Poster

# Lung function trajectories in patients with idiopathic pulmonary fibrosis: data from the IPF-PRO Registry

American Thoracic Society (ATS) International Conference

May 13-18, 2022

SC-US-74353

P

# Lung function trajectories in patients with idiopathic pulmonary fibrosis: data from the IPF-PRO Registry

IPF-PRO™ ILD-PRO™

Megan L Neely,[1,2] Shaun Bender,[3] Anne S Hellkamp,[1,2] Jamie L Todd,[1,2] Timothy Liesching,[4] Tracy R Luckhardt,[5] Justin M Oldham,[6] Rishi Raj,[7] Eric S White,[3] Scott M Palmer[1,2]
on behalf of the IPF-PRO Registry investigators

[1]Duke Clinical Research Institute, Durham, NC, USA; [2]Duke University Medical Center, Durham, NC, USA; [3]Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, CT, USA; [4]Lahey Hospital & Medical Center, Burlington, MA, USA; [5]Department of Medicine, University of Alabama at Birmingham, Birmingham, AL, USA; [6]Department of Internal Medicine, Division of Pulmonary and Critical Care Medicine, University of California at Davis, Sacramento, CA, USA; [7]Stanford University School of Medicine, Stanford, CA, USA.

## INTRODUCTION

- Idiopathic pulmonary fibrosis (IPF) is a progressive fibrosing interstitial lung disease characterized by decline in lung function.[1]
- Decline in forced vital capacity (FVC) or diffusing capacity of the lungs for carbon monoxide (DLco) in patients with IPF has been shown to be predictive of mortality,[2,3] but few data are available on trajectories of decline in pulmonary function tests (PFTs).
- The Idiopathic Pulmonary Fibrosis Prospective Outcomes (IPF-PRO) Registry is an observational US registry of patients with IPF.[4]

## AIM

- To evaluate trajectories of lung function in patients with IPF.

## METHODS

**IPF-PRO Registry**

- Patients with IPF that was diagnosed or confirmed at the enrolling center in the previous 6 months were enrolled at 46 sites between June 2014 and October 2018.
- Patients were followed prospectively, with lung function data collected as part of routine clinical care until death, lung transplant, or withdrawal.

**Analyses**

- We assessed the trajectories of FVC % predicted and DLco % predicted over 48 months in subgroups based on time from enrollment to a terminal event (no event, ≤1 year, >1 to ≤2 years, >2 to ≤3 years, >3 years).
  - A terminal event was defined as death, lung transplant, entry into hospice care, or withdrawal from the registry due to worsening of IPF.
- We used a joint model that accounted for the irregular frequency of measurements and for potential differences in trajectories of lung function between patients who did and did not have terminal events.
  - The following covariates were included: age, sex, race/ethnicity, body mass index, family history of ILD, diagnostic criteria,[5] diagnosis of IPF prior to referral to enrolling center, oxygen use with activity and at rest, oxygen use with activity only, prior/current use of antifibrotic therapy, ever smoked, obstructive sleep apnea.
- Analyses were conducted in patients who had ≥1 FVC or DLco measurement after or ≤30 days before enrollment.

## CONCLUSIONS

- Patients in the IPF-PRO Registry who had shorter times to a terminal event (death, lung transplant, entry into hospice care, or withdrawal due to worsening of IPF) had lower FVC % predicted and DLco % predicted values at enrollment.
- Based on joint models that adjusted for factors such as demographics, disease severity, and visit patterns, the trajectories of FVC and DLco % predicted suggest that rates of decline were fairly constant over time.

## RESULTS

### Analysis cohort

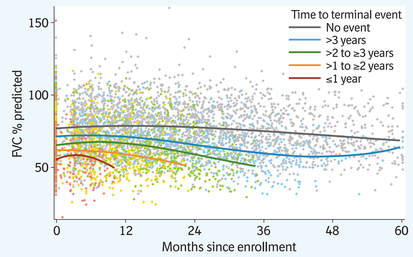
| | FVC | DLco |
|---|---|---|
| Patients who had ≥1 measurement | 940 | 901 |
| Median (Q1, Q3) measurements per patient | 4 (2, 8) | 4 (2, 7) |

### Characteristics at enrollment (n=941)

| | |
|---|---|
| Male | 698 (74) |
| Age, years | 70 (65, 75) |
| Body mass index, kg/m² | 28.9 (26.1, 32.3) |
| Definite IPF[5] | 613 (65) |
| Family history of ILD | 175 (20) |
| FVC % predicted | 72.9 (62.1, 84.2) |
| DLco % predicted | 42.5 (33.0, 51.9) |
| Oxygen use at rest | 178 (19) |
| Oxygen use with activity | 315 (33) |

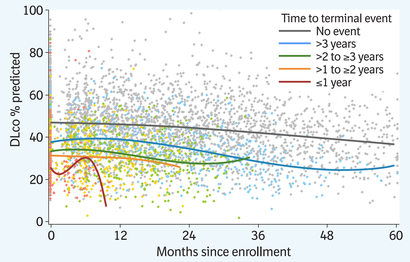
Data are median (Q1, Q3) or n (%) of patients.

### FVC % predicted values over time



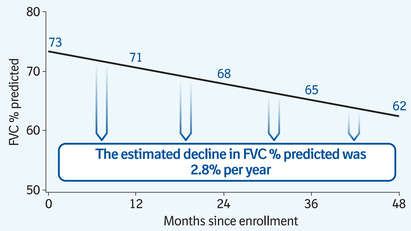

Median (Q1, Q3) follow-up in the registry was 35.1 (18.9, 47.2) months.
Smoothed lines are cubic functions fit through daily means.

### DLco % predicted values over time




Median (Q1, Q3) follow-up in the registry was 35.1 (18.9, 47.2) months.
Smoothed lines are cubic functions fit through daily means.

### Modelling of FVC % predicted over time



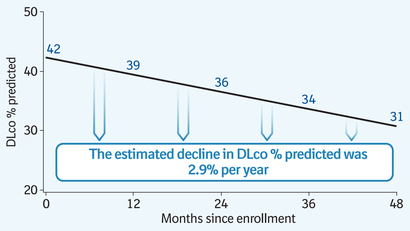

**Covariates associated with a greater rate of decline in FVC % predicted**

Male; White; Oxygen use; Family history of ILD; Antifibrotic drug use

**Covariates associated with a higher baseline value but not with the rate of decline in FVC % predicted**

Older age; Higher BMI; Current or former smoker

### Modelling of DLco % predicted over time




**Covariates associated with a greater rate of decline in DLco % predicted**

Male; White

**Covariates associated with a higher baseline value but not with the rate of decline in DLco % predicted**

Older age; Higher BMI; Never smoker; No oxygen use; Possible IPF[5]

**REFERENCES**

1. Raghu G et al. Am J Respir Crit Care Med 2018;198:e44–e68.
2. Paterniti MO et al. Ann Am Thorac Soc 2017;14:1395–402.
3. Doubková M et al. Clin Respir J 2018;12:1526–35.
4. O'Brien EC et al. BMJ Open Respir Res 2016;3:e000108.
5. Raghu G et al. Am J Respir Crit Care Med 2011;183:788–824.

**ACKNOWLEDGEMENTS AND DISCLOSURES**

The IPF-PRO/ILD-PRO Registry is funded by Boehringer Ingelheim Pharmaceuticals, Inc (BIPI) and coordinated by the Duke Clinical Research Institute (DCRI). The authors meet criteria for authorship as recommended by the International Committee of Medical Journal Editors (ICMJE). The authors did not receive payment for the development of this poster. Julie Fleming and Wendy Morris of FleishmanHillard, London, UK, provided writing, editorial and formatting assistance, which was contracted and funded by BIPI. BI was given the opportunity to review the poster for medical and scientific accuracy as well as intellectual property considerations. Megan Neely and Scott Palmer are employees of DCRI, which receives funding support from BIPI to coordinate the IPF-PRO/ILD-PRO Registry. In addition, Scott M Palmer has received grants from AstraZeneca, Bristol Myers Squibb, CareDx; royalties from UpToDate; fees from Altavant Sciences and Bristol Myers Squibb.

*Scan QR code or visit URL for a webpage featuring all BI-supported publications at ATS 2022.*

https://www.usscicomms.com/respiratory/ATS2022

*Scan QR code or visit URL for a device-friendly version of this poster including an animated version with a voiceover from the lead author.*

https://www.usscicomms.com/respiratory/ATS2022/Neely/

IPF-PRO Registry enrolling centers: Albany Medical Center, Albany, NY; Baylor College of Medicine, Houston, TX; Baylor University Medical Center at Dallas, Dallas, TX; Cleveland Clinic, Cleveland, OH; Columbia University Medical Center/New York Presbyterian Hospital, New York, NY; Duke University Medical Center, Durham, NC; Froedtert & The Medical College of Wisconsin Community Physicians, Milwaukee, WI; Houston Methodist Lung Center, Houston, TX; Lahey Clinic, Burlington, MA; Loyola University Health System, Maywood, IL; Lynchburg Pulmonary Associates, Lynchburg, VA; Medical University of South Carolina, Charleston, SC; National Jewish Health, Denver, CO; NYU Medical Center, New York, NY; Piedmont Healthcare, Austell, GA; Pulmonary Associates of Stamford, Stamford, CT; PulmonIx LLC, Greensboro, NC; Renovatio Clinical, The Woodlands, TX; Salem Chest and Southeastern Clinical Research Center, Winston Salem, NC; South Miami Hospital, South Miami, FL; St. Joseph's Hospital, Phoenix, AZ; Stanford University, Stanford, CA; Temple University, Philadelphia, PA; The Oregon Clinic, Portland, OR; Tulane University, New Orleans, LA; UNC Chapel Hill, Chapel Hill, NC; University of Alabama at Birmingham, Birmingham, AL; University of California, Davis, Sacramento, CA; University of California Los Angeles, Los Angeles, CA; University of Chicago, Chicago, IL; University of Cincinnati Medical Center, Cincinnati, OH; University of Louisville, Louisville, KY; University of Miami, Miami, FL; University of Michigan, Ann Arbor, MI; University of Minnesota, Minneapolis, MN; University of Pennsylvania, Philadelphia, PA; University of Pittsburgh, Pittsburgh, PA; University of Virginia, Charlottesville, VA; UT Southwestern Medical Center, Dallas, TX; Vanderbilt University Medical Center, Nashville, TN; Vermont Lung Center, Colchester, VT; Wake Forest University, Winston Salem, NC; Washington University, St. Louis, MO; Weill Cornell Medical College, New York, NY; Wilmington Health and PMG Research, Wilmington, NC; Yale School of Medicine, New Haven, CT.

Poster presented at the American Thoracic Society International Conference, 2022.
SC-US-74353