

Supplement

An Updated Approach to Determine Minimal Clinically Important Differences In Idiopathic Pulmonary Fibrosis.

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Appendix 1: Detailed Approach for MCID Determination

The following analysis plan will be followed for analyzing each of the three datasets (ACE-IPF, PANTHER-IPF and STEP-IPF) separately

Selected Anchor: Health Transition question (SF2) in SF-36 questionnaire

“Compared with one year ago, how would you rate your health in general now”?

(1) “much better,”

(2) “somewhat better,”

(3) “same,”

(4) “somewhat worse,” and

(5) “much worse.”

The difference between the third and the fourth responses (i.e., “same” and “somewhat worse”) was considered to represent minimal clinically important difference for worsening.

Follow-up interval:

ACE-IPF	48 weeks 111 patients
PANTHER-IPF	60 weeks 228 patients
STEP-IPF	24 weeks 140 patients

General Approach:

We conducted receiver operating curve analysis to assess responsiveness of the change in variable of interest with the anchor SF2 (dichotomous variable “same” and “somewhat worse”). Variables with both an area under the curve (AUC) ≥ 0.70 and with appropriate direction of response i.e., worsening scores with worsening response to SF2 question were selected for further MCID determination. We calculated mean change (score difference between follow-up and baseline) of each variable for patients in each of the categories in the SF2 question. The score difference of the variable from baseline to follow-up in patients who answered “somewhat worse” in response to SF2 was selected as MCID.

Steps:

1. Calculate score change in variable of interest (VOI) by subtracting follow-up scores from baseline score.

2. Assess SF2 response at follow-up time period and compute mean score change in VOI within each SF2 response category
3. Compute area under the curve (AUC) between SF2 (“same” and “somewhat worse” categories only) and VOI score change
 - a. value ≥ 0.70 selected to next step.
4. Calculate anchor-based MCID Values: Mean Score Change in “somewhat worse” SF2 Group from Baseline to Follow-up

Appendix 2:

Table S1. Description of the three randomized control trials of idiopathic pulmonary fibrosis in adult patients used for secondary data analysis

Study Name	Enrollment	Number of Centers	Sample Size	Disease Severity/ Phenotype	Treatment	Time Period	Findings
STEP-IPF	2007-2009	14 US centers	180	Severe (DLCO <35%)	Sildenafil	Two 12 weeks: 1 st placebo vs. sildenafil, 2 nd sildenafil both groups	No significant improvement in 6MWD between groups
ACE-IPF	2009-2011	22 US centers	145	Progressive phenotype (either worsening dyspnea or absolute decline of FVC \geq 10%, DLCO decline \geq 15%, arterial oxygen saturation decline \geq 5% or worsening radiographic findings)	Warfarin	48 weeks	Study terminated earlier since patients on warfarin had higher mortality, hospitalization and severe side effects
PANTHER-IPF	2009-2011	25 US centers	155	Mild to moderate (FVC \geq 50% and DLCO \geq 30%)	Prednisone, azathioprine and n-acetylcysteine	60 weeks	Trial stopped early. Treatment group with increased mortality, hospitalizations and adverse events

Abbreviations:

STEP-IPF Sildenafil Trial of Exercise Performance in Idiopathic Pulmonary Fibrosis

DLCO Diffusing capacity for carbon monoxide

6MWD Six minute walk distance

FVC Forced vital capacity

ACE-IPF AntiCoagulant Effectiveness in Idiopathic Pulmonary Fibrosis

PANTHER-IPF Prednisone, Azathioprine, and N-Acetylcysteine: A Study That Evaluates Response in Idiopathic Pulmonary Fibrosis

Table S2. Baseline characteristics of STEP-IPF patients with Health Transition question (SF2) data at 24 Weeks

Characteristic	Total Subjects (N=140)	Treatment (N=69)	Placebo (N=71)
Demographic Characteristics			
Age, years	68.47 (9.11)	69.66 (8.51)	67.35 (9.56)
Male, N (%)	114 (81.43)	58 (84.06)	56 (78.87)
White, N (%) †	130 (92.86)	63 (91.3%)	67 (94.36)
Hispanic or Latino, N (%)	10 (7.14)	6 (8.70)	4 (5.63)
Clinical Characteristics			
Past or Current Smoker, N (%)	112 (80.00)	54 (78.26)	58 (81.69)
Pulmonary Function Testing			
FEV1 %*	65.10 (16.23)	63.95 (16.88)	66.18 (15.65)
FEV1, L	1.95 (0.57)	1.91 (0.57)	1.98 (0.57)
FVC %*	58.52 (15.50)	56.37 (14.97)	60.51 (15.82)
FVC, L	2.37 (0.76)	2.29 (0.72)	2.45 (0.79)
TLC, L	3.68 (1.09)	3.62 (1.00)	3.74 (1.17)
DLCO, ml/min/mmHg	7.92 (2.12)	7.77 (1.94)	8.06 (2.28)
6MWD, meters	280.07 (112.27)	269.67 (99.88)	290.47 (123.28)
Quality of Life Scores			
Pre Borg Dyspnea Scale	0.79 (1.17)	0.84 (1.09)	0.74 (1.26)
Post Borg Dyspnea Scale	4.03 (8.09)	3.51 (1.68)	4.54 (11.25)
Total UCSD Score‡	46.82 (20.79)	49.61 (21.61)	44.21 (19.81)
EuroQol Visual Analog Score	69.34 (16.61)	68.41 (16.53)	70.26 (16.76)
Euroqol Index Score	0.80 (0.13)	0.79 (0.15)	0.80 (0.11)

*All values are percent predicted according to age, height, sex and race/ethnicity

† N Missing 10: 6 in treatment group and 4 in placebo

‡ N missing 22: 12 in treatment arm and 10 in placebo group

All other variables with N missing <5

FEV1 Forced expiratory volume in 1 second

FVC Forced vital capacity

TLC Total lung capacity

DLCO Diffusing capacity for carbon monoxide

6MWD Six-minute walk distance

SF36 36 Item Short Form Survey

SGRQ St. George's Respiratory Questionnaire

UCSD SOBQ The University of California, San Diego Shortness of Breath Questionnaire

ICECAP Investigating Choice Experiences for the Preferences of Older People Capability Instruments for Adults

Table S3. Baseline characteristics of ACE-IPF patients with Health Transition question (SF2) data at 48 weeks

Characteristic	Total Subjects (N=111)	Treatment (N=54)	Placebo (N=57)
Demographic Characteristics			
Age in years, mean (SD)	66.65 (7.49)	66.65 (7.35)	66.64 (7.68)
Male, N (%)	79 (71.17)	35 (64.81)	44 (77.19)
White, N (%)	103 (92.79)	50 (92.59)	53 (92.98)
Minority, N (%)	14 (21.61)	7 (12.96)	7 (12.28)
Clinical Characteristics			
Past or Current Smoker, N (%)	83 (74.77)	37 (68.52)	46 (80.70)
Prednisone Treatment at Randomization, N (%)	27 (24.32)	10 (18.52)	17 (29.82)
Years since IPF diagnosis, mean (SD)	0.24 (0.43)	0.19 (0.39)	0.30 (0.46)
Pulmonary Function Testing, mean (SD)			
FVC, L	2.48 (0.78)	2.42 (0.77)	2.53 (0.79)
FVC %*	61.94 (15.19)	61.77 (15.94)	62.10 (14.58)
FEV1, L	2.03 (0.61)	2.00 (0.61)	2.06 (0.61)
FEV1 %*	65.68 (15.53)	66.28 (16.86)	65.12 (14.28)
DLCO, ml/min/mmHg	10.77 (4.41)	10.69 (4.03)	10.84 (4.77)
DLCO %*	36.16 (12.90)	36.39 (12.08)	35.94 (13.75)
TLC, L	3.75 (0.99)	3.71 (0.93)	3.78 (1.05)
TLC%*	59.38 (58.72)	59.40 (13.22)	59.36 (13.60)
6MWD, meters	297.90 (128.20)	303.73 (118.35)	292.59 (137.40)
Quality of Life Scores, mean (SD)			

Pre Borg Dyspnea Scale	0.59 (0.91)	0.48 (0.92)	0.69 (0.89)
Post Borg Dyspnea Scale	2.54 (1.54)	2.28 (1.53)	2.78 (1.53)
Total SGRQ Score	45.13 (16.19)	41.99 (16.08)	48.10 (15.85)
SF36 Physical Component Score	38.13 (8.66)	40.55 (8.37)	35.84 (8.36)
SF 36 Mental Component Score	53.37 (8.33)	53.51 (7.37)	53.24 (9.21)
Total UCSD SOBQ Score	34.30 (20.71)	29.35 (17.61)	38.98 (22.42)
EuroQoL Index Score	0.76 (0.19)	0.78 (0.19)	0.75 (0.19)
EuroQol Visual Analog Score	74.90 (15.40)	75.72 (15.16)	74.14 (15.72)
ICECAP Score	0.86 (0.09)	0.87 (0.09)	0.85 (0.10)

*All values are percent predicted according to age, height, sex and race/ethnicity

FEV1 Forced expiratory volume in 1 second

FVC Forced vital capacity

TLC Total lung capacity

DLCO Diffusing capacity for carbon monoxide

6MWD Six-minute walk distance

SF36 36 Item Short Form Survey

SGRQ St. George's Respiratory Questionnaire

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Table S4. Baseline characteristics of PANTHER IPF patients with Health Transition question (SF2) data at 60 weeks

Characteristic	Total Subjects (N=228)	Treatment (N=110)	Placebo (N=118)
Demographic Characteristics			
Age, years	67.05 (8.32)	67.50 (8.43)	66.63 (8.24)
Male, N (%)	173 (75.88)	87 (79.09)	86 (72.88)
White, N (%)	219 (96.05)	105 (95.45)	114 (96.61)
Minority, N (%)	15 (6.58)	7 (6.36)	8 (6.78)
Clinical Characteristics			
Past or Current Smoker, N (%)	164 (72.25)	78 (71.56)	86 (72.88)
Years since IPF diagnosis, median (IQR)	0.72 (0.29-1.54)	0.62 (0.29-1.54)	0.79 (0.28 -1.81)
Pulmonary Function Testing			
FVC, L	2.96 (0.80)	2.99 (0.82)	2.94 (0.78)
FVC % *	73.81 (15.05)	73.65 (15.70)	73.95 (14.49)
FEV1, L	2.44 (0.64)	2.44 (0.64)	2.44 (0.64)
FEV1 % *	78.85 (16.29)	78.06 (16.42)	79.59 (16.21)
DLCO, ml/min/mmHg	13.63 (3.76)	13.58 (3.69)	13.67 (3.85)
DLCO % *	46.18 (11.36)	45.70 (10.74)	46.63 (11.94)
TLC, L	4.38 (1.03)	4.45 (1.05)	4.33 (1.01)
6MWD, meters	383.71 (107.47)	385.34 (111.03)	382.21 (104.54)
Quality of Life Scores			
Pre Borg Dyspnea Scale	0.41 (0.81)	0.44 (0.88)	0.38 (0.74)
Post Borg Dyspnea Scale	2.41 (1.66)	2.27 (1.36)	2.53 (1.89)
Total SGRQ Score	38.21 (16.80)	38.72 (16.41)	37.74 (17.21)

SF36 Physical Component Score	41.18 (9.15)	41.47 (8.95)	40.91 (9.36)
SF 36 Mental Component Score	54.65 (7.90)	53.87 (8.19)	55.38 (7.58)
Total UCSD Score	25.91 (17.54)	25.35 (16.80)	26.42 (18.26)
EuroQoL Index Score	0.83 (0.16)	0.82 (0.17)	0.84 (0.14)
EuroQol Visual Analog Score	78.25 (14.51)	78.38 (15.30)	78.13 (13.76)
ICECAP Score	0.88 (0.08)	0.88 (0.08)	0.88 (0.09)

*All values are percent predicted according to age, height, sex and race/ethnicity

FEV1 Forced expiratory volume in 1 second

FVC Forced vital capacity

TLC Total lung capacity

DLCO Diffusing capacity for carbon monoxide

6MWD Six-minute walk distance

SF36 36 Item Short Form Survey

SGRQ St. George's Respiratory Questionnaire

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Table S5. Change in physiologic and patient reported outcome measures over 24 weeks by Health Transition question (SF2) categorical responses in patients with idiopathic pulmonary fibrosis in the STEP-IPF trial

Variable	All Patients, Mean (SD) (N=140)	SF2 Response at 24-Week Follow-Up, Mean (SD)					AUC (95% CI) [†]
		Much Better (N=7)	Somewhat Better (N=13)	About the Same (N= 48)	Somewhat worse (N=62)	Much Worse (N=10)	
Physiologic Measures							
ΔFVC%*	-2.72 (4.66)	-1.89 (4.49)	0.55(3.91)	-1.78 (4.52)	-3.68 (3.96)	-7.46 (6.75)	0.62 (0.51-0.72)
ΔFVC, L	-0.11 (0.20)	-0.09 (0.19)	0.04 (0.18)	-0.07 (0.19)	-0.15 (0.16)	-0.33 (0.25)	0.62 (0.51-0.72)
RFVC, %	-4.88 (8.38)	-3.44 (8.49)	1.13 (8.00)	-2.58 (7.50)	-6.98 (7.35)	-13.03 (10.67)	0.65 (0.55-0.76)
ΔDLCO, ml/min/mmHg	-0.48 (1.53)	-0.47 (1.54)	0.00 (1.30)	-0.16 (1.42)	-0.66 (0.51)	-1.65 (2.10)	0.55 (0.44-0.66)
Δ6MWD, meters	-58.66 (96.44)	-3.71 (42.33)	-35.08 (144.51)	-32.29 (95.46)	-74.89 (69.32)	-163.00 (122.93)	0.72 (0.61-0.83)
Subjective Measures							
ΔPre Borg Dyspnea Score	1.62 (11.65)	0.07 (0.93)	0.04 (0.78)	0.13 (1.01)	3.50 (17.27)	0.06 (3.17)	0.58 (0.47-0.69)
ΔPost Borg Dyspnea Score	1.06 (14.27)	-14.29 (35.62)	-1.00 (1.73)	4.10 (19.23)	0.76 (1.89)	2.00 (3.20)	0.59 (0.49-0.70)
ΔEuroQol Index Score	-0.05 (0.17)	0.09 (0.21)	-0.05 (0.20)	0.01 (0.12)	-0.08 (0.16)	-0.20 (0.21)	0.68 (0.58-0.78)
ΔEuroQol Visual Analogue Score	-1.32 (19.69)	26.57 (24.11)	8.62 (17.57)	1.52 (16.97)	-5.84 (16.57)	-21.89 (0.42)	0.66 (0.55-0.76)
ΔUCSD SOBQ Total Score [‡]	5.92 (16.6)	-8.00 (7.94)	-5.33 (13.66)	2.60 (9.92)	7.90 (19.10)	24.00 (13.83)	0.55 (0.43-0.68)

*All values are percent predicted according to age, height, sex and race/ethnicity

† Receiver operating curve comparing dichotomous SF2 response (about the “same” vs. “somewhat worse”) and mean change score of variable

‡ N missing 39 (4 “much better”, 7 “somewhat better”, 13 “same”, 12 “somewhat worse”, 3 “much worse”). For all other variables the SF2 columns had N missing ≤ 5 .

Δ Absolute change over 24 weeks

Abbreviations:

AUC Area under curve

FVC Forced vital capacity

RFVC Relative difference in forced vital capacity

TLC Total lung capacity

DLCO Diffusing capacity for carbon monoxide

6MWD Six-minute walk distance

UCSD SOBQ The University of California, San Diego Shortness of Breath Questionnaire

Table S6. Change in physiologic and patient reported outcome measures over 48 weeks by Health Transition question (SF2) categorical responses in patients with idiopathic pulmonary fibrosis in the ACE-IPF trial

Variable	All Patients, Mean (SD), (N=111)	SF2 Response at 48-Week Follow-Up, Mean (SD)				AUC (95%CI)†
		Somewhat Better (N=6)	About the Same (N= 57)	Somewhat worse (N=41)	Much Worse (N=7)	
Physiologic Measures						
ΔFVC%*	-2.11 (6.61)	-1.00 (7.18)	-1.23 (5.61)	-1.73 (6.14)	-12.39 (8.94)	0.54 (0.41-0.66)
ΔFVC, L	-0.09 (0.26)	-0.04 (0.29)	-0.05 (0.20)	-0.08 (0.25)	-0.50 (0.40)	0.55 (0.42-0.69)
RFVC, %	-3.38 (10.61)	-0.21 (10.15)	-1.66 (8.33)	-3.23 (10.78)	-20.95 (12.53)	0.54 (0.42-0.66)
ΔTLC, L	0.00 (0.59)	0.15 (0.74)	0.06 (0.55)	-0.05 (0.60)	-0.34 (0.69)	0.58 (0.47-0.70)
ΔDLCO%*‡	-4.34 (9.80)	-0.23 (5.02)	-2.15 (6.38)	-7.22 (13.54)	-12.29 (7.13)	0.60 (0.48-0.73)
ΔDLCO, ml/min/mmHg‡	-1.34 (2.94)	-0.23 (1.32)	-0.64 (1.82)	-2.23 (4.11)	-3.83 (2.31)	0.61 (0.48-0.74)
Δ6MWD, meters	-37.50 (114.96)	-18.81 (48.96)	-19.60 (119.23)	-49.31 (107.52)	-129.20 (119.90)	0.60 (0.48-0.71)
Subjective Measures						
ΔPre Borg Dyspnea Score	0.25 (1.29)	-0.30 (1.64)	0.01 (1.18)	0.57 (1.36)	1.10 (0.89)	0.60 (0.48-0.72)
ΔPost Borg Dyspnea Score§	0.49 (1.82)	-0.40 (1.34)	0.23 (1.60)	0.51 (1.55)	4.00 (2.65)	0.56 (0.44-0.69)
ΔSF36 Physical Component Score	-2.49 (7.15)	2.80 (9.21)	-1.60 (6.38)	-2.76 (6.73)	-12.77 (4.86)	0.55 (0.43-0.67)
ΔSF36 Mental Component Score	-1.56 (7.33)	1.81 (5.45)	-0.16 (6.65)	-2.81 (8.04)	-8.70 (4.35)	0.57 (0.45-0.68)
ΔEuroQol	-0.03 (0.18)	0.07 (0.08)	-0.01 (0.18)	-0.05 (0.20)	-0.07 (0.21)	0.54 (0.42-0.66)

Index Score						
ΔEuroQol Visual Analogue Score	-5.86 (15.19)	1.80 (11.01)	-3.21 (11.80)	-7.46 (17.35)	-23.57 (17.49)	0.59 (0.47-0.70)
ΔTotal SGRQ Score	4.54 (11.62)	0.57 (21.17)	2.41 (8.44)	5.20 (11.16)	20.73 (14.27)	0.58 (0.46-0.70)
ΔUCSD SOBQ Total Score	8.42 (16.65)	8.83 (12.25)	5.54 (10.86)	6.98 (16.65)	40.00(27.45)	0.53 (0.41-0.64)
ΔICECAP Score	-0.02 (0.10)	0.04 (0.12)	0.00(0.06)	-0.02 (0.11)	-0.16 (0.08)	0.59 (0.47-0.71)

*All values are percent predicted according to age, height, sex and race/ethnicity

† Receiver operating curve comparing dichotomous SF2 response (about the “same” vs. “somewhat worse”) and mean change score of variable

‡ N missing 12 (0 “somewhat better”, 3 “same”, 8 “somewhat worse”, 1 “much worse”)

§ N missing 15 (1 “somewhat better”, 6 “same”, 6 “somewhat worse”, 2 “much worse”)

For all other variables the SF2 columns had N missing ≤ 5.

Δ Absolute change over 48 weeks

Abbreviations:

AUC Area under curve

FVC Forced vital capacity

RFVC Relative difference in forced vital capacity

TLC Total lung capacity

DLCO Diffusing capacity for carbon monoxide

6MWD Six-minute walk distance

SF36 36 Item Short Form Survey

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Table S7. Change in physiologic and patient reported outcome measures over 60 weeks by Health Transition question (SF2) categorical responses in patients with idiopathic pulmonary fibrosis in the PANTHER-IPF trial.

Variable	All Patients, Mean (SD) (N=228)	SF2 Response at 60-Week Follow-Up, Mean (SD)					AUC (95% CI)†
		Much Better (N= 11)	Somewhat Better (N=32)	About the Same (N= 101)	Somewhat worse (N=74)	Much Worse (N=10)	
Physiologic Measures							
ΔFVC%*	-4.09 (6.75)	1.18 (7.31)	-2.64 (6.77)	-2.73 (5.80)	-6.65 (5.97)	-10.09 (11.13)	0.68 (0.60-0.76)
ΔFVC, L	-0.16 (0.28)	0.05 (0.29)	-0.10 (0.29)	-0.10 (0.23)	-0.27 (0.25)	-0.40 (0.44)	0.68 (0.60-0.76)
RFVC, %	-5.74 (9.99)	1.93 (10.81)	-3.46 (9.63)	-3.68 (8.06)	-9.46 (8.91)	-15.82 (19.43)	0.69 (0.61-0.77)
ΔTLC, L	-0.15 (0.49)	-0.01 (0.36)	0.07 (0.51)	-0.12 (0.44)	-0.27 (0.49)	-0.56 (0.63)	0.64 (0.55-0.73)
ΔDLCO%*	-4.28 (7.62)	0.38 (6.17)	-4.86 (5.91)	-3.32 (7.18)	-5.16 (8.06)	-14.78 (10.07)	0.59 (0.50-0.68)
ΔDLCO, ml/min/mmHg	-1.27 (2.21)	0.23 (1.72)	-1.37 (1.65)	-0.98 (1.99)	-1.58 (2.44)	-4.46 (2.91)	0.58 (0.50-0.67)
Δ6MWD, meters	-34.53 (100.53)	-2.32 (46.60)	-18.23 (119.36)	-22.64 (77.60)	-52.11 (113.71)	-229.00 (91.69)	0.57 (0.48-0.66)
Subjective Measures							
ΔPre Borg Dyspnea Score	0.29 (1.39)	-0.27 (0.52)	-0.39 (0.90)	0.39 (1.06)	0.51 (1.87)	1.30 (1.72)	0.51 (0.42-0.60)
ΔPost Borg Dyspnea Score	0.32 (0.92)	-1.27 (2.04)	-0.47 (1.78)	0.26 (1.61)	0.83 (2.01)	3.63 (1.60)	0.61 (0.52-0.69)
ΔSF36 Physical Component Score	-2.25 (8.07)	8.00 (11.57)	-0.92 (6.26)	-0.06 (5.72)	-6.79 (8.07)	-5.29 (9.26)	0.75 (0.67-0.83)
ΔSF36 Mental	-1.35 (8.61)	-0.29 (12.78)	-1.43 (9.66)	-0.41 (6.05)	-0.56 (7.61)	-17.35 (13.32)	0.47 (0.38-0.56)

Component Score							
Δ EuroQol Index Score	-0.04 (0.17)	-0.01 (0.19)	-0.06 (0.13)	0.01 (0.17)	-0.07 (0.14)	-0.29 (0.32)	0.66 (0.58-0.75)
Δ EuroQol Visual Analogue Score [‡]	-1.50 (17.19)	15.90 (16.39)	1.07 (10.75)	1.53 (16.35)	-5.79 (16.14)	-25.67 (18.86)	0.63 (0.54-0.72)
Δ Total SGRQ Score [§]	4.54 (13.74)	-13.70 (14.55)	-0.97 (9.60)	1.35 (9.18)	10.95 (13.19)	25.86 (17.46)	0.71 (0.63-0.79)
Δ UCSD SOBQ Total Score	5.72 (15.94)	-4.45 (11.79)	3.19 (9.60)	0.59 (12.81)	11.38 (15.31)	34.90 (23.65)	0.72 (0.65-0.80)
Δ ICECAP Score [¶]	-0.01 (0.09)	0.04 (0.08)	-0.01 (0.08)	0.01 (0.07)	-0.03 (0.09)	-0.16 (0.19)	0.69 (0.61-0.78)

*All values are percent predicted according to age, height, sex and race/ethnicity

[†] Receiver operating curve comparing dichotomous SF2 response (about the “same” vs. “somewhat worse”) and mean change score of variable

[‡] N missing 19 (1 “much better”, 5 “somewhat better”, 9 “same”, 3 “somewhat worse”, 1 “much worse”)

[§] N missing 13 (0 “much better”, 2 “somewhat better”, 8 “same”, 3 “somewhat worse”, 0 “much worse”)

[¶] N missing 12 (0 “much better”, 0 “somewhat better”, 6 “same”, 6 “somewhat worse”, 0 “much worse”)

For all other variables the SF2 columns had N missing ≤ 5 .

Δ Absolute change over 60 weeks

Abbreviations:

AUC Area under curve

FVC Forced vital capacity

RFVC Relative difference in forced vital capacity

TLC Total lung capacity

DLCO Diffusing capacity for carbon monoxide

6MWD Six-minute walk distance

SF36 36 Item Short Form Survey

SGRQ St. George’s Respiratory Questionnaire

UCSD SOBQ The University of California, San Diego Shortness of Breath Questionnaire

ICECAP Investigating Choice Experiences for the Preferences of Older People Capability Instruments for Adults