December 31st, 2019

Dear Colleague,

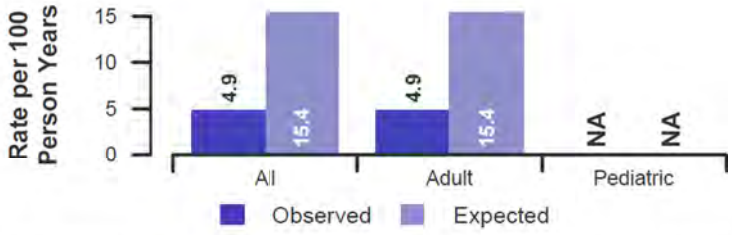
The Inova Advanced Lung Disease and Transplant Program has enjoyed another very successful year with **32 lung transplants in 2019**. In fact, #19 this year marked the **500th** lung transplant performed at Inova Fairfax (woohoo!). Based on the most recent data from The Scientific Registry of Transplant Recipients (SRTR), our average wait time for a transplant is 3.2 months, while our survival statistics continue to be in line with the National averages; one month survival of 100% (U.S 97.32%), adjusted one year survival 88.87% (U.S. 88.98%) and adjusted three survival of 71.39% (U.S.71.22%).

We continue to see the impact of the latest iteration of the lung allocation system (implemented November 2017) which offers lungs out in a 250 mile radius based on the site of the donor hospital. This necessitates higher lung allocation scores to draw lungs, which equates to patients being quite a bit "sicker" at the time of transplant. In fact, **72% (23/32) of our recipients were hospitalized** at the time of transplant vs the national average of 17.5%. These patients are usually hospitalized for high-flow oxygen needs, while 2 patients required pretransplant ECMO support. As a program, we have endeavored to cast a wider net for donor lungs and offer our patients every chance at receiving a lung transplant. Two novel techniques that we have employed include DCD (donation after circulatory death) donors and the use of EVLP (ex-vivo lung perfusion) which is pretty cool stuff and enables "reconditioning" of lungs under direct visualization. In fact, this year as part of a research protocol we employed **EVLP in 12 of our 32 cases** (versus 2 EVLPs cases in 2018).

Our Advanced Lung Disease Program remains robust with the number of patients seen and evaluated increasing to a record 580 new consults this year versus 493 new evaluations in 2018. As of December 2019, there are 74 CMS accredited lung transplant centers, 55 accredited Comprehensive Care Centers for Pulmonary Hypertension, 70 Pulmonary Fibrosis Foundation Care Centers, 117 Cystic Fibrosis Foundation-accredited Care Centers and 54 WASOG accredited Centers in the United States. We are proudly **one of 13** to hold all of these designations. Interestingly, about 16% of our new evaluations traveled >100 miles to see us and ~4.6% were from more than 200 miles away, reflecting our standing as a regional and national referral center. Between all our programs, we follow about 1715 patients (a 12% increase compared with 2018).

A unique advantage of our closely integrated ALD and Transplant programs is that we get to know and follow the patients closely in the pretransplant period. This allows us to evaluate when medical therapy is failing and a lung transplant is needed. This has resulted in a very low wait list mortality rate which we believe is attributable to the care our patients receive pretransplant, coupled with our aggressive pursuit of donor lungs when we get wind of them (pun intended ☺). In fact our pretransplant wait list mortality is **10% better than the expected rate** based on the SRTR data (July 2019)

Figure B4. Observed and expected waiting list mortality rates: 01/01/2017 - 12/31/2018



This raises the question of how best to measure the care provided by a Transplant Program. Indeed, the question that patients should be asking of any transplant program, is not *"what is my projected survival after lung transplantation"*, but rather "*what is my projected survival after first being seen by the program"*, since this incorporates both the post-transplant survival as well as accounting for pretransplant care, timely listing and wait list management. Along the same lines, we continue to explore and implement therapeutic options that forestall or avoid the need for transplant. The latest such "transplant forestaller" is

endobronchial valve lung volume reduction for patients with COPD. The advent of this option has been very timely for these patients who are the one group most disadvantaged by the latest lung allocation score system. It is very difficult for COPD patients to generate a score high enough to receive a transplant. Under the leadership of our Interventional Pulmonologist, **Dr. Bobby Mahajan**, there have been 16 COPD patients who have received valves with very gratifying results thus far. We therefore welcome referrals of a wider spectrum of COPD patients, including non-transplant candidates with a FEV1<45% (the upper limit of the range for valve consideration).

Another attribute of our program is our accrued experience and longevity in the field. Our 6 full-time physicians have been with the Program a total of 58 years (SN-23; OS-14; AWB-9; CK 6, SA-3, KA-3). There have however been some changes to our surgical team. Specifically, Dr. Linda Bogar relocated to Orlando and **Dr. Liam Ryan** has stepped up as our new Surgical Director. I cannot say enough about Liam; simply put, there is no case too complex for him to tackle. **Dr. Dan Tang** has joined us from MCV in Richmond and Dan has assumed the overall Surgical Directorship of Thoracic Transplantation. Completing our highly skilled surgical team are stalwarts **Drs. Eric Sarin and Ramesh Singh**.

On the education front, we enjoyed having **31 Pulmonary Fellows, 8 Medical Residents and 6 observers** rotate with us during 2019. Our fourth Advanced Lung Disease and Transplant fellow, Dr. Vik Khangoora, joined us in July, while our old Fellow Dr. Matt Koslow nailed an ILD job at National Jewish in Denver. Our observers included a Pulmonologist from Brazil (for 1 month) and an ILD physician from the Medical College of Wisconsin (one week). In July we welcomed **Dr. Jean Pastre**, a French Pulmonologist, who is spending a year with us doing ILD research. Be on the lookout for some pretty cool stuff that we hope to get published in 2020 from Jean's work with us. Our summer student research program has also continued to mature with multiple applications (sans any ads) for our 5 available slots, and we actually took on 6 summer students this year.

We continue to hold monthly ILD multidisciplinary meetings as well as monthly pulmonary hypertension multidisciplinary meetings. These are held from 7:30-8:30 am EST on the 2nd Wednesday and 2nd Thursdays of the month. **We invite all referring physicians to participate,** available remotely via GoToMeeting, especially if you have any "tough" cases and wish to solicit input from our group. If interested, please contact us and we can share the meeting invitation/link with you. We have also started a monthly CTEPH meeting as our **CTEPH program** moves steadily to kick-off in 2020.

We have also continued to be very active in research with **36 active research projects and studies.** In 2019 we had a hand in 15 original research manuscripts (accepted or published), 7 reviews, 2 editorials, 2 consensus papers, 2 case reports,1 book and 2 book chapters. On top of that, we had 48 presentations at International meetings this year including the ATS, ISHLT, ERS, CFF, PFF and Chest 2019 meetings. (With apologies for all these acronyms ☺)

We couldn't possibly provide the service we do without your support and ongoing co-management of our complex patients. We pride ourselves on our collaborative style, our close communication, and the relationships we enjoy and foster with our patients' primary Pulmonologists and other providers. We firmly believe that this benefits the comprehensive and cutting edge care that these patients receive. Please feel free to directly call or email any of our Pulmonologists with new referrals, questions, issues, or updates on existing patients (contact info next page). If any patients need to be seen expeditiously, then **please call or email one of us directly** and we will accommodate them earlier.

We wish you, your staff and families a happy, healthy New Year. Thank you for your ongoing support and confidence in our Program.

With best wishes,

Steven D. Nathan

Steven Nathan, MD
Medical Director
Inova Advanced Lung Disease and Transplant Program

2019: end of year pics

Docs

Back row: Drs. Shambhu Aryal, Oksana Shlobin, Vik Khangoora, Kareem Ahmad and Chris King
Front row: Drs. Whitney Brown and Steve Nathan

Patients

Two grateful lung transplant recipients that validate what we do and help maintain our passion and motivation ☺ (with permission).

The gift of life enables life! Nothing more gratifying than a lung transplant recipient with post-transplant progeny!

INOVA ADVANCED LUNG DISEASE AND TRANSPLANT REFERRALS

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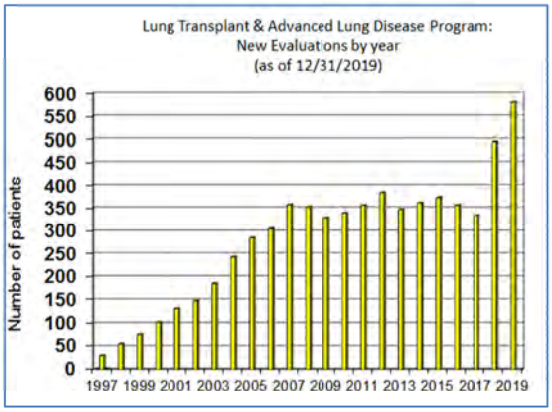
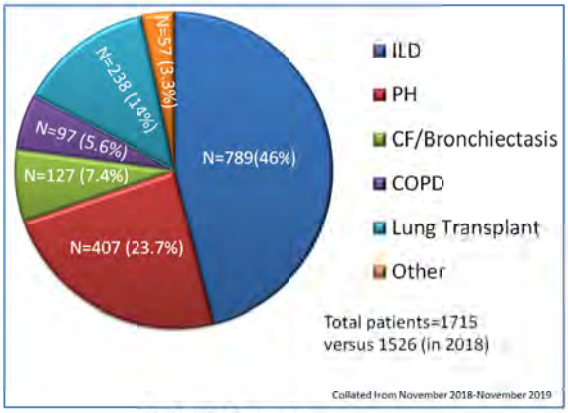




Patients followed

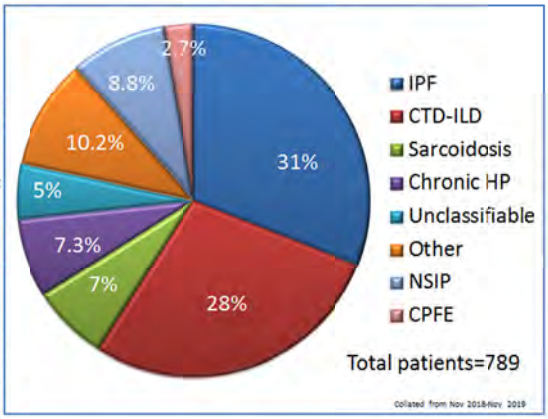
Check us out at: www.inovalung.org

Interstitial Lung Disease Program (by Chris King, MD)

This has been an exciting year with a number of changes in the field of ILD and the Inova ILD Clinic. With regards to the changing landscape of ILD treatment, nintedanib is now approved for the treatment of scleroderma-associated ILD and will likely soon be FDA-approved for the treatment of other non-IPF progressive fibrotic lung disorders. The Inova Advanced Lung Disease and Transplant Clinic is proud to have participated in the pivotal trials that led to these groundbreaking developments in the field. We would also like to thank all the patients and referring physicians who made this research possible. Our ongoing commitment to research in ILD continues. We are actively enrolling patients in the ISABELA1 study (https://clinicaltrials.gov/ct2/show/NCT03711162), a phase 3 trial of a novel antifibrotic therapy which can be added to background antifibrotic therapy. We also are enrolling in the PULSE study of inhaled nitric oxide for Group 3 pulmonary hypertension in patients with ILD (https://clinicaltrials.gov/ct2/show/record/NCT03727451?term=bellerophon+and+sarcoidosis&rank=1). The New Year will bring new studies - with multiple IPF studies projected to open at our Center in 2020.

The Inova Advanced Lung Disease and Transplant Clinic has also undergone a number of changes. First, we would like to welcome our new lead coordinator, Patricia Jackson. Patricia is a former cardiac critical care nurse who has quickly assimilated to her role and become a subject matter expert. She will lead a three coordinator team that will help manage this complex patient population. Our improved staffing has allowed us to develop some patient friendly combined ILD clinics. Dr. Alva Roche-Green, of the palliative care service, has joined our team and we now offer combined pulmonary and palliative care visits to patients with advanced lung disease and severe symptoms or end of life needs. We will also be launching a combined pulmonary-rheumatology clinic for complex connective tissue tissue-associated ILD or sarcoid cases. Dr. Pragya (Pooja) Singh of Inova Rheumatology together with Drs. Oksana Shlobin and Shambhu Aryal will be leading these efforts. The focus will be on complex cases requiring advanced immunosuppression such as rituxamab, IVIG, cyclosphosphamide, and infliximab. Finally, we are always looking for ways to improve access to our patients and referring physicians. As Steve mentioned in his opening to this letter, we have developed a way for clinicians to call in to discuss cases at our monthly multidiscliplinary pulmonary pathology conference. If you wish to be added to the mailing list, please email Christopher.king@inova.org who can help facilitate. Also if you ever have questions, feedback, or inpatient or outpatient referrals feel free to call Chris King at 703-953-7837. 2019 was a year of great advances in the field of ILD. We look forward to continued progress in 2020.

Pulmonary Fibrosis Foundation Charity Walk (National Harbor October 12th, 2019)



The Spectrum of ILD seen in the Inova ILD Clinic in 2019

CYSTIC FIBROSIS FOUNDATION
ADDING TOMORROWS

2019 Cystic Fibrosis Center at Inova Adult Program Update (By Dr. A. Whitney Brown)

The CF Center at Inova Adult Program continues to grow in size and currently cares for 115 adults. This increase in patient numbers represents 21% growth in 2019. In terms of CF patient distribution, 19 (17%) of our patients have advanced lung disease, 18 (15%) have had a lung transplant, and the remaining 78 (68%) represent a more standard CF population.

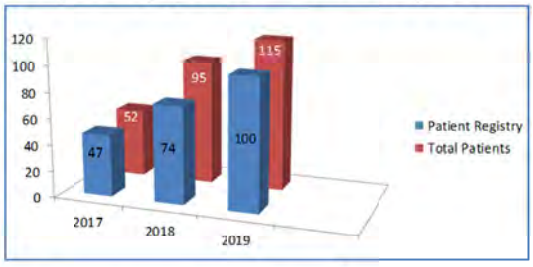
The big news in CF in 2019 was the FDA approval of Trikafta (elexacaftor/tezacaftor/ivacaftor) on October 21st. This triple combination CFTR modulator is approved for patients with at least one copy of the F508del mutation (85% of all patients). Its impact on lung function, quality of life, body mass index, and pulmonary exacerbations renders it the most impactful therapeutic advance in CF to date.

In the spirit of patient and family centered care, **we launched a Patient Family Advisory Board (PFAB)** in June 2019. We had our first meeting in June 2019 and have continued to meet monthly with consistent participation from at least 4 patient/family members at each meeting. The PFAB is currently working with the hospital respiratory therapy leadership to improve the inpatient care experience as it pertains to airway clearance practices. **We are using our PFAB patient advisors to direct and prioritize future QI activities**.

This year we have been successful in applying for and securing the **CF Physical Therapy Grant** as well as the **Program of Adult Care Excellence Grant** for Dr. Kate Gibson, one of our Inova hospitalists and Co-director of our Acute Pulmonary Inpatient Unit. We feel confident that more closely partnering with Dr. Gibson will result in improved inpatient care and patient experience for our patients. In addition, we created **an admission tip sheet for patients** with information on what to expect and what to bring to inpatient hospitalizations. As a result, >90% of our adult patients state that they felt prepared for any needed hospitalizations.

We have a robust CF specific pulmonary rehabilitation program that was uniquely created by our CF team in 2018 that has proven invaluable in the support of our patients across the spectrum of disease severity. We presented the outcomes of our program at North American Cystic Fibrosis Conference (NACFC) in October. In 2020, we plan to write a manuscript on our experience to increase awareness, both for the pulmonary rehabilitation and CF communities.

We provide a **webinar update after NACFC** each year to share what we learned with our patients and families. This provides each multi-disciplinary team member an opportunity to share the latest developments/best practices in their discipline with our patient population via a virtual platform.



Inova Adult CF Team (From left to right): Elizabeth Davies, SW; A. Whitney Brown, MD; Lauren Marinak, NP; Melissa Bowen, RN; Quyen Duong, RRT; Erin Lopynski, RD

Pulmonary Hypertension Program (by Oksana Shlobin, MD.)

Under the directorship of Dr. Oksana Shlobin, the Pulmonary Hypertension (PH) Program at Inova Fairfax Hospital continues to grow. In 2014, our program was one of the first 6 programs to undergo a rigorous process of accreditation by the Pulmonary Hypertension Association. In early 2019, the program was re-accredited and remains the only Comprehensive Care Center in the Greater Washington DC area.

Our medical team continues to grow. In addition to clinical pulmonologists (Drs. King, Nathan, Ahmad, Aryal and Brown) and Dr. Mitchell Psotka (an advanced heart disease cardiologist with expertise in pulmonary hypertension), we have three dedicated full time PH RN coordinators (Shanna Guzman, Johanna Coughlin and Alicia Echols). Nikki Sisserson, a critical care PA, joined our program from Georgetown University as an inpatient care provider to help facilitate a seamless transition between inpatient and outpatient care. Dr. Abbas "Reza" Emaminia was recruited from Columbia and joins two experienced echocardiologists, Drs. Sears-Rogan and Joan Zhao, to further develop our right ventricular (RV) imaging program using sophisticated cardiac RV targeted MRI protocols, 3-dimensional echocardiography and cardiac PET imaging.

A goal for this year was to identify a team of clinicians to provide the full range of care to patients with chronic thromboembolic pulmonary hypertension (CTEPH). Our multidisciplinary PH team has been enriched with the recruitment of Dr. Dan Tang from VCU, a cardiovascular surgeon with experience performing pulmonary thrombo-endarterectomies (PTEs). In addition, we have assembled and trained a team to perform balloon pulmonary angioplasty (BPA) on CTEPH patients with inoperable disease. Dr. Melanie Atkins is our thoracic radiologist with expertise in the interpretation of pulmonary vascular and cardiac specific imaging including V/Q scans, dual energy CT angiography, and cardiac MRI, while Dr.Emaminia will lend his expertise in the assessment of the RV using 3-dimensional echocardiography. Dr. Paul 'Reha" Butros (interventional radiology) and Behnam Tehrani (interventional cardiology) will be performing our BPAs, after undergoing training for the procedure in Japan.

Another program launched this year is a monthly multidisciplinary congenital heart disease clinic with a goal of providing comprehensive care to this complicated group of patients. It is currently staffed by experienced congenital heart disease clinical staff, congenital cardiac surgeon and a PH physician.

Our clinical practice continues to expand. We now **follow over 400 pulmonary hypertension patients** of various etiologic groups. In addition to providing cutting edge clinical care, we remain committed to clinical research. Patients are offered an opportunity to participate in a variety of clinical trials: we currently have four active PH registries, nine industry sponsored trials for various groups of PH, including Group 1 PAH, HFpEF-PH, sarcoidosis PH, COPD-PH and ILD-PH.

Our team members continue to present at international, national and regional conferences including ISHLT, ATS, Chest, ERS, PHA and PHPN, and contribute to research in the field of PH. In addition, our team continues its participation in PH-related activities in various organizations. Dr. Shlobin is a member of both the Oversight and Scientific Leadership Committee for PHA, and was a PH council representative for the 2020 ISHTLT planning committee. Dr.King is a member of the Guidelines Oversight Committee for ACCP.

We continue to be active in outreach to increase awareness of this disease and provide education to both the provider and patient community. A regional monthly multidisciplinary pulmonary hypertension meeting to discuss cases and provide didactic education on pulmonary hypertension topics is held monthly. In addition to our staff, it is frequently attended by providers from regional hospitals including NIH, Washington Hospital Center, and the University of Maryland. If you are interested in virtual or in-person participation, please contact Julieth Munoz at astrid.munoz@inova.org.

Our second annual hospital wide Pulmonary Hypertension Education Day targeting nursing and midlevel staff was successfully held in fall of this year with over 120 participants. We look forward to an equally active and exciting 2020 and would like to thank all our referring providers for your support!

Left pic: at the **2nd Annual Pulmonary Hypertension Education Day**: (left to right) Julieth Munoz, Shanna Guzman RN, Johanna Coughlin RN, Alicia Echols RN, Aaron Bagnola Pharm D, Andrea Grajeda, Patricia Jackson RN, Oksana Shlobin MD.

Right pic: Chris King MD, Mitch Psotka MD, Aaron Bagnola Pharm D, Oksana Shlobin MD, Daniel Tang MD

In April, we participated in the inaugural NoVA PHA sponsored 5K which brought together patients, families, friends and PH clinical teams from various institutions of the Greater Washington DC area. Team Inova PHAngels contributed $5,000 to the event that raised a total of $30,000.

Pictured at the **1st Northern Virginia PHA sponsored 5K:** Team PHAngels**.** Steven Nathan MD, Oksana Shlobin MD, Christopher King MD, A Whitney Brown MD.

We welcome you referrals and are dedicated to partner with you in care of this complicated patient population.

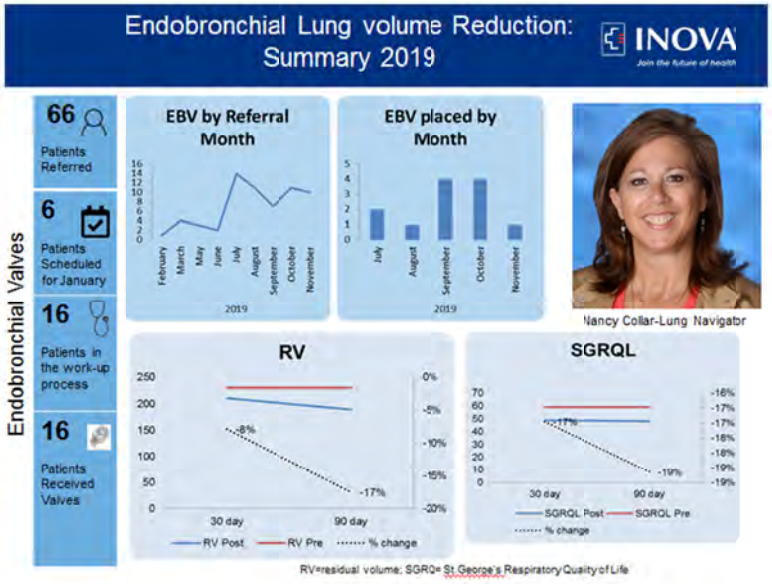
Please do not hesitate to reach out to Dr.Oksana Shlobin (Oksana.shlobin@inova.org or (703) 776-2256) or Dr.Christopher King (Christopher.king@inova.org or (703) 776-4979). Referrals can be directed to our dedicated intake coordinator Andrea Grejada via email Andrea.Grejada@inova.org, (703) 776-6168 or fax (703) 776-3515).

Bronchoscopic Lung Volume Reduction (by Bobby Mahajan, MD and Nancy Collar, Lung Navigator)

Endobronchial Valves for Lung Volume Reduction (EBV) or Bronchoscopic Lung Volume Reduction (BLVR) is a procedure where endobronchial valves are placed with the goal of reducing hyperinflation. The Zephyr Endobronchial Valves were approved by the FDA in June 2018. This procedure has been studied since the early 2000s. The studies revealed the success of the EBV procedure is directly related to the lung destruction and fissure completeness. This lung destruction is assessed by the use of a HRCT and StratX analysis. The StratX system analyzes every mm slice of the lung tissues, assigning a % destruction score. The targeted lobes must have a destruction of > 50% with complete fissures. We test the fissures during the bronchoscopy procedure, using the Chartis system, which measure collateral ventilation.
Our first Endobronchial Valves for Lung Volume Reduction were placed on July 15, 2019. By the end of 2019, we have performed **16 procedures** with very gratifying results.
We have received 65 referrals thus far from pulmonologists in our area, as well as more distant areas in Virginia and Maryland. Our comprehensive team is led by Interventional Pulmonologist, Dr Bobby Mahajan, with support from Anesthesiologists, Thoracic Physicians Assistants, Respiratory Therapists (RTs), including Pulmonary Diagnostics and Pulmonary Rehabilitation RTs.
Inclusion criteria for EBV consideration:

- Confirmed diagnosis of COPD
- Non-smoking
- FEV_1 < 45% predicted (post bronchodilator)
- RV > 150%
- TLC ≥ 100%
- Breathless despite optimal medical management (mMRC ≥ 2)

For any potential cases, please notify Nancy Collar, Lung Navigator at 703-776-4712 or email nancy.collar@inova.org



Alpha 1 Antitrypsin Update (by Kareem Ahmad, MD)

Alpha 1 antitrypsin treatment has been present since 1988 with the FDA approval of a protease inhibitor, Prolastin-C. In the last few decades additional agents for augmentation therapy have become available. Therapies have been targeted to patients with moderate to severe disease, excluding those with early disease and those severe enough to be considered for lung transplantation. Unfortunately there have been no recent significant developments for this cohort of patients. Care has been driven predominantly by trends in the management of chronic obstructive lung disease in general, for emphysema and chronic bronchitis. At the Inova ALD and Lung Transplant clinic we are working to help provide more opportunities for these patients including access to augmentation therapy, pulmonary rehabilitation, lung volume reduction by endobronchial valve placement, and lung transplant. We have historically been closely involved in our local chapter of the Alpha-1 Foundation, both providing speakers and hosting meetings on campus. Resources for education and support are readily available to patients seen in clinic.

Most recently, Vertex, best known for their work in cystic fibrosis, has proposed a series of **phase 2 studies of two new small molecule agents that could potentiate the release of intrinsically produced alpha-1 antitrypsin**. This is exciting as it could eliminate costly and cumbersome infusions by replacing them with an easy to take oral agent. Most importantly, earlier therapy may help prevent these patients from developing debilitating emphysema. We currently expect to begin enrollment in early February 2020 for the trial. Patients currently on augmentation therapy are eligible after completing a wash-out period, but those who are not on any augmentation therapy are open to enrollment immediately.

If you have any questions about enrolling a patient in these upcoming trials, please contact the site principal investigator, Kareem Ahmad (tel: 703-776-4303; email: kareem.ahmad@inova.org) or the research coordinators: priscila.dauphin@inova.org / jennifer.pluhacek@inova.org.

Sarcoidosis (by Dr.Shambhu Aryal)

Pulmonary sarcoidosis has been a vital part of Inova's Advanced Lung Disease services. In November 2008, Inova's Sarcoidosis clinic was designated a World Association of Sarcoidosis and other Granulomatous Disorders (WASOG) clinic. Sarcoidosis accounts for about 8% of our interstitial lung disease population as well as pulmonary hypertension population. Moreover, sarcoidosis is an important indication for lung transplantation at our center. Dr. Shambhu Aryal leads the sarcoidosis clinic. Besides pulmonology, our multidisciplinary team includes representation from cardiology, dermatology, neurology and ophthalmology to ensure comprehensive care to patients with coexisting or isolated non-pulmonary manifestations of sarcoidosis. Dr. Mitchell Pstoka, director of Infiltrative Cardiomyopathy Center is the lead cardiologist for the sarcoid center and Dr. Rahul Dave is our neurologist. We also welcome Dr. Abbas Reza Emaminia to our sarcoid team this year; he is the new director of Advanced Cardiac Imaging at Inova and joins us from Columbia University.

We currently have **three active clinical trials** for patients with pulmonary sarcoidosis. The first is a phase 2 trial of an intravenous neurolipin-2 modulator in a novel steroid –sparing trial model for patients on a background of cell cycle inhibitor or antimetabolite. The second is a dose escalation study to assess the safety and efficacy of pulsed inhaled nitric oxide in subjects with pulmonary fibrosis or sarcoidosis. The third is the registry of sarcoidosis of sarcoidosis associated pulmonary hypertension. Besides the benefit of the clinical trials, our patients with sarcoidosis also get to be assessed for the need for lung transplantation early on due to the availability of lung transplantation services at our program. If you have patients you wish to consider for these trials or for lung transplantation, please contact Dr. Shambhu Aryal at shambhu.aryal@inova.org or at 703-76-5427.

Advanced Lung Disease & Lung Transplantation Critical Care (by Chris King, MD)

The Inova team continues to increase its capacity to care for the sickest, most complex patients. We have a robust cardiogenic shock program and can provide comprehensive care for all variety of pulmonary conditions. We are a high volume ECMO center **with over 100 runs in 2019**. Our comparative outcome data via the International ELSO registry is superior to the average in comparison centers with similar patient volumes. Referral for ECMO consideration can be initiated via the Cardio Access center at 703-776-5905.

We have also extended our commitment to clinical research in the critical care/ ECMO arena. Our clinic to assess functional and psychological outcomes in ECMO survivors, a needed endeavor which is rarely available in most ECMO centers, is underway and will provide valuable information regarding short and long term function of these patients. Clinical research on methods to optimize anticoagulation monitoring, neuroprognostication and reduction in bleeding and thrombotic complications also continues.

Finally, we are a clinical trial site for the VENT-AVOID trial https://clinicaltrials.gov/ct2/show/NCT03255057) evaluating the A-LUNG machine in patients with COPD exacerbations. Patients failing non-invasive ventilation or failing to liberate from mechanical ventilation are eligible. This device is analogous to "lung dialysis", clearing CO_2 through a low flow machine and a small venous cannula that can be placed at the bedside . If you have patients you wish to be considered for this trial please contact Dr. Christopher King at 703-953-7837.

Research

The Advanced Lung Disease Research Program was established in 1996 and has grown exponentially since then. Our site participates in numerous clinical trials for a variety of lung diseases including interstitial lung disease, lung transplantation, pulmonary hypertension, chronic obstructive pulmonary disease including A1AT deficiency, and non-CF bronchiectasis. This includes industry sponsored clinical trials, Inova investigator initiated studies, biobanking and research collaborations.

The research program's infrastructure includes:

- 4 research nurses
- 4 clinical research coordinators (CRCs)
- 1 research assistant
- 1 regulatory coordinator

Extensive experience with recruitment strategies in pulmonary trials as well as the tight integration of our clinical and research teams promotes a seamless transition between these pillars of our comprehensive program. Every patient who is seen in our clinic is screened for available clinical trials on a daily basis by our research assistant. Our physicians personally discuss the importance and merits of clinical trial involvement, which raises patients' comfort and interest in participating. Our team's willingness to collaborate with sponsors and other institutions has led to exciting and novel studies.

Our research team has monthly research team meetings to address upcoming trials, track enrollment in current trials and troubleshoot barriers to enrollment. In addition, the research team has dedicated weekly meeting times with the PI of all studies to review recruitment goals and progress of the study.

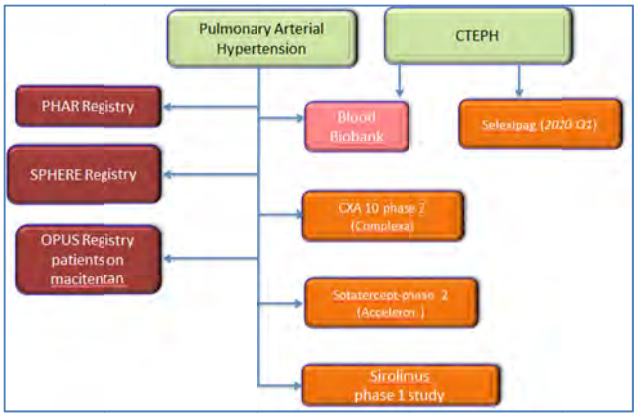
Our hospital is also home to a Clinical Trials Unit where most of our research patients are seen. The unit has two pulmonary function test rooms and a six-minute walk hallway, which allows the unit to serve as a one-stop shop for the majority of our research procedures. This unit can accommodate complex studies to include phase 1 trials, as well as overnight stays and multiple pharmacokinetic time points.

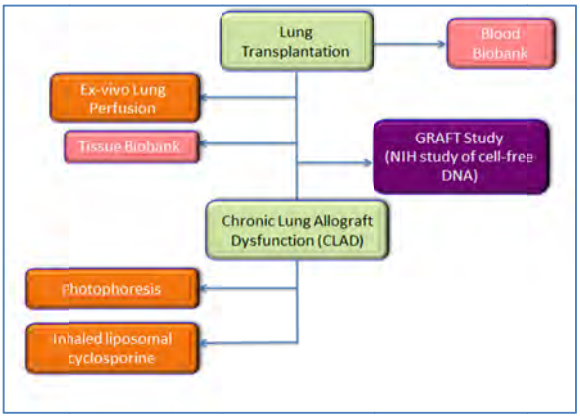
We feel that the ability of patients to participate in clinical trials is empowering as it provides patients an avenue to "fight back" against their diseases. Research affords patients the opportunity to, not only benefit from the medical literature, but also to contribute to the literature so that other patients might benefit.

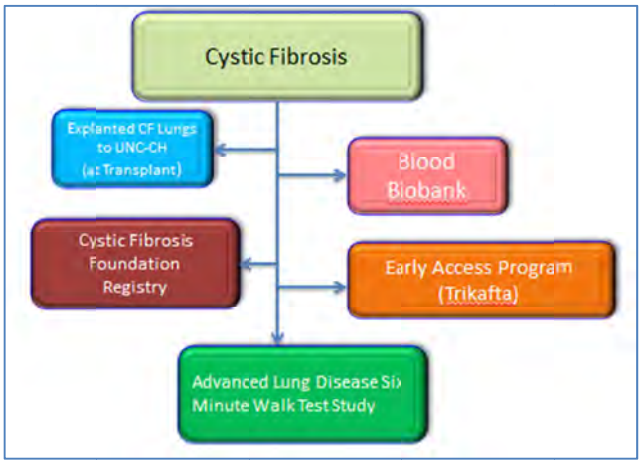
Currently Available Research Studies
For all inquiries please email:
lungresearch@inova.org
or email one of our docs (page 4) ☺

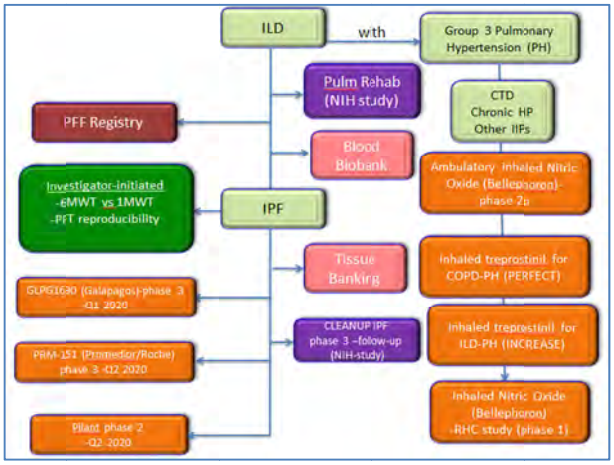
Clinical Trial algorithms for ALD &LTx

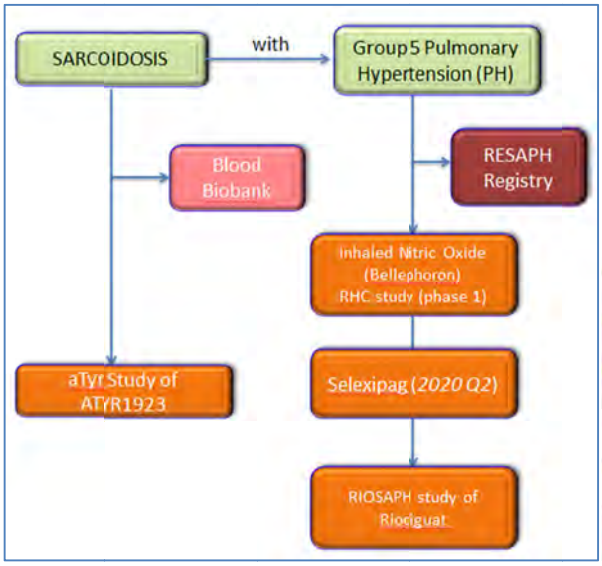
With apologies for the busy slides ☺ The bottom line message is that we have a broad portfolio of studies for the different disease groups with patients routinely screened for these in the context of their clinic visits.











Academic Accomplishments 2019
(Inova authors bolded)

Original Research Manuscripts (accepted or published)

1. Woolstenhulme JG, Guccione AA, Herrick JE, Collins JP, **Nathan SD**, Chan LE, Keyser RE. Left Ventricular Function Before and After Aerobic Exercise Training in Women Who Have Pulmonary Arterial Hypertension. J Cardiopulm Rehabil Prev. 2019 Mar;39(2):118-126.
2. Rhodes C et al. (**Nathan SD** among 118 co-authors). Genetic determinants of risk and survival in pulmonary arterial hypertension. Lancet Res Med 2019;7:227-238
3. **Nathan SD**, Costabel U, Glaspole I, Glassberg MK, Lancaster LH, Lederer DJ, Pereira CA, Trzaskoma B, Morgenthien E, Limb SL, Wells AU. Incidence of Multiple Progression Events: Pooled Analysis of Patients With Idiopathic Pulmonary Fibrosis Treated With Pirfenidone. Chest 2019; 155(4):712-719
4. Raghu G, Flaherty KR, Lederer DJ, Lynch DA, Colby TV, Myers JL, Groshong SD, Larsen BT, Chung JH, Steele MP, Benzaquen S, Calero K, Case A, Criner G, Guerrero J, **Nathan SD**, Rai N, Ramaswamy M, Hagmeyer L, Davis JR, Gauhar U, Pankratz DG, Choi Y, Huang J, Walsh PS, Neville H, Lofaro LR, Barth NM, Kennedy GC, Brown KK, Martinez FJ. Diagnostic accuracy of conventional transbronchial biopsies through the use of a molecular classifier for usual interstitial pneumonia pattern. Lancet Res Med 2019;7:487-496
5. Agbor-Enoh S, Wang Y, Tunc I, Davis A, Jang MK, De Vlaminck I, Shah PD, Timofte I, **Brown AW**, Marihsta A, Bhatti K, Gorham S, Wylie J, Goodwin N, Yang Y, Patel K, Fideli U, Luikart H, Zhu J, Iacono A, Orens J, **Nathan SD**, Marboe C, Berry GJ, Quake SR, Khush K, Valantine HA. Trends of early allograft injury measured via donor-derived cell-free DNA and poor outcomes after lung transplantation. EBioMedicine.2019;40:541-553
6. Raghu G, van den Blink B, Hamblin MJ, **Brown AW,** Golden JA, Ho LA, Wijsenbeek MS, Vasakova M, Pesci A, Antin-Ozerkis DE, Meyer KC, Kreuter M, Moran D, Santin-Janin H, Aubin F, Mulder GJ, Gupta R, Richeldi L. Long-term treatment with recombinant human pentraxin 2 protein in patients with idiopathic pulmonary fibrosis: an open-label extension study. Lancet Respir Med. 2019 May 17. pii: S2213-2600(19)30172-9. doi: 10.1016/S2213-2600(19)30172-9. [Epub ahead of print]
7. **Nathan SD**, Costabel U, Albera C, Behr J, Wuyts W, Kirchgaessler KU, Stauffer J, Morgenthien E, Chou W, Noble PW. Efficacy and safety of pirfenidone for the treatment of patients with idiopathic pulmonary fibrosis and severe lung function impairment. Respir Med. 2019;153: 44-51
8. Moore C, Blumhagen RZ,Yang IV, Walts A, Powers J, Walker T, Bishop M, Russell P, Vestal B, Cardwell J, Markin CR, Mathai SK, Schwarz MI, Steele MP, Lee J, Brown KK, Loyd JE, Lynch D, Crapo JD, Silverman EK, Cho MH, James JA,. Guthridge JM, Cogan JD, Kropski JA, Swigris JJ, Bair C, Kim DS, Ji W, Kim H, Song JW, Maier LA, Pacheco KA, Hirani N, Poon AS, Li F, Jenkins RG, Braybrooke R, Saini G, Maher TM, Molyneaux PL,Saunders P, Zhang Y, Gibson KF, Kass DJ, Rojas M, Sembrat J, Wolters PJ, Collard HR, Sundy JS, O'Riordan T, Strek ME, Noth I, Ma S, Porteous MK, Kreider ME, Patel NB, Inoue Y, Hirose M, Arai T, Akagawa S, Eickelberg O, Fernandez IE, Behr J, Mogulkoc N, Corte TJ, Glaspole I, Tomassetti S, Ravaglia C, Poletti V, Crestani B, Borie R, Kannengiesser C, Parfrey H, Fiddler C, Rassl D, Molina-Molina M, Machahua C, Worboys AM, Gudmundsson G, Isaksson HJ, Lederer DL, Podolanczuk AJ, Montesi SB, Bendstrup E, Danchel V, Selman M, Pardo A, Henry MT, Keane MP, Doran P, Vašáková M, Sterclova M, Ryerson CJ, Wilcox PG, Okamoto T, Furusawa H, Miyazaki Y, Laurent G, Baltic S, Prele C, Moodley Y, Shea BS, Ohta K, Suzukawa M, Narumoto O, **Nathan SD, Venuto DC, Woldehanna ML**, Kokturk N, de Andrade JA, Luckhardt T, Kulkarni T, Bonella F, Donnelly SC, McElroy A, Armstong ME, Aranda A, Carbone RG, Puppo F, Beckman KB, Nickerson DA, Fingerlin TE, Schwartz DA. Resequencing Study Confirms Host Defense and Cell Senescence Gene Variants Contribute to the Risk of Idiopathic Pulmonary Fibrosis. Am J Respir Crit Care Med 2019;200:199-208
9. Raghu G, van den Blink B, Hamblin MJ, **Brown AW**, Golden JA, Ho LA, Wijsenbeek MS, Vasakova M, Pesci A, Antin-Ozerkis DE, Meyer KC, Kreuter M, Moran D, Santin-Janin H, Aubin F, Mulder GJ, Gupta R, Richeldi L. Long-term treatment with recombinant human pentraxin 2 protein in patients with idiopathic pulmonary fibrosis: an open-label extension study. Lancet Respir Med. 2019 May 17. pii: S2213-2600(19)30172-9. doi: 10.1016/S2213-2600(19)30172-9.
10. Rodriguez L, Bui S, Beuschel R, Ellis E, Liberti E, Chhina M, Cannon B, Lemma M, **Nathan S**, Grant G. Curcumin Induced Oxidative Stress Attenuation by N-acetylcysteine Cotreatment: A Fibroblast and Epithelial Cell in-vitro Study in Idiopathic Pulmonary Fibrosis. Accepted to Molecular Medicine 5/25/2019
11. Ratwani A, **Ahmad KI**, **Barnett SD, Nathan SD, Brown AW**. Connective Tissue Disease Associated Interstitial Lung Disease and Outcomes After Hospitalization: A Cohort Study. Respir Med. 2019 Jun 4;154:1-5. doi: 10.1016/j.rmed.2019.05.020.

12. **Steven D Nathan,** Juergen Behr, Harold R Collard, Vincent Cottin, Marius M Hoeper, Fernando Martinez, Tamera Corte, Anne Keogh, Hanno Leuchte, Nesrin Mogulkoc, Silvia Ulrich, Wim Wuyts, Sukrut Shah, Mia Yao, Francis Boateng, Athol Wells Riociguat in Patients with Idiopathic Interstitial Pneumonia Associated with Pulmonary Hypertension: The RISE-IIP Study. Lancet Res Med 2019;7:780-790
13. Sonti R, Gersten RA, **Barnett SD, Brown AW, Nathan SD.** Multimodal Noninvasive Prediction of Pulmonary Hypertension in IPF. Clin Respir J. 2019;00:1–7.
14. Glassberg MK, **Nathan SD**, Lin C, Lew C, Morgenthien E, Day B, Stauffer J, Chou W, Noble PW. Cardiovascular and Bleeding Risk Factors and Events in Patients With Idiopathic Pulmonary Fibrosis From 3 Phase III Trials of Pirfenidone. Adv Ther. 2019 Sep 9. doi: 10.1007/s12325-019-01082-6 epbub ahead of print
15. **Aryal S, Katugaha S, Cochrane A, Brown AW, Shlobin OS, Ahmad K, Nathan SD, Marinak L, Desai S, King C.** Single Center Experience with Use of Letermovir for CMV Prophylaxis or Treatment in Thoracic Organ Transplant Recipients. Transpl Infect Dis. 2019 Sep 5. doi: 10.1111/tid.13166. [Epub ahead of print]

Reviews

1. Benza R, Raina A, Kanwar MK, **Nathan SD**, Mathai SC. sGC stimulators: evidence in pulmonary hypertension and beyond. Accepted to the Journal of Rare Diseases Research and Treatment 11/2/17.
2. **King CS, Brown AW, Aryal S, Ahmad K,** Donaldson S. Critical Care of the Adult Cystic Fibrosis Patient. Chest. 2018; pii: S0012-3692(18)31123-1. doi: 10.1016/j.chest.2018.07.025. [Epub ahead of print].
3. **King CS, Shlobin OA.** Ask the Expert: Thyroid Disease in PAH. Advances in Pulm HTN. Accepted
4. **King CS, Nathan SD.** Pulmonary Hypertension Due to Interstitial Lung Disease. King CS, Nathan SD. Pulmonary Hypertension Due to Interstitial Lung Disease. Curr Opin Pulm Med. 2019;25:459-467
5. **Aryal S, Nathan SD**. Contemporary Optimized Practice in the Management of Pulmonary Sarcoidosis. Ther Adv Respir Dis 2019;13:1753466619868935
6. Ratwani A, Gupta B, Stephenson BW, Mani H, **Brown AW.** The Spectrum of Drug-Induced Interstitial Lung Disease. Submitted to Current Pulmonology Reports, July 2019 (under review)
7. Lancaster L, Fieuw A, Meulemans J, Ford P, **Nathan SD**. Standardization of the 6-minute walk test in idiopathic pulmonary fibrosis. To be submitted

Editorials

1. **Nathan SD**. Nintedanib and sildenafil in patients with idiopathic pulmonary fibrosis: echoes of the past, lessons for the future Am J Respir Crit Care Med. 2019 Aug 19. doi: 10.1164/rccm.201908-1510ED. [Epub ahead of print]
2. **Nathan SD.** Should every patient with IPF be referred for transplant evaluation? Yes Point/Counterpoint. Accepted to Chest Dec 18th, 2019

Letters

1. Raghu G, Colby T, Myers J, Steele M, Benzaquen, Sadia ; Calero, Karel; Case, Amy; Criner, Gerard; **Nathan, Steven**; Rai, Navdeep; Hagmeyer, Lars; Davis, John; Bhorade, Sangeeta; kennedy, giulia; Gauhar, Umair; Martinez F. A molecular classifier that identifies usual interstitial pneumonia in transbronchial biopsies of patients with ILD. Accepted to Chest 10/4/2019

Consensus Statements

1. Wells AU, Poletti V, Behr J, Cassidy N, Costable U, Cottin V, Hansell DM, Masefield SC, Richeldi L, Ross D, Ancochea J, Antoniou KM< Bajwah S, Bouros D, Brown KK, Collard HR, Corte TJ, Crestani B, Dai H, Drent M, Egan JJ, Fell CD, Fischer A, Flaherty KR, Grutters JC, Hirani N, Inoue Y, Maher TM, Muller-Quernheim J, **Nathan SD**, Noble PW, Powell P, Robalo-Cordeiro C, Ryerson CJ, Ryu JH, Saltini C, Selman M, Sverzellati N, Taniguchi H, Undurraga A, Valeyre D, Vancheri C, Wuyts W, Xaubet A.Diagnosis and management of idiopathic pulmonary fibrosis - a combined physician and patient European Respiratory Society and European Lung Foundation consensus statement. Accepted Eur Res J May 14th, 2018
2. **Nathan SD**, Barbera JA, Gaine SP, Harari S, Martinez FJ, Olschewski H, Olsson KM, Peacock AJ, Pepke-Zaba J, Provencher S, Weissmann N, Seeger W. Pulmonary Hypertension in Chronic Lung Disease. Eur Respir J 2019; 53: 1801914 doi: 10.1183/13993003.01914-2018

Book Chapters and Books

1. **Aryal S, Ahmad K, Nathan SD.** Group 3 PH: Clinical Features and Treatment: For Encyclopedia of Respiratory Medicine, 2nd Editior Medicine being published by Elsevier.
2. **King CS, Aryal S, Nathan SD**. Idiopathic Pulmonary Fibrosis: Phenotypes and Comorbidities for Idiopathic Pulmonary Fibrosis-2nd edition (edited by Meyer and **Nathan**).
3. Idiopathic Pulmonary Fibrosis.(2nd edition) Edited by Keith Meyer, MD and **Steven Nathan, MD.** Published by Springer January 3rd, 2019. https://www.springer.com/us/book/9783319999746

Case Reports

1. **Mabe D, Shlobin OA, Bogar, L, Nathan SD, Brown AW, Ahmad K, Aryal S, Murphy C, King CS.** ECMO as a Bridge to Initial Medical Therapy in a Patient with Decompensated Pulmonary Arterial Hypertension. Journal of Medical Cases. 2019. (in-press)
2. **Koslow M**, Bennji SM, Griffiths-Richards S, **Ahmad K**, Johnson GB, Ryu JH, **Nathan SD**, Allwood BW. The Mayo Clinic Rheumatoid Lung Nodule Score is Tested in South Africa: Lessons from a Telemedicine Trans-Atlantic Multi-Disciplinary Discussion. **Accepted to Chest 10/26/2019**
3. Burn Pits-Associated, Long-term Iraq/Afghanistan War Lung Injury (IAW-LI). Submitted to Mayo Clinic Proceedings.

ORIGINAL RESEARCH ABSTRACTS & PRESENTATIONS TO INTERNATIONAL MEETINGS

International Society for Heart and Lung Transplantation (Orlando April 2019)

1. **King, C; Aryal, S; Cochrane, A; Brown, AW; Shlobin, OA; Ahmad, K; Nathan, SD; Marinak, L; Fregoso, M; Chun, J; Shah, P; Desai, S; Katugaha,S.** Single Center Experience with Use of Letermovir for CMV Prophylaxis or Treatment in Thoracic Organ Transplant Recipients. Accepted to ISHLT 2019 (12/18/18) as oral presentation
2. **Kim MK, Brown AW, Shlobin OA, King C, Aryal S, Ahmad K, Cochrane A, Marinak L, Katugaha SB.** Cryptococcus laurentii Hip Infection after Lung Transplant. Junior Faculty Clinical Case Reports Accepted to ISHLT 2019 (12/18/18)
3. **Brown AW, Fregoso M, Peterson J, Nayyar M, Cochrane A, Aryal A, Shlobin O, Pluhacek J, Lemma M, King C, Ramaswamy IK, Deeken JF, Nathan SD.** The Impact of Pharmacogenomics on Tacrolimus Doing and Levels Among Lung Transplant Recipients. Accepted to ISHLT 2019 (12/18/18)
4. **Ahmad K, Shlobin OA, Aryal S, Nathan SD, King C, Brown AW, Katugaha** S. Donor-Derived *Strongyloides* Hyperinfection Syndrome in a Lung Transplant Recipient. Junior Faculty Clinical Case Reports. Accepted to ISHLT 2019 (12/18/18)
5. **Dhonti N, Della-Santina J, Bogar L, Mani H, Aryal S**. Constrictive pericarditis after lung transplantation.
6. Inflammatory Events Precede Development of *De Novo* DSA after Lung Transplantation.
7. Kolaitis NA, Zamanian RT, de Jesus Perez VA, Badesch DB, Benza RL, Burger CD, Chakinala MM, Feldman J, Lammi MR, Mathai SC, Presberg KW, Robinson JC, Sager JS, **Shlobin OA**, Simon MA, Kawut SM, Singer JP, De Marco T. Demographic, Hemodynamic, and HRQL Differences between Methamphetamine-Associated and Idiopathic PAH: The Pulmonary Hypertension Association Registry (mini-oral presentation)

ATS 2019

1. **Brown AW; Peterson J; Cheng J; Nunes Soares FS, MD; Aryal S, Ahmad K, Koslow M, Weir N, Shlobin OA, King C, Nathan SD.** Serial Change in the White Blood Cell Count as a Prognostic Indicator in Idiopathic Pulmonary Fibrosis. Submitted to ATS 2019.
2. Huitema MP, Grutters JC, Post MC, Kouranos V, **Shlobin OA, Nathan S,** Wells A, Culver D, Barney J, Gupta R, Carmona E, Alhamad EH, Scholand MB, Wijsenbeek M, Ganesh S, Lower EE, Engel PJ, Baughman RP. Impact of parenchymal lung disease in echocardiographic estimate of pulmonary artery pressure in sarcoidosis patients. ATS 2019
3. **Nathan SD**, Yang M, Morgenthien EA, Stauffer JL. Forced Vital Capacity in Patients With Idiopathic Pulmonary Fibrosis: Visit-to-Visit Variability and the Role of 6-Minute Walk Distance to Validate Changes. ATS 2019
4. Johannson KA, Noth E, Collard HR, Ley B, Thakur N, **Nathan SD**. Social and Environmental Determinants of Lung Function in Patients with Idiopathic Pulmonary Fibrosis. ATS 2019
5. **Brown AW, Peterson J, Cheng J, Cannon B, King CK, Nathan SD.** White Blood Cell Count and Hospitalization as Additive Prognostic Indicators in Idiopathic Pulmonary Fibrosis. ATS 2019
6. **Stephenson BW, Swierzbinksi M, Ahmad K, Shlobin OA, Brown AW, Aryal S, Koslow M, King CS**. Filgrastim-Induced Acute Respiratory Distress Syndrome. ATS 2019 (poster)

7. **King C,** Freiheit, E, **Brown AW, Venuto D,** Flaherty K, **Nathan SD**. Effects of Anticoagulation on Survival in Interstitial Lung Disease: An Analysis of the Pulmonary Fibrosis Foundation (PFF) Registry. ATS 2019 (oral presentation)
8. **Podder S, Rahim H, Verster A, Shlobin O, King C, Brown AW, Nathan SD.** Complete Blood Count Parameters as Predictor of Outcomes in Patients with Pulmonary Arterial Hypertension. ATS 2019
9. DesJardin JT, Kolaitis NA, Kime N, Kronmal R, Bartolome S, Benza R, Elwing J, Feldman J, Fineman J, Grinnan D, Horn E, Lammi MR, McConnell JW, Presberg K, Sager J, **Shlobin O**, Simon M, Thenappan T, De Marco T; PHAR Investigators. Increasing age is associated with worsening physical function despite more favorable cardiopulmonary hemodynamics: A Pulmonary Hypertension Association Registry (PHAR) report (accepted)
10. MP Huitema, JC Grutters, MC Post, Vaslis Kouranos, **OA Shlobin, S Nathan**, A Wells, DA Culver, J Barney, R Gupta, E Carmona, EH Alhamad, M Scholand, M Wijsenbeek , S Ganesh, EE Lower, PJ Engel, RP Baughman. Impact of parenchymal lung disease in echocardiographic estimate of pulmonary artery pressure in sarcoidosis patients.
11. Archer-Chicko C, Al-Naamani N, Benza R, Feldman J, Berman Rosenzweig E, Horn E, Sager J, Presberg K, **Shlobin O**, Mathai S, McConnell JW, Burger C, Frantz R, Klinger J, Ventutuolo C, Eggert M, Zamanian R, Robinson J, Lammi M, Demarco T, Allen R, Elwing JM, Bull T, Badesch D, Williamson T, Ramani G, Thenappan T, Ford HJ, White JM, Runo J, Simon M, Bartolome S, Hemnes A, Grinnan D, Chakinala M, Kawut SM. Nurse staffing and the quality of life and outcomes of patients with pulmonary arterial hypertension: The Pulmonary Hypertension Association Registry (accepted).
12. Behr J, **Nathan SD,** Harari S, Wuyts W, Mogulkoç, Bishop N, Borous D, Antoniou K, Guiot J, Kramer M, Kirchgaessler KU, Bengus M, Gilberg F, Wells AU. Baseline Characteristics of All Patients Randomized in a Phase IIb Trial of Sildenafil Added to Pirfenidone in Patients With Advanced Idiopathic Pulmonary Fibrosis and Risk of Pulmonary Hypertension. ATS 2019
13. Raghu G, van den Blink B, Hamblin MJ, **Brown AW**, Golden JA, Ho LA, Wijsenbeek MS, Vasakova M, Pesci A, Antin-Ozerkis DE, Meyer K, Kreuter M, Santin-Janin H, Aubin F, Mulder GH, Gupta R, Richeldi L. Long-term Safety and Efficacy of Recombinant Human Pentraxin-2 in Patients with Idiopathic Pulmonary Fibrosis. ATS 2019.
14. Savale L, Humbert M, Wells AU, **Nathan SD**, Gupta R, Huitema MP, Jaïs X, Grutters JC, Kouranos V, Montani D, **Shlobin OA**, Sitbon O, Baughman R. Algorithm for pulmonary hypertension screening in sarcoidosis: A Delphi Consensus. ATS 2019.
15. **McLaughlin J, Aryal S.** Leucocytoclastic vasculitis due to azathioprine. ATS 2019 (poster)
16. **Tora I, Ahmad K, Brown AW, Koslow M, Aryal S.** IPF associated with extremely elevated IgE levels. ATS 2019 (poster)
17. **McMahan M, Aryal S, Nathan SD.** Pulmonary hypertension in a patient with pyruvate Kinase deficiency treated with riociguat. ATS 2019 (poster)
18. Jacqueline T. DesJardin, MD; Nicholas A. Kolaitis, MD; Noah Kime, BS; Richard Kronmal, PhD; Sonja Bartolome, MD; Raymond Benza, MD; Jean Elwing, MD; Jeremy Feldman, MD; Jeff Fineman, MD; Daniel Grinnan, MD; Evelyn Horn, MD; Matthew R. Lammi, MD; John Wesley McConnell, MD; Kenneth Presberg, MD; Jeffrey Sager, MD; **Oksana Shlobin, MD**; Marc Simon, MD, MS; Thenappan Thenappan, MD; Teresa De Marco, MD; PHAR Investigators. Age-Related Differences in Baseline Hemodynamics and Functional Assessments Among Patients in the Pulmonary Hypertension Association Registry.
19. **S.D. Nathan,** K. Flaherty, M. K. Glassberg, G. Raghu, J. Swigris, R. Alvarez, N. Ettinger, J. Loyd, P. Fernandes, H. Gillies, P. Shah, L. Lancaster.A Randomized, double-blind, placebo-controlled study to assess the safety and efficacy of pulsed, inhaled nitric oxide (iNO) at a dose of 30 mcg/kg-IBW/hr (iNO 30) in subjects at risk of Pulmonary Hypertension associated with Pulmonary Fibrosis (PH-PF) on Long Term Oxygen Therapy. Podium presentation ATS May 20th, 2019.
20. Min J, Benza RL, Feldman JP, Rosenzweig EB, Horn E, Sager JS, Presberg KW, **Shlobin OA,** Mathai SC, McConnell JW, Burger CD, Frantz RP, Klinger JR, Ventetuolo CE, Eggert M, Zamanian RT, Robinson J, Lammi MR, De Marco T, Allen R, Elwing JM, Bull TM, Badesch DB, Williamson TL, Ramani G, Thenappan,T , Ford HJ, White R, Runo JR, Simon M, Bartolome S, Hemnes A, Grinnan D, Chakinala MM, Kawut SM, Al-Naamani N. Obesity and Quality of Life in Pulmonary Arterial Hypertension (PAH): The Pulmonary Hypertension Association Registry (PHAR). American Thoracic Society International Conference, May 2019
21. Huitema MP, Grutters JC, Post MC, Kouranos V, **Shlobin OA, Nathan S**, Wells A, Culver D, Barney J, Gupta R, Carmona E, Alhamad EH, Scholand MB, Wijsenbeek M, Ganesh S, Lower EE, Engel PJ, Baughman RP. Impact of parenchymal lung disease in echocardiographic estimate of pulmonary artery pressure in sarcoidosis patients (ReSAPH).
22. Rossiello M, Szema AM, **Venuto D, Nathan SD**, Nicholas S, Glotch T, Thieme J. Titanium Lung in a Soldier with Iraq/Afghanistan War-Lung Injury. ATS 2019
23. Huang P, Szema A, **Venuto D, Nathan S**, Nicholas S, Glotch T, Thieme J. ATS 2019Titanium is abundant in Fibrotic Lungs of Two Soldiers Post-Deployment to Iraq and Afghanistan but is not seen in Lungs of Five patients with IPF. ATS 2019

PVRI meeting Barcelona, Feb 2019

1. **S.D. Nathan**, R. Alvarez, N. Ettinger, P. Fernandes, K. Flaherty, H. Gillies, M. Glassberg Ceste, L. Lancaster, J. Loyd, G. Raghu, P. Shah, J. Swigris. Actigraphy as a clinically meaningful endpoint to detect change after treatment with iNO (30 mcg/kg/hr) in patients with Pulmonary Hypertension associated with Pulmonary Fibrosis. Accepted to PVRI meeting Barcelona 2019.

ECFS Meeting 2019

1. Taylor-Cousar JL, Jain R, **Brown AW**. Continuation of dual combination CFTR modulators during pregnancy in women with CF.

NACFC October 2019

1. **Venuto DC,** Warden JL Jr, Ho D, **Bowen M,** Azad-Frouz N, Le Q, **King CS,** Schmidt ME, Stevenson L, **Brown, AW.** Initial Pilot Results of a Novel Point of Care, Rapid Test Detecting Pseudomonas aeruginosa in Cystic Fibrosis Patients. Accepted to NACFC 2019.
2. **Bowen M,** Duong Q, Russell C, Connors G, Kopelen R, Palczynski K, **King C, Brown AW.** Outcomes and Impact of a CF Specific Pulmonary Rehabilitation Program. Accepted to NACFC 2019.

European Respiratory Society meeting Madrid September 2019.

1. Swigris, J, **Nathan SD,** Tighe R, Anandarangam T., Nagra S., Rabe C, Kelkoff D, Switzer T, Kolatkar N, Belloni P, Golden J. STARMAP: An Observational Study to Assess Disease-Relevant Outcomes Using Home Monitoring Devices In Patients With IPF. Presented at ERS Madrid, Sep 2019.

American College of Chest Physicians meeting 2019

1. **Inga Ksovreli; Scott D. Barnett; Oksana A. Shlobin; Christopher S. King; Steven D.Nathan.** Categorization of Group 3 Pulmonary Hypertension by the 2018 definition: Who is in, who is out? Submitted to Chest 2019.
2. Talha Demirci, MD; **Scott D. Barnett, PhD; A. Whitney Brown, MD; Christopher King, MD; Steven D. Nathan, MD.** White Blood Cell Count as a Prognostic Indicator in the Treatment of Idiopathic Pulmonary Fibrosis. Submitted to Chest 2019
3. **Matthew Koslow, M.D.1, Sandeep Khandhar, M.D.2, Haresh Mani, M.D.3, Steven Nathan, M.D.1, Shambhu Aryal, M.D.**1A Curious case of Cavities in the Lung. Submitted to Chest 2019
4. Sadia Benzaquen, David A. Lynch, Jonathan H. Chung, Kevin R. Flaherty, Thomas V. Colby, Jeffrey L. Myers, Steve D. Groshong, Brandon T. Larsen, Mark P. Steele, Karel Calero, Amy H. Case, Gerard J. Criner, **Steven D. Nathan**, Navdeep S. Rai, Murali Ramaswamy, Lars Hagmeyer, J. Russell Davis, Umair A. Gauhar, Neil M. Barth, Daniel G. Pankratz, Yoonha Choi, Jing Huang, P. Sean Walsh, Hannah Neville, Lori R. Lofaro, Giulia C. Kennedy, Kevin K. Brown, Ganesh Raghu, and Fernando J. Martinez. Combing Radiology and Envisia, a Molecular Classifier, to improve UIP Diagnosis. Submitted to Chest 2019
5. Jonathan H. Chung, David A. Lynch, David J. Lederer, Kevin R. Flaherty, Thomas V. Colby, Jeffrey L. Myers, Steve D. Groshong, Brandon T. Larsen, Mark P. Steele, Sadia Benzaquen, Karel Calero, Amy H. Case, Gerard J. Criner, **Steven D. Nathan**, Navdeep S. Rai, Murali Ramaswamy, Lars Hagmeyer, J. Russell Davis, Umair A. Gauhar, Neil M. Barth, Daniel G. Pankratz, Yoonha Choi, Jing Huang, P. Sean Walsh, Hannah Neville, Lori R. Lofaro, Giulia C. Kennedy, Kevin K. Brown, Ganesh Raghu, and Fernando J. Martinez. Evaluating Clinical Utility of a UIP genomic Classifier in subjects with and without a HRCT pattern of UIP. Submitted to Chest 2019
6. **S.D. Nathan**, K. Flaherty, G. Raghu, J. Swigris, R. Alvarez, N. Ettinger, J. Loyd, P. Fernandes, H. Gillies, P. Shah, L. Lancaster , M. K. Glassberg. Open label dose escalation data from the randomized, double-blind, placebo-controlled study to assess the safety and efficacy of pulsed, inhaled nitric oxide (iNO) in subjects at risk of Pulmonary Hypertension associated with Pulmonary Fibrosis (PH-PF) on Long Term Oxygen Therapy. Accepted to Chest as a later breaker.
7. Bhatnagar A, Gupta P, Singh P, **Mani H, Ahmad K, Aryal S**. "A Case of CADM related ILD due to anti-MDA-5 antibody and Hepatitis B infection" Accepted for October 2019. Oral Presentation at Chest Annual Meeting. New Orleans, LA.

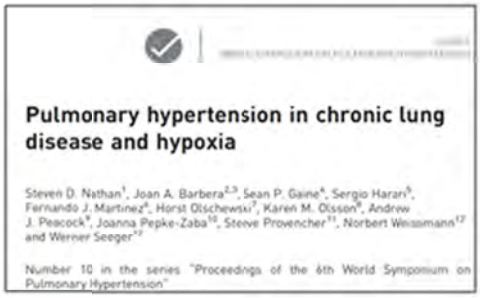
Transplant Nursing Symposium, November 2019

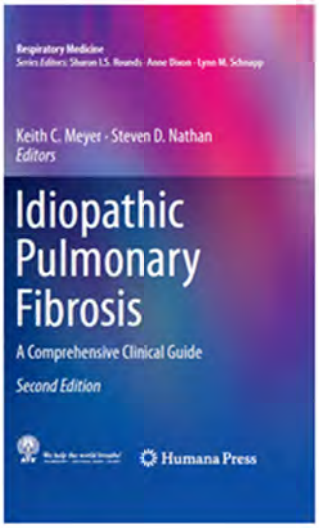
1. **Fregoso, M, Nathan SD.** Perception versus reality in medication adherence. Submitted to the International Transplant Nurses Society (ITNS)

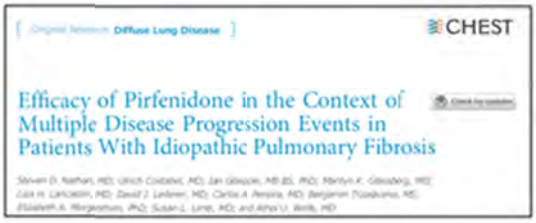
Pulmonary Fibrosis Foundation meeting (San Antonio November 2019)

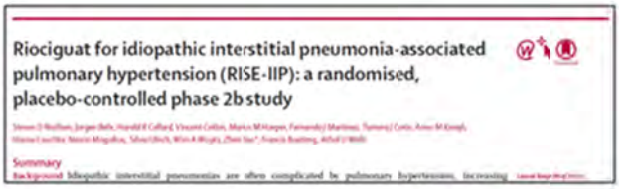
1. Bhorade S, Case A, Calero K, Criner G, **Nathan SD**, Rai NS, Ramaswamy M, Hagmeyer L, Davis JR, Gauh AU. Combining the Envisia Genomic Classifier with high-resolution computed tomography (HRCT) improves the diagnosis of usual interstitial pneumonia (UIP). Accepted to the Pulmonary Fibrosis Foundation conference.
2. L. Lancaster, K. Flaherty, M. K. Glassberg, G. Raghu, J. Swigris, R. Alvarez, N. Ettinger, J. Loyd, P. Fernandes, H. Gillies, P. Shah , **S.D. Nathan**. Actigraphy as a clinically meaningful endpoint to detect change after treatment with inhaled NO (30mcg/kg-IBW/hr) in patients at risk of Pulmonary Hypertension associated with Pulmonary Fibrosis. Accepted to the Pulmonary Fibrosis Foundation conference.
3. **S.D. Nathan**, K. Flaherty, M. K. Glassberg, G. Raghu, J. Swigris, R. Alvarez, N. Ettinger, J. Loyd, P. Fernandes, H. Gillies, P. Shah, L. Lancaster7A Subgroup analysis from the randomized, double-blind, placebo-controlled study of inhaled nitric oxide (iNO) in subjects at risk of Pulmonary Hypertension associated with Pulmonary Fibrosis (PH-PF) on Long Term Oxygen Therapy. Accepted to the Pulmonary Fibrosis Foundation conference.
2. Jeffrey J. Swigris, **Steven D. Nathan**, Robert Tighe, Sunny Nagra, Christina Rabe, Douglas Kelkhoff, Thomas Switzer, Nikheel Kolatkar, Paula Bellon, Jeffrey Golden. STARMAP: an observational study to assess disease-relevant outcomes using home-monitoring devices in patients with idiopathic pulmonary fibrosis (IPF). Accepted to the Pulmonary Fibrosis Foundation conference.
3. **Pastre J ; Taylor J; Ksovreli I, King C, Nathan SD**. Functional impairment of IPF patients with severe physiologic deficits. Accepted to the Pulmonary Fibrosis Foundation conference.

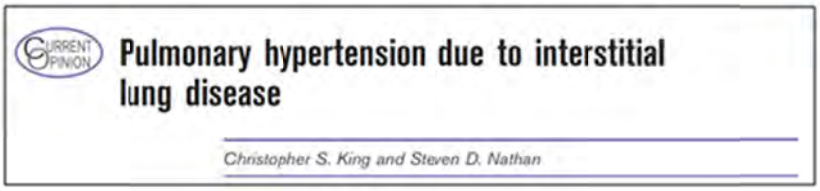
In the spirit of no space wasted!

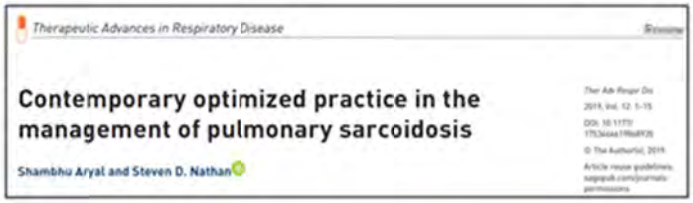












Patient Education & Support Groups

Transplantation. We hold a monthly transplant education and support group to which all our pre-transplant and post-transplant patients are welcome. It is an expectation that our listed patients attend this as it also functions as an education forum with specific topics and speakers on a monthly basis.

IPF. The Pulmonary Fibrosis Support Group of Metropolitan Washington DC is a monthly forum for not only IPF patients, but also those patients with any form of pulmonary fibrosis or interstitial lung disease. Patients do not have to be our clinic patients in order to attend. This support group is now supported by the Pulmonary Fibrosis Foundation and takes place the 4th Tuesday of every month from 1:00-2:30 pm (feel free to bring your lunch and come early at 12:00 to socialize). The group meets at Inova Fairfax Hospital in the physician's conference center, rooms D-E-F. (See flyer below)

Pulmonary Hypertension. We also have a patient run PH support group for all patients with any form of pulmonary hypertension. There are two Pulmonary Hypertension support groups in the area; one in Virginia (NOVA@PHASupportGroups.org) and one in Maryland (MD-SouthernMD@PHASupportGroups.org)

For any information pertaining to our Support Groups, please contact our Social Worker, Susan Perry at **703-776-5776 or susan.perry@inova.org**

Agenda for Education Group
Heart and Lung Transplantation
Ventricular Assist Device, VAD
Inova Fairfax Hospital: Heart and Vascular Institute

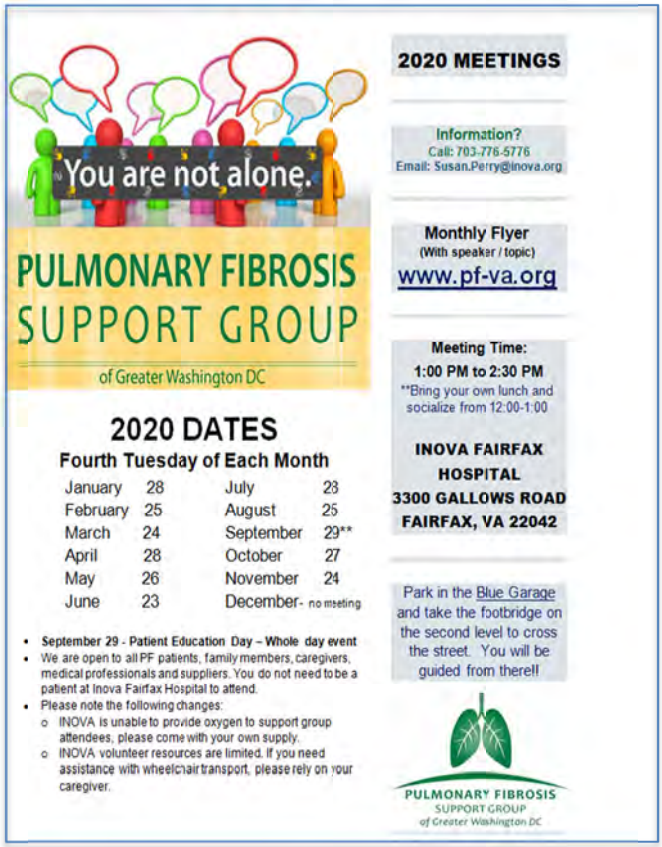
2020

January 7	Pulmonary & Cardiac Rehab	Rehab Staff
February 4	Cardiac Transplant	Shashank Desai, MD
March 3	Lung Transplant	A. Whitney Brown, MD
April 7	Post Transplant Care	ICU/3rd Floor Nurses
May 5	Dermatology	Jennifer DeSimone, MD
June 2	Clinic and Meds	Post Nurse Practitioners
July 7	Life Planning	Social Workers/Palliative Care
August 4	Living With a Transplant	Patient Panel
September 1	Waiting for a Transplant	WRTC Organ Procurement Org.
October 6	Health Insurance Issues	Financial Coordinators
November 3	Nutrition	Transplant Dietitians
December 1	Infectious Disease	Shalika Basnayake Katugaha,MD

First Tuesday of Every Month from 1:00 to 2:00, IHVI Conference Center

****All listed lung candidates need to call (703) 776-8027 if unable to attend**

- All listed lung patients must attend FOUR in person Education Groups within a rolling calendar year to remain listed for lung transplant



PULMONARY FIBROSIS SUPPORT GROUP
of Greater Washington DC

2020 DATES
Fourth Tuesday of Each Month

January	28	July	28
February	25	August	25
March	24	September	29**
April	28	October	27
May	26	November	24
June	23	December-	no meeting

- September 29 - Patient Education Day – Whole day event
- We are open to all PF patients, family members, caregivers, medical professionals and suppliers. You do not need to be a patient at Inova Fairfax Hospital to attend.
- Please note the following changes:
  - INOVA is unable to provide oxygen to support group attendees, please come with your own supply.
  - INOVA volunteer resources are limited. If you need assistance with wheelchair transport, please rely on your caregiver.

2020 MEETINGS

Information?
Call: 703-776-5776
Email: Susan.Perry@inova.org

Monthly Flyer
(With speaker / topic)
www.pf-va.org

Meeting Time:
1:00 PM to 2:30 PM
**Bring your own lunch and socialize from 12:00-1:00

INOVA FAIRFAX HOSPITAL
3300 GALLOWS ROAD
FAIRFAX, VA 22042

Park in the Blue Garage and take the footbridge on the second level to cross the street. You will be guided from there!!

PULMONARY FIBROSIS
SUPPORT GROUP
of Greater Washington DC

Inova Lung Transplant and Advanced Lung Disease Team Members (December 2019)

Front Row: Shalika Katugaha, MD (Med Director, Transplant ID); Kareem Ahmad, MD (Transplant Pulmonologist); Shambhu Aryal, MD (Transplant Pulmonologist); Oksana Shlobin MD (Transplant Pulmonologist, Med Director PH Program); Steven Nathan., MD (Medical Director); A.Whitney Brown, MD (Transplant Pulmonologist, Med Director, CF Program); Chris King MD, (Transplant Pulmonologist, Med Director ALD &Transplant Critical Care)

Second Row: Elizabeth Davies (Social Worker); Vijaya Dandamudi (Clinic Research Regulatory Specialist); Tina Thronson (Quality Manager); Martha Alemayehu (Clinical Research Nurse); Priscilla Dauphin (Research Coordinator); A. Claire Collins (Research Project Associate); Susan Perry (Social Worker); Meg Fregoso (Nurse Practitioner); Astrid "Julieth" Munoz (Program Manager); Johanna Coughlin (PH Coordinator) ; Deanna Ridgeway (Financial Manager); Tameka Bland (Financial Specialist); Debbie Campbell (Transplant Director); Erin Lopynski (Dietician); Rebecca Hays (Clinical Research Nurse)

Third row: Lauren Marinak, Inpatient Transplant NP; Nikkie Sisserson, NP; Edwinia Battle (Research Manager); Dana Prasanna (Transplant Quality Coordinator); Alicia Echols (PH Nurse Coordinator); Andrea Grajeda (Referral Coordinator); Jessica Chun (Post transplant NP); Shanna Guzman (PH Nurse Coordinator); Sarah Scott (Office Manager); Patricia Jackson (ALD Nurse Coordinator); Lori Hill (Financial Coordinator); Michelle Schreffler (Nurse Coordinator); Lauren Cantwell NP (Clinical Manager)

Fourth row: Rebecca Packer (Nurse Coordinator); Carlos Coronel (Sr. Admin Coordinator); Adam Cochrane (Transplant Pharmacist); Vik Khangoora MD (Transplant Fellow); Jennifer Pluhacek (Research Coordinator); Aaron Bagnola (PH Pharmacist); Matthew Kott (Nurse Coordinator); Merte Lemma (Research Coordinator); Jean Pastre (Transplant Research); Yoel Sanchez Canales (Research project Associate)

Absent:
Interventional Pulmonologist: Amit "Bobby" Mahajan, MD
Surgeons: Sandeep Khandhar, MD; Liam Ryan, MD; Eric Sarin, MD; Ramesh Singh, MD ; Dan Tang, MD
Pulmonologists: Osman Malik, MD
Research: Lori Schlegel (Research Coordinator)
Nurse Coordinators: Melissa Bowen (CF Coordinator); Quyen Duong (CF RT)
Administrative: Min Ahn (Practice Manager); Susie Rivero (Sr. Admin Coordinator)