Alpha-1 is a deficient state above the diaphragm, it’s a state of overabundance below the diaphragm—and it’s the accumulation of the polymers in the liver that leads to the liver problems. I think the latest statistic from the registry is about 10 to 12 percent of Alpha patients ultimately succumb to liver disease rather than their lung disease.
**Vaccination**

**DENNIS:** John, you’ve been on the advisory committee on blood safety and availability, set up by the Secretary of Health. What do you think its role should be?

**JOHN:** I’m pleased to report that the primary mandate of the committee to increase the public’s confidence in the safety of the blood supply has been achieved. The importance of constant vigilance for the safety and availability of our blood supply, plasma and plasma derivatives remains absolutely essential. The committee will continue to evaluate and react to threats of safety, availability and access. Pandemic preparation is an excellent example of this and the committee’s dialogue has provided valuable input for AlphaNet’s pandemic education, monitoring and health management planning.

**BOB:** Our challenge is to try to understand what has been preventing the American population as a whole from engaging in the appropriate practices when it comes to flu prophylaxis. An at-risk population like the Alpha-1 community, you would think, would be expecting 100 percent take-up.

**JOHN:** AlphaNet has developed and implemented a model comprehensive health management program that addresses the importance of influenza vaccines, pneumococcal vaccine and aggressive treatment of exacerbations. This program needs to be available to all individuals with Alpha-1 and expanded to those with COPD.

**BOB:** I believe the advisory committee has said it comes down to prioritizing vaccination for a pandemic. So I think that there’s probably a comprehensive set of issues here to assure that during such an event people such as Alphas and others would be taken care of.

**About Advocacy**

**DENNIS:** What’s the role of advocacy at the Alpha-1 Foundation?

**JOHN:** I just left a National Health Council board meeting and we just did an environmental scan on the voluntary health sector. It includes fifty-seven organizations representing over 150 million Americans with chronic illnesses. On the average only one percent of the budgets of voluntary health agencies support advocacy and public policy. The Alpha-1 Foundation has committed significantly more resources (four to six percent) to support advocacy, public policy and regulatory affairs. We have successfully challenged the Centers for Medicare and Medicaid Services (CMS) to protect access for augmentation therapy; created a public policy program to increase Congressional awareness.
and NIH funding for research and worked closely with the FDA on various regulatory and product approval issues. Our effectiveness and presence in Washington have led to the perception that we’re a much larger community than we really are.

DENNIS: **Bob, do you see a role in CSL Behring for advocacy in trying to advance patient care?**

BOB: Absolutely. Unless you address how to bring safe and effective products to market and how to ensure that as many patients as deserve them can access them, there’s no value to doing what you do.

DENNIS: *I imagine the physician organizations also see a role in this.*

STEVEN: We’re sort of stuck in the trenches. It’s very frustrating when you want to do a treatment or an intervention then get pushed back by insurers or Medicare. We can fight with insurance agents but a lot of times what you’re dealing with is someone who’s sitting in front of a computer screen reading what’s been handed down to them. And you can send letters to medical directors asking for exceptions in any particular case but that’s all time-consuming. We need advocacy groups and other people taking up the battle too.

**Innovation**

DENNIS: **What’s over the horizon in potential treatment of Alpha-1?**

STEVEN: The buzzword that everybody likes to throw out is genomics. There has been some early stage gene expression in various models and trying to get more Alpha-1 expression that way. Technologically, that has a lot of hurdles to overcome. I think Alpha-1, being a genetic disorder with significant implications, is a good target for gene therapy.

JOHN: The Alpha-1 Foundation has invested 28 million dollars at 52 institutions in North America and Europe in research. And we have a broad research portfolio from basic science to translation of clinical research, all the way to social sciences looking at important issues like end-of-life, informed consent, and genetic discrimination. We have funded gene therapy studies. We put over a million dollars into the University of Florida College of Medicine and are in our second Phase I trial. We think that there’s considerable promise in gene therapy to both the lung and liver and the initial results are quite promising.

We’ve funded stem cell therapy at the University of Minnesota, University of California at Davis, Mt. Sinai and Cincinnati. We continue to support research...
at the Baylor College of Medicine to collaborate with Scripps to target compounds in their high-throughput screening technologies. Wouldn’t it be nice to be able to take an oral therapy that would unfold the protein and release it into the circulatory system; thereby, avoiding both the lung and liver disease associated with Alpha-1?

DENNIS: So this should be of some encouragement then to Alpha-1 people. They can see a whole host of things being looked at and pursued.

Health Management

JOHN: When we first conceptualized forming the Foundation to support the research, we included “improved health” in our mission statement to address a critical need for specific health management coordination. As we organized, we separated this focus out in AlphaNet, as an independent not-for-profit with a primary mission to develop and implement comprehensive health management to our community. AlphaNet is currently coordinating health management services to over 2,700 individuals in all 50 states, Puerto Rico and the Virgin Islands.

We’ve validated the value and effectiveness of a comprehensive health management program delivered by AlphaNet through a network of AlphaNet Coordinators, a clinical support team of medical professionals and our Big Fat Reference Guide (BFRG). AlphaNet’s Medical Director, Dr. Sandy Sandhaus, is publishing some very impressive outcomes data from a three-year outcomes study and the AlphaNet board has approved a five-year extension of this study. The BFRG is now available online (www.alphanet.org) and we feel very strongly that all Alphas should have access to this important resource under the coordination of AlphaNet.

DENNIS: Is this comprehensive, holistic approach the gold standard in health care?

STEVEN: Having a comprehensive guide like that really enables patients to take responsibility for themselves. We focus on that especially in the area of transplantation because we want patients going in to know what their potential outcomes are. The more educated patients are, and the more enabled they are, the better the outcomes in terms of psychological well-being and otherwise. And probably it decreases cost through reduced ER visits.

About Transplantation

DENNIS: What are the biggest challenges in being able to do transplantation effectively?
STEVEN: If I had my way, we wouldn’t have to do transplants. With all the preemptive therapies and new therapies, the purpose is to avoid the need for transplantation. And if we can come up with therapies to avoid the need for transplantation in one disease, it impacts on other diseases because then more organs are available for those diseases.

Another disease where we’ve made significant inroads in terms of therapy is pulmonary hypertension. In 1992-93, there were no FDA-approved therapies for pulmonary hypertension. In 2007 there are five FDA-approved therapies for pulmonary hypertension. If you look back to about 1990, 10 to 12 percent of our lung transplants were for pulmonary hypertension. In 2004 about two or three percent of our transplants were for pulmonary hypertension. So ideally, that’s where we need to be going with all forms of disease.

We just adopted a new lung allocation system that became effective nearly two years ago now. Lungs are now allocated based on perceived need. Everyone gets a lung allocation score based on two factors: what their projected survival is without a lung transplant versus what their projected survival is with the lung transplant. I think that might have impacted the Alpha-1 community in a negative way. Pulmonary fibrosis and cystic fibrosis have benefited. What we are seeing is that the sickest patients are getting transplanted.

What’s Most Important?

DENNIS: What is the single most important thing that can be done to improve the quality of life for Alpha-1 patients?

STEVEN: Detection. Because ultimately, the earlier you detect, the more that will impact subsequently on the patient’s quality of life.

JOHN: I would add that awareness among the family, which will make people much more vigilant about their exposures, and the choices they make both in lifestyle and employment. You wouldn’t want to be a pediatrician if you were an Alpha, or work in a spray-paint booth or be a coal miner or a dental hygienist.

I also think that the more people we diagnose with Alpha-1, the more of an issue it will become. The more people will care about it. The more drugs that would be developed because there would be a larger population.

Where are we going to find individuals with Alpha-1? Public testing or public screening is a waste of time. We need to be really strategic because of the amount of money it costs to do detection. And those that need it the most are already symptomatic. We pray that at some point we can identify Alphas before they have any lung disease with a neonatal test or new birth test.
About the Participants

**John W. Walsh**
*President and CEO, Alpha-1 Foundation*
Mr. Walsh is the co-founder, President and CEO of the Alpha-1 Foundation. Under his leadership, the organization has invested more than $28 million to support Alpha-1-antitrypsin research and programs at 50 institutions in North America and Europe. He is also co-founder and President of AlphaNet, Inc., a disease management services company providing comprehensive care for 2,500 individuals. Due to the support provided by the Foundation and AlphaNet, eight companies have drugs in development for Alpha-1.

Mr. Walsh was diagnosed with Alpha-1-antitrypsin deficiency in 1989.

**Steven D. Nathan, M.D.**
*Inova Fairfax Hospital*
Dr. Nathan is the Director of the Advanced Lung Disease Program and the Medical Director of the Lung Transplant Program at Inova Fairfax Hospital. He is also an Affiliate Professor of Biomedical Sciences at George Mason University. He received his medical degree at the University of the Witwatersrand Medical School in Johannesburg, South Africa. He is board certified in Internal Medicine, Pulmonary Disease, and Critical Care Medicine. Dr. Nathan has been widely published in a number of peer-reviewed journals and publications, including *Chest* and the *Journal of Heart and Lung Transplantation*.

**Robert D. Lefebvre**
*Vice President, General Manager, U.S. Commercial Operations, CSL Behring*
Bob Lefebvre joined CSL Behring in 2006 as Vice President, General Manager, U.S. Commercial Operations. Prior to joining the company, he was Vice President, Global Marketing, MDS Pharma Services, a top five contract research organization. Previously, he was head of the Oncology/Virology Business Unit at Bristol-Myers Squibb. Bob also spent a number of years in sales and marketing management roles with Sandoz Canada.

**Dennis Jackman**
*Senior Vice President, Public Affairs, CSL Behring*
Dennis Jackman is responsible for optimizing impacts on CSL Behring’s ability to provide lifesaving therapies worldwide. Previously, he served as Executive Director of the Plasma Protein Therapeutics Association for North America, the industry group for advocacy, quality standards and communications. He has held senior public affairs positions in the pharmaceutical and biotechnology industries since 1989. Previously, he was senior legislative aide to U.S. Senator Arlen Specter of Pennsylvania, focusing on pharmaceutical, trade and tax policy.

**About CSL Behring**
CSL Behring is a global leader in plasma protein biotherapeutics. Dedicated to saving lives and improving the quality of life for patients with rare diseases worldwide, the company provides safe and effective plasma-derived and recombinant products and offers patients a wide range of related services.
From left to right, Dennis Jackman, John Walsh, Dr. Steven Nathan and Bob Lefebvre