

**<sup>129</sup>Xe MRI Ventilation Defects in ever- and never- hospitalised people with post-acute  
COVID-19 Syndrome  
Supplemental Materials**

**Table S1. Demographic Characteristics by Site**

Parameter mean (SD) [mean/MEDIAN: min-max]	Never-COVID (n=9)			Ever-COVID (n=76)		
	Site 1 (n=6)	Site 2 (n=3)	Sig. p	Site 1 (n=54)	Site 2 (n=22)	Sig. p
Age years	35 (14)	37 (6)	.8	54 (13)	50 (11)	.2
Female n (%)	3 (50)	2 (67)	.6	27 (50)	11 (50)	.9
BMI kg/m <sup>2</sup>	25 (3)	28 (9)	.8	30 (5)	29 (6)	.2
SpO <sub>2</sub> %	97 (2)	ND	-	97 (2)	98 (2)	<b>.01</b>
Heart rate beats/min	87 (20)	ND	-	77 (13)	78 (14)	1.0
Blood pressure mmHg	119/18 (79/12)	ND	-	124/83 (13/10)	126/79 (16/10)	-
Weeks Since + COVID Test	N/A	N/A	-	[15/12: 5-53]	[10/9: 5-18]	<b>.01</b>
Smoking history pack-years	0 (0)	0 (0)	1.0	7 (15)	11 (23)	.4
No Prior Respiratory Illness n (%)	0 (0)	0 (0)	1.0	35 (65)	15 (64)	.9
Prior Respiratory Illness n (%)	0 (0)	0 (0)	1.0	19 (35)	8 (36)	.9
Asthma n (%)	0 (0)	0 (0)	1.0	15 (28)	6 (27)	1.0
COPD n (%)	0 (0)	0 (0)	1.0	4 (7)	2 (9)	.8
Ever-hospitalised n (%)	N/A	N/A	-	18 (33)	5 (23)	.4
Hospital Admission days	N/A	N/A	-	14 (18)	9 (4)	.5

BMI=body mass index; ND=not done; COPD=chronic obstructive pulmonary disease.

p=significance value between Site 1 and Site 2.

**Table S2. Patient Listing of Medications at Research Visit**

Participant	Medications
P01	Symbicort; Salbutamol; Spiriva; Fluticasone; Warfarin; Rosuvastatin; Metoprolol; Spironolactone; Dapagliflozin/Metformin; Sitagliptin; Lorazepam
P02	None
P03	Indapamide; Gliclazide; Empagliflozin; Atorvastatin; Metformin; Sitagliptin; Tamsulosin; Ranitidine; Levothyroxine; Bisoprolol
P04	Insulin; Pregabalin; Gliclazide; Perindopril; Rosuvastatin; Sitagliptin/Metformin; Empagliflozin; Ezetimibe
P05	Formoterol-mometasone
P06	Pantoprazole; Apixaban
P07	Levothyroxine
P08	Levothyroxine; Symbicort; Trimethoprim and sulfamethoxazole
P09	Symbicort; Amitriptyline; Naproxen; Pregabalin; Rosuvastatin; Sertraline
P10	Salbutamol
P11	Olanzapine; Fluoxetine; Quetiapine; Salbutamol
P12	Symbicort
P13	None
P14	Fluticasone propionate-salmeterol; Salbutamol; Desvenlafaxine; Pantoprazole; Aripiprazole
P15	None
P16	Symbicort; Atenolol; Hydrochlorothiazide; Candesartan
P17	Metformin; Rosuvastatin; Amlodipine; Ramipril; Hydrochlorothiazide
P18	Metformin; Irbesartan; Esomeprazole; Tramadol; Azythromycin; Dexamethasone
P19	Rivarokaban; Levothyroxine; Oral Contraceptive
P20	Symbicort; Singulair; Tresiba; Jardiance; Ezetrol; Insulin; Rivaroxaban; Glumetza; Pravastatin; Colchicine; Pantoprazole
P21	Pregabalin
P22	Perindopril; Pantoprazole; Rosuvastatin; Spiriva; Ezetimibe; Amlodipine; Bimatropost; Salbutamol; Epipen
P23	Metformin; Symbicort
P24	None
P25	None
P26	Gabapentin; Canagliflozin; Levothyroxine; Saxagliptin; Dexamethasone; Rosuvastatin; Metformin; Symbicort
P27	Ustekinumab; Symbicort; Salbutamol
P28	Nabilone; Venlafaxine; Ferrous Gluconate; Dexamethasone; Rosuvastatin; Levothyroxine; Gabapentin
P29	Trazodone; Bupropion
P30	Symbicort
P31	None
P32	Cetirizine; Trazodone; Rizatriptan; Betahistine
P33	Fluticasone propionate-salmeterol; Salbutamol; Statin; Diuretic
P34	Sitagliptin; Gliclazide; Ramipril; Atorvastatin; Symbicort
P35	Anti-hypertension; Symbicort
P36	Furosemide; Ciclesonide; Lorazepam; Tamsulosin; Lamotrigine; Spiriva Respimat; Atorvastatin; Symbicort; Ferrous Gluconate; Apixaban; Flecainide; Salbutamol
P37	Triptans
P38	None
P39	Symbicort
P40	None
P41	Symbicort; Ipratropium bromide; Beclomethasone Nasal Spray
P42	Symbicort; Perindopril; Amlodipine

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P43	Symbicort
P44	Methylphenidate
P45	Furosemide; Ferrous fumarate; Candesartan; Rivaroxaban; Levothyroxine
P46	Tansulosin; Bisoprolol; Ferrous fumarate; Apixaban; Rosuvastatin; Amlodipine; Finasteride; Fluticasone
P47	Bupropion
P48	None
P49	Amitriptyline
P50	None
P51	Bupropion
P52	Formoterol-mometasone; Montelukast; Spiriva; Pantoprazole
P53	Formoterol-mometasone; Salbutamol
P54	None
P55	Losartan, Clortalidone
P56	Risedronic acid
P57	Candesartan, Rosuvastatin, Metformin
P58	Gabapentin, Amitriptyline, Clonazepam, Progesterone, Estradiol
P59	Methylphenidate, Vortioxetine
P60	None
P61	Spiriva, Symbicort
P62	None
P63	Gliclazide, Duloxetine, Advair, Semaglutide, Ipratropium bromide, Salbutamol, Pantoprazole, Ciclesonide, Spiriva, Atorvastatin, Metformin, Acetaminophen-codeine-caffeine
P64	Conjugated estrogens, Oxybutynin, Pantoprazole, Vortioxetine
P65	Perindopril
P66	Salbutamol
P67	Bisoprolol, Bupropion, Metoclopramide
P68	Fluticasone furoate, Salbutamol, Carbamazepine
P69	Formoterol-mometasone, Ferrous fumarate
P70	Rupatadine, Mometasone, Montelukast, Oral Contraceptive
P71	Fluticasone propionate
P72	Telmisartan, Bisoprolol, Thyroxine, Pantoprazole
P73	Metoprolol, Ramipril, Amlodipine, Metformin, Sitagliptin, Gliclazide, Rosuvastatin
P74	Levothyroxine, Rabepazole, Beclometasone, Tiotropium, Salbutamol
P75	Ramipril, Budesonide, Lansoprazole, Symbicort, Rosuvastatin, Bisoprolol, Spiriva
P76	Fluticasone salmeterol, Spiriva, Fluticasone propionate, Benralizumab

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**Table S3. Medications at Research Visit Summary**

Parameter n (%)	Ever-COVID (n=76)	Ever-hospitalised (n=23)	Never-hospitalised (n=53)
None	13 (17)	2 (9)	11 (21)
SABA	10 (13)	4 (17)	6 (11)
ICS	34 (45)	12 (52)	22 (42)
LABA	30 (39)	10 (43)	20 (38)
Anticoagulant	5 (7)	2 (9)	3 (6)
Antibiotic	2 (3)	2 (9)	0 (0)
Other	52 (68)	18 (78)	34 (64)

SABA=short-acting beta-agonist; ICS=inhaled corticosteroid; LABA=long-acting beta-agonist

**Table S4. CT Findings**

Abnormality n (%)	Ever- COVID (n=50)	No Prior Lung Diagnosis COVID (n=34)	Asthma- COVID (n=13)	COPD- COVID (n=3)
Ground-Glass Opacities	20 (40)	14 (41)	5 (38)	1 (33)
Consolidation	4 (8)	2 (6)	1 (8)	1 (33)
Reticulation	2 (4)	2 (6)	0 (0)	0 (0)
Atelectasis	14 (28)	10 (29)	4 (31)	0 (0)
Emphysema	5 (10)	1 (3)	2 (15)	2 (67)
Honeycombing	1 (2)	1 (3)	0 (0)	0 (0)
Mosaic Attenuation	4 (8)	3 (9)	1 (8)	0 (0)
Bronchial Wall Thickening	1 (2)	1 (3)	0 (0)	0 (0)
Nodules	13 (26)	8 (24)	5 (38)	0 (0)
Bronchiectasis	11 (22)	8 (24)	3 (23)	0 (0)
Bronchiolectasia	1 (2)	1 (3)	0 (0)	0 (0)

**Table S5. Pulmonary Function, Questionnaire and Imaging Measurements by Site**

Parameter	Never-COVID (n=9)			Ever-COVID (n=76)		
	Site 1 (n=6)	Site 2 (n=3)	Sig . p	Site 1 (n=54)	Site 2 (n=22)	Sig p
<i>Pulmonary function</i>						
FEV <sub>1</sub> * % <sub>pred</sub>	100 (7)	103 (17)	.7	86 (20)	81 (20)	.4
FVC* % <sub>pred</sub>	102 (7)	104 (16)	.9	87 (18)	92 (24)	.3
FEV <sub>1</sub> /FVC*	0.80 (0.05)	0.84 (0.04)	.3	0.77 (0.11)	0.74 (0.11)	.2
LCI* n breaths	9.0 (1.4)	ND	-	10.7 (3.9)	ND	-
LCI <sub>ao</sub> * n breaths	8.0 (1.3)	ND	-	9.5 (3.3)	ND	-
DL <sub>CO</sub> * % <sub>pred</sub>	-	-	-	81 (21)	105 (35)	<b>.007</b>
<i>Exercise capacity and QoL</i>						
6MWD* m	-	-	-	435 (79)	491 (80)	<b>.008</b>
SpO <sub>2</sub> post-exertion* %	-	-	-	97 (3)	99 (2)	<b>.01</b>
SGRQ*	-	-	-	34 (17)	38 (19)	.4
mMRC*	-	-	-	1 (1)	1 (1)	.3
IPAQ* MET-minutes	-	-	-	4276 (4651)	5778 (5451)	.3
<i>MRI</i>						
VDP %	1.4 (1.0)	0.5 (0.3)	.2	6.2 (7.9)	3.6 (4.3)	.2
<i>CT*</i>						
TAC	-	-	-	270 (104)	267 (139)	.9
WA mm <sup>2</sup>	-	-	-	66 (2)	67 (3)	.4
LA mm <sup>2</sup>	-	-	-	14 (3)	12 (3)	.2
WT mm	-	-	-	1.4 (0.1)	1.3 (0.1)	.2

FEV<sub>1</sub>=forced expiratory volume in 1 second; %<sub>pred</sub>=percent of predicted value; FVC=forced vital capacity; LCI=lung clearance index; ND=not done; ao=airway opening; DL<sub>CO</sub>=diffusing capacity of the lungs for carbon monoxide; QoL=quality-of-life; 6MWD=six-minute walk distance; SGRQ=St. George's Respiratory Questionnaire; mMRC=modified Medical Research Council dyspnea score; IPAQ=International Physical Activity Questionnaire; MRI=magnetic resonance imaging; VDP=ventilation defect percent; CT=computed tomography; TAC=total airway count; WA=wall area; LA=lumen area; WT=wall thickness.  
p=significance value between Site 1 and Site 2.

FEV<sub>1</sub>\*, FVC\* and FEV<sub>1</sub>/FVC\*: Ever-COVID Site 1 n=53

LCI\*: Never-COVID n=5, Ever-COVID Site 1 n=44

LCI<sub>ao</sub>\*: Never-COVID n=5, Ever-COVID Site 1 n=32

DL<sub>CO</sub>\*: Ever-COVID Site 1 n=43, Ever-COVID Site 2 n=21

6MWD\* and mMRC\*: Ever-COVID Site 1 n=43

SpO<sub>2</sub> post-exertion\*: Ever-COVID Site 1 n=43

SGRQ\*: Ever-COVID Site 1 n=44, Ever-COVID Site 2 n=20

IPAQ\*: Ever-COVID Site 1 n=42, Ever-COVID Site 2 n=17

CT\*: Ever-COVID Site 1 n=36, Ever-COVID Site 2 n=8

**Table S6. Characteristics by Previous Lung disease**

Parameter mean (SD) [mean/MEDIAN: min-max]	No Prior Lung Diagnosis COVID (n=49)	Asthma-COVID (n=21)	COPD-COVID (n=6)	Sig. p
Age years	52 (12)	55 (13)	59 (11)	.3
Female n (%)	23 (47)	14 (67)	1 (17)	-
BMI kg/m <sup>2</sup>	30 (5)	28 (6)	30 (4)	.4
SpO <sub>2</sub> %	97 (1)	97 (2)	96 (2)	.1
Heart rate beats/min	78 (13)	75 (14)	79 (8)	.6
Blood pressure mmHg	126/82 (15/10)	124/81 (13/9)	120/78 (13/13)	-
Weeks Since + COVID Test	[14/12: 5-53]	[13/12: 6-29]	[13/13: 6-20]	.8
Smoking history pack-years	4 (11)	5 (10)	50 (27)	<b>&lt;.001</b>
Ever-hospitalised n (%)	18 (37)	5 (24)	2 (33)	-
Hospital Admission days	14 (18)	8 (6)	7 (1)	-
<i>Pulmonary function</i>				
FEV <sub>1</sub> * % <sub>pred</sub>	87 (18)	82 (24)	74 (24)	.3
FVC* % <sub>pred</sub>	88 (19)	85 (21)	96 (19)	.1
FEV <sub>1</sub> /FVC*	0.79 (0.08)	0.75 (0.12)	0.60 (0.16)	<b>&lt;.001</b>
LCI* n breaths	11.1 (3.9)	9.9 (4.1)	10.4 (2.5)	.7
LCI <sub>ao</sub> * n breaths	9.3 (3.3)	10.0 (3.6)	8.4	.8
DLCO* % <sub>pred</sub>	90 (33)	88 (19)	77 (16)	.6
<i>Exercise capacity and QoL</i>				
6MWD* m	468 (74)	445 (81)	382 (127)	.05
SpO <sub>2</sub> post-exertion* %	97 (3)	98 (2)	96 (4)	.6
SGRQ*	34 (16)	38 (21)	25 (21)	.7
mMRC*	1 (1)	1 (1)	1 (1)	.7
IPAQ* MET-minutes	5286 (5448)	3577 (3727)	3060 (1767)	.5
<i>MRI</i>				
VDP %	3.6 (4.2)	6.7 (7.6)	15.8 (14.1)	<b>&lt;.001</b>
<i>CT*</i>				
TAC	294 (117)	241 (76)	126 (61)	.06
WA mm <sup>2</sup>	66 (2)	67 (2)	68 (2)	.08
LA mm <sup>2</sup>	15 (3)	12 (3)	11 (1)	.09
WT mm	1.4 (0.1)	1.3 (0.1)	1.3 (0.02)	<b>.04</b>

COPD=chronic obstructive pulmonary disease; BMI=body mass index; FEV<sub>1</sub>=forced expiratory volume in 1 second; %<sub>pred</sub>=percent of predicted value; FVC=forced vital capacity; LCI=lung clearance index; ao=airway opening; DLCO=diffusing capacity of the lungs for carbon monoxide; QoL=quality-of-life; 6MWD=six-minute walk distance; SGRQ=St. George's Respiratory Questionnaire; mMRC=modified Medical Research Council dyspnea score; IPAQ=International Physical Activity Questionnaire; MRI=magnetic resonance imaging; VDP=ventilation defect percent; CT=computed tomography; TAC=total airway count; WA=wall area; LA=lumen area; WT=wall thickness.

p=significance value for ANOVA.

FEV<sub>1</sub>\*, FVC\* and FEV<sub>1</sub>/FVC\*: Asthma-COVID n=20

LCI\*: No Prior Lung Diagnosis COVID n=29, Asthma-COVID n=12, COPD-COVID n=3

LCI<sub>ao</sub>\*: No Prior Lung Diagnosis COVID n=22, Asthma-COVID n=4, COPD-COVID n=1

DLCO\*: No Prior Lung Diagnosis COVID n=43, Asthma-COVID n=16, COPD-COVID n=5

6MWD\* and mMRC\*: No Prior Lung Diagnosis COVID n=42, Asthma-COVID n=18

SpO<sub>2</sub> post-exertion\*: No Prior Lung Diagnosis COVID n=42, Asthma-COVID n=17

SGRQ\*: No Prior Lung Diagnosis COVID n=42, Asthma-COVID n=17

IPAQ\*: No Prior Lung Diagnosis COVID n=38, Asthma-COVID n=18, COPD-COVID n=3

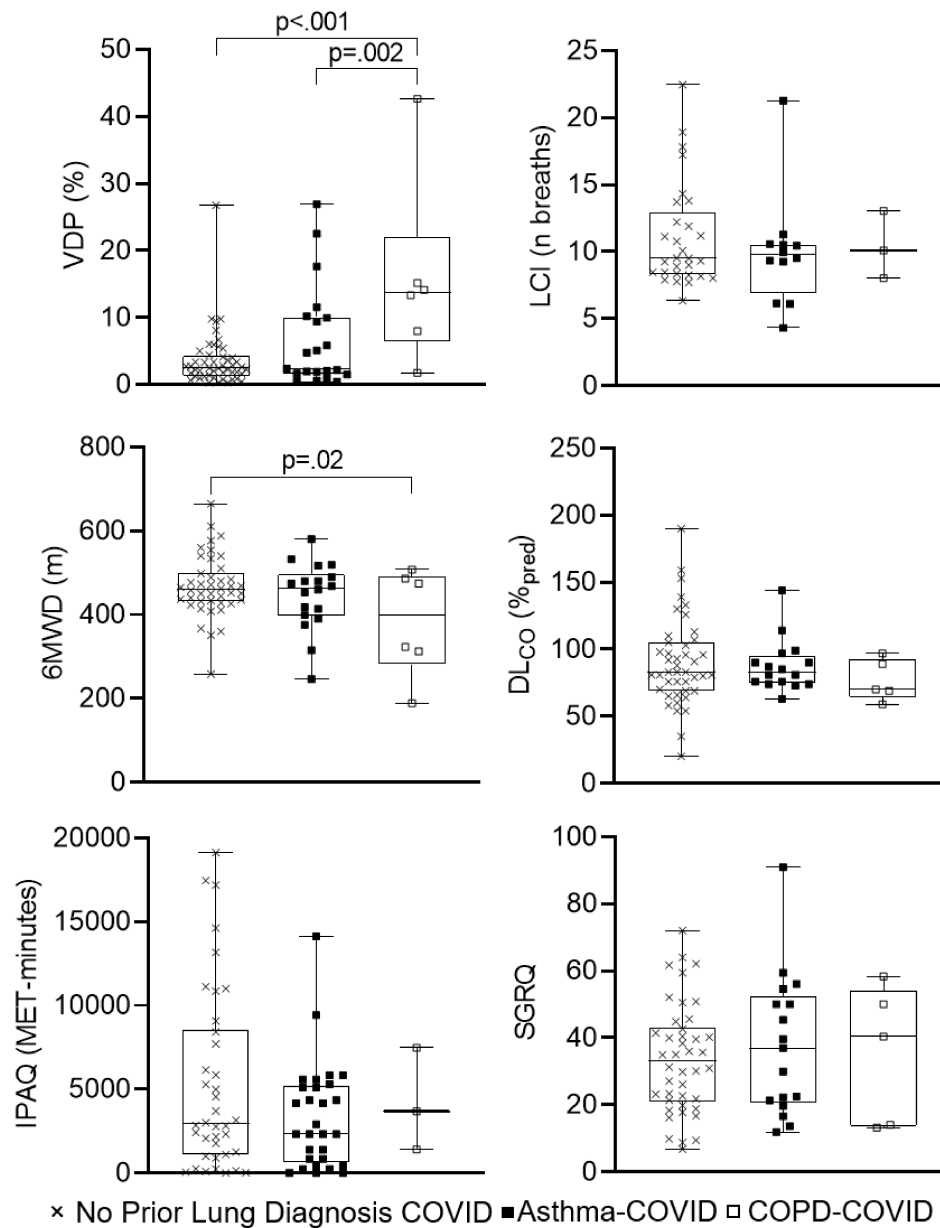


CT\*: No Prior Lung Diagnosis COVID n=28, Asthma-COVID n=14, COPD-COVID n=2

**Table S7. Relationships between pulmonary function tests, imaging and quality-of-life measurements**

	Days Since +COVID		Hospital Admission Days		BMI		Baseline SpO <sub>2</sub>		FEV <sub>1</sub>		FEV <sub>1</sub> % <sub>pred</sub>		FVC		FVC % <sub>pred</sub>		FEV <sub>1</sub> /FVC		LCI		LCI <sub>ao</sub>		DL <sub>CO</sub> % <sub>pred</sub>		6MWD		Post SpO <sub>2</sub>		Post Borg		Post RPE		SGRQ		IPAQ		mMRC		VDP		TAC		WA		LA		WT			
	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p	r/ρ	p				
Days Since +COVID	1.0		.3	.2	.1	.3	-.02	.8	.03	.8	.1	.4	.02	.9	-.5	<b>.02</b>	.1	.2	-.05	.8	-.06	.8	-.3	<b>.01</b>	-.2	.2	-.06	.5	.06	.6	.1	.4	.1	.3	.05	.7	.2	.2	.02	.9	.1	.5	.003	1.0	.2	.3	.3	.07		
Hospital Admission Days	.3	.2	1.0		-.3	.2	-.02	.9	-.2	.4	-.2	.3	-.3	.2	-.09	.5	.5	<b>.02</b>	.5	.06	.7	<b>.04</b>	-.6	<b>.005</b>	.2	.4	-.5	.06	.01	1.0	.1	.7	-.2	.5	.2	.5	.1	.6	.2	.4	.7	<b>.045</b>	-.4	.3	.6	.08	.7	<b>.02</b>		
BMI	.1	.3	-.3	.2	1.0		-.4	<b>.002</b>	-.04	.7	.1	.4	-.05	.7	.06	.6	-.08	.5	.005	1.0	-.08	.7	.2	.1	-.4	<b>&lt;.001</b>	-.1	.3	.06	.6	.3	<b>.04</b>	.2	.06	-.1	.4	.05	.7	.2	.2	-.2	.2	.3	-.1	.4	.02	.9			
Baseline SpO <sub>2</sub>	-.02	.8	-.02	.9	-.4	<b>.002</b>	1.0		.1	.3	.04	.7	.05	.7	.04	.7	.2	.1	-.3	.07	-.4	<b>.02</b>	.3	<b>.02</b>	.4	<b>.001</b>	.7	<b>&lt;.001</b>	.1	.6	-.08	.6	-.1	.3	.2	.06	-.08	.5	-.4	<b>&lt;.001</b>	.2	.2	-.2	.1	.2	.3	.02	.9		
FEV <sub>1</sub>	.03	.8	-.2	.4	-.04	.7	.1	.3	1.0		.7	<b>&lt;.001</b>	.9	<b>&lt;.001</b>	.5	<b>&lt;.001</b>	.4	<b>.003</b>	-.4	<b>.01</b>	-.3	<b>.01</b>	.4	<b>.002</b>	.3	<b>.03</b>	.1	.3	-.2	.2	.07	.7	-.2	.1	.08	.5	-.3	<b>.01</b>	-.1	.2	.2	.3	-.03	.7	.3	.07	.3	<b>.046</b>		
FEV <sub>1</sub> % <sub>pred</sub>	.1	.4	-.2	.3	.1	.4	.04	.7	.7	<b>&lt;.001</b>	1.0		.5	<b>&lt;.001</b>	.8	<b>&lt;.001</b>	.4	<b>&lt;.001</b>	-.3	<b>.048</b>	-.3	.07	.4	<b>.001</b>	.2	.1	.3	<b>.049</b>	-.2	.2	.2	.2	.2	-.1	.3	.01	.9	-.1	.3	-.3	<b>.006</b>	.3	<b>.045</b>	-.3	.07	.2	.1	.2	.3	
FVC	.02	.9	-.3	.2	-.05	.7	.05	.7	.9	<b>&lt;.001</b>	.5	<b>&lt;.001</b>	1.0		.6	<b>&lt;.001</b>	-.05	.7	-.3	.06	-.2	.3	.3	<b>.03</b>	.2	.08	.07	.6	-.1	.3	.02	.9	-.2	.08	.1	.4	-.3	<b>.02</b>	.02	.9	.01	.9	.07	.6	.02	.3	.3	.09		
FVC % <sub>pred</sub>	-.5	<b>.02</b>	-.09	.5	.06	.6	.04	.7	.5	<b>&lt;.001</b>	.8	<b>&lt;.001</b>	.6	<b>&lt;.001</b>	1.0		-.2	.2	-.3	.08	-.3	.1	.4	<b>&lt;.001</b>	.2	.2	.3	<b>.03</b>	-.1	.6	.3	<b>.02</b>	-.1	.4	.08	.6	-.1	.3	-.07	.5	.1	.4	-.02	.9	-.03	.8	-.05	.8		
FEV <sub>1</sub> /FVC	.1	.2	.5	<b>.02</b>	-.08	.5	.2	.1	.4	<b>.003</b>	.4	<b>&lt;.001</b>	-.05	.7	-.2	.2	1.0		-.1	.4	-.2	.4	.05	.7	.1	.4	.002	1.0	-.1	.4	.1	.5	-.1	.4	-.05	.7	-.08	.5	-.2	<b>.04</b>	.3	<b>.03</b>	-.4	<b>.02</b>	.3	<b>.03</b>	.2	.3		
LCI	-.05	.8	.5	.06	.005	1.0	-.3	.07	-.4	<b>.01</b>	-.3	<b>.048</b>	-.3	.06	-.3	.08	-.1	.4	1.0		.9	<b>&lt;.001</b>	-.6	<b>&lt;.001</b>	-.3	.08	.5	<b>.006</b>	-.1	.6	-.1	.5	.02	.9	.1	.6	.2	.3	.2	.1	.2	.5	-.3	.1	-.05	.8	-.1	.5		
LCI <sub>ao</sub>	-.06	.8	.7	<b>.04</b>	-.08	.7	-.4	<b>.02</b>	-.3	<b>.01</b>	-.3	.07	-.2	.3	-.3	.1	-.2	.4	.9	<b>&lt;.001</b>	1.0		-.4	<b>.02</b>	-.2	.2	-.5	<b>.007</b>	-.09	.6	-.2	.2	-.2	.2	-.2	.2	-.06	.8	-.08	.7	.3	.1	.05	.8	-.4	.06	.03	.9	.01	1.0
DL <sub>CO</sub> % <sub>pred</sub>	-.4	<b>.01</b>	-.6	<b>.005</b>	.2	.1	.3	<b>.02</b>	.4	<b>.002</b>	.4	<b>.001</b>	.3	<b>.03</b>	.4	<b>&lt;.001</b>	.05	.7	-.6	<b>&lt;.001</b>	-.4	<b>.02</b>	1.0		.4	<b>.006</b>	.3	<b>.03</b>	.1	.5	.2	.3	-.02	.9	.02	.9	-.3	<b>.02</b>	-.2	.09	.09	.6	-.04	.8	-.02	.9	-.05	.8		
6MWD	-.2	.2	.2	.4	-.4	<b>&lt;.001</b>	.4	<b>.001</b>	.3	<b>.03</b>	.2	.1	.2	.08	.2	.1	.4	-.3	.08	-.2	.2	.4	<b>.006</b>	1.0		.4	<b>&lt;.001</b>	.008	1.0	-.2	.3	-.3	<b>.02</b>	.1	.3	-.3	<b>.02</b>	-.3	<b>.01</b>	.06	.7	.02	.9	-.1	.4	-.08	.6			
Post SpO <sub>2</sub>	-.07	.6	-.5	.06	-.1	.3	.7	<b>&lt;.001</b>	.1	.4	.3	<b>.049</b>	.07	.6	.3	<b>.03</b>	.002	1.0	-.5	<b>.006</b>	-.5	<b>.007</b>	.3	<b>.03</b>	.4	<b>&lt;.001</b>	1.0		.2	<b>.046</b>	.09	.6	.07	.6	.06	.7	.1	.4	-.4	<b>&lt;.001</b>	-.09	.6	.04	.8	-.2	.1	-.2	.1		
Post Borg	.06	.6	.01	1.0	.06	.6	.1	.6	-.2	.2	-.2	.2	-.1	.3	-.1	.6	-.1	.4	-.1	.6	-.09	.6	.1	.5	.008	1.0	.2	<b>.046</b>	1.0		.6	<b>&lt;.001</b>	.6	<b>&lt;.001</b>	-.2	.2	.4	<b>&lt;.001</b>	-.02	.8	.003	1.0	.01	.5	-.2	.3	-.2	.1		
Post RPE	.1	.4	.1	.7	.3	<b>.04</b>	-.08	.6	.07	.7	.2	.2	.02	.9	.3	<b>.02</b>	.1	.5	-.1	.5	-.2	.2	-.2	.3	-.2	.3	-.09	.6	.6	<b>&lt;.001</b>	1.0		.7	<b>&lt;.001</b>	-.2	.2	.3	<b>.02</b>	.1	.5	.1	.5	.04	.8	-.07	.7	-.05	.8		
SGRQ	.1	.3	-.2	.5	.2	.06	-.1	.3	-.2	.1	-.1	.3	-.2	.08	-.1	.4	-.1	.4	.02	.9	-.2	.2	-.02	.9	-.3	<b>.02</b>	.07	.6	.6	<b>&lt;.001</b>	.7	<b>&lt;.001</b>	1.0		-.2	.09	.7	<b>&lt;.001</b>	.09	.5	-.07	.6	.1	.5	-.3	.1	-.2	.2		
IPAQ	.05	.7	.2	.5	-.1	.4	.2	.06	.08	.5	.01	.9	.1	.4	.08	.6	-.05	.7	.1	.6	-.06	.8	.02	.9	.1	.3	.06	.7	-.2	.2	-.2	.2	-.2	.2	-.1	.4	-.01	.5	.1	.5	.08	.6	-.2	.2	-.2	.2				
mMRC	.2	.2	.1	.6	.05	.7	-.08	.5	-.3	<b>.01</b>	-.1	.3	-.3	<b>.02</b>	-.1	.3	-.08	.5	.2	.3	-.08	.7	-.3	<b>.02</b>	-.3	<b>.02</b>	.1	.4	.4	<b>&lt;.001</b>	.3	<b>.02</b>	.7	<b>&lt;.001</b>	-.1	.4	1.0		.1	.3	-.06	.7	-.04	.8	-.07	.7	-.1	.5		
VDP	.02	.9	.2	.4	.2	.2	-.4	<b>&lt;.001</b>	-.1	.2	-.3	<b>.006</b>	0.2	.9	-.07	.5	-.2	<b>.04</b>	.2	.1	.3	.1	-.2	.09	-.3	<b>.01</b>	-.4	<b>&lt;.001</b>	-.02	.8	.1	.5	.08	.5	-.01	.5	.1	.3	1.0		-.1	.4	.3	.07	-.1	.4	-.2	.3		
TAC	.1	.5	.7	<b>.045</b>	-.2	.2	.2	.2	.2	.3	.3	<b>.045</b>	.01	.9	.1	.4	.3	<b>.03</b>	.2	.5	.06	.8	.09	.6	.06	.7	-.09	.6	.003	1.0	.1	.5	-.07	.6	.1	.5	-.06	.7	-.1	.4	1.0		-.8	<b>&lt;.001</b>	.7	<b>&lt;.001</b>	.5	<b>&lt;.001</b>		
WA	.003	1.0	-.4	.3	.2	.3	-.2	.1	-.06	.7	-.3	.07	.07	.6	-.02	.9	-.4	<b>.02</b>	-.3	.1	-.4	.06	-.04	.8	.02	.09	.04	.8	.01	.5	.04	.8	.1	.5	.08	.6	-.04	.8	.3	.07	-.8	<b>&lt;.001</b>	1.0		-.7	<b>&lt;.001</b>	-.4	<b>.009</b>		
LA	.2	.3	.6	.08	-.1	.4	.2	.3	.3	.07	.2	.1	.2	.3	-.03	.8	.3	<b>.03</b>	-.05	.8	.3	.9	-.02	.9	-.1	.4	-.2	.1	-.2	.3	-.07	.7	-.3	.1	-.2	.2	-.07	.7	-.1	.2	.7	<b>&lt;.001</b>	-.7	<b>&lt;.001</b>	1.0		.8	<b>&lt;.001</b>		
WT	.3	.07	.7	<b>.02</b>	.02	.9	.02	.9	.3	<b>.046</b>	.2	.3	.3	.09	-.05	.8	.2	.3	-.1	.5	.01	1.0	-.05	.8	-.08	.6	-.2	.1	-.2	.1	-.05	.8	-.2	.2	-.2	.2	-.1	.5	-.2	.3	.5	<b>.001</b>	-.4	<b>.009</b>	.8	<b>&lt;.001</b>	1.0			

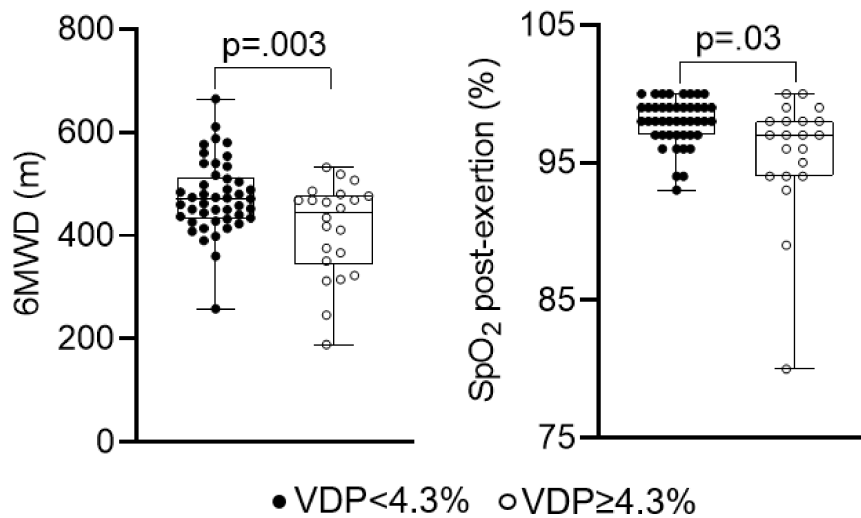
BMI=body mass index; FEV<sub>1</sub>=forced expiratory volume in 1 second; %<sub>pred</sub>=percent of predicted value; FVC=forced vital capacity; LCI=lung clearance index; ao=airway opening; DL<sub>CO</sub>=diffusing capacity of the lungs for carbon monoxide; 6MWD=six-minute walk distance; post=post-exertion (post-six minute walk test); Borg=Borg rating of perceived exertion; RPE=rated perceived exertion scale; SGRQ=St. George's respiratory capacity; IPAQ=international physical activity questionnaire; mMRC=modified medical research council dyspnea scale; VDP=ventilation defect percent; TAC=total airway count; WA=wall area; LA=lumen area; WT=wall thickness; r=Pearson correlation coefficient; ρ=Spearman correlation coefficient; p=uncorrected p value



**Figure S1.  $^{129}\text{Xe}$  MRI VDP, pulmonary function, exercise capacity and quality-of-life by prior respiratory illness**

VDP significantly different for COPD-COVID vs. no prior lung diagnosis COVID ( $p < .001$ ) and asthma-COVID ( $p = .002$ ). 6MWD significantly different for no prior lung diagnosis COVID vs. COPD-COVID ( $p = .02$ ). LCI, DLco, IPAQ and SGRQ not significantly different between groups.

VDP=ventilation defect percent; LCI=lung clearance index; 6MWD=six-minute walk distance; DLco=diffusing capacity of the lungs; %pred=percent of predicted value; IPAQ=International Physical Activity Questionnaire; SGRQ=St. George's Respiratory Questionnaire.

**Figure S2. Abnormal VDP Subgroups**

6MWD significantly worse in VDP $\geq$ 4.3% than VDP<4.3% (p=.003)

SpO<sub>2</sub> post-exertion significantly worse in VDP $\geq$ 4.3% than VDP<4.3% (p=.03)

6MWD=six-minute walk distance; VDP=ventilation defect percent