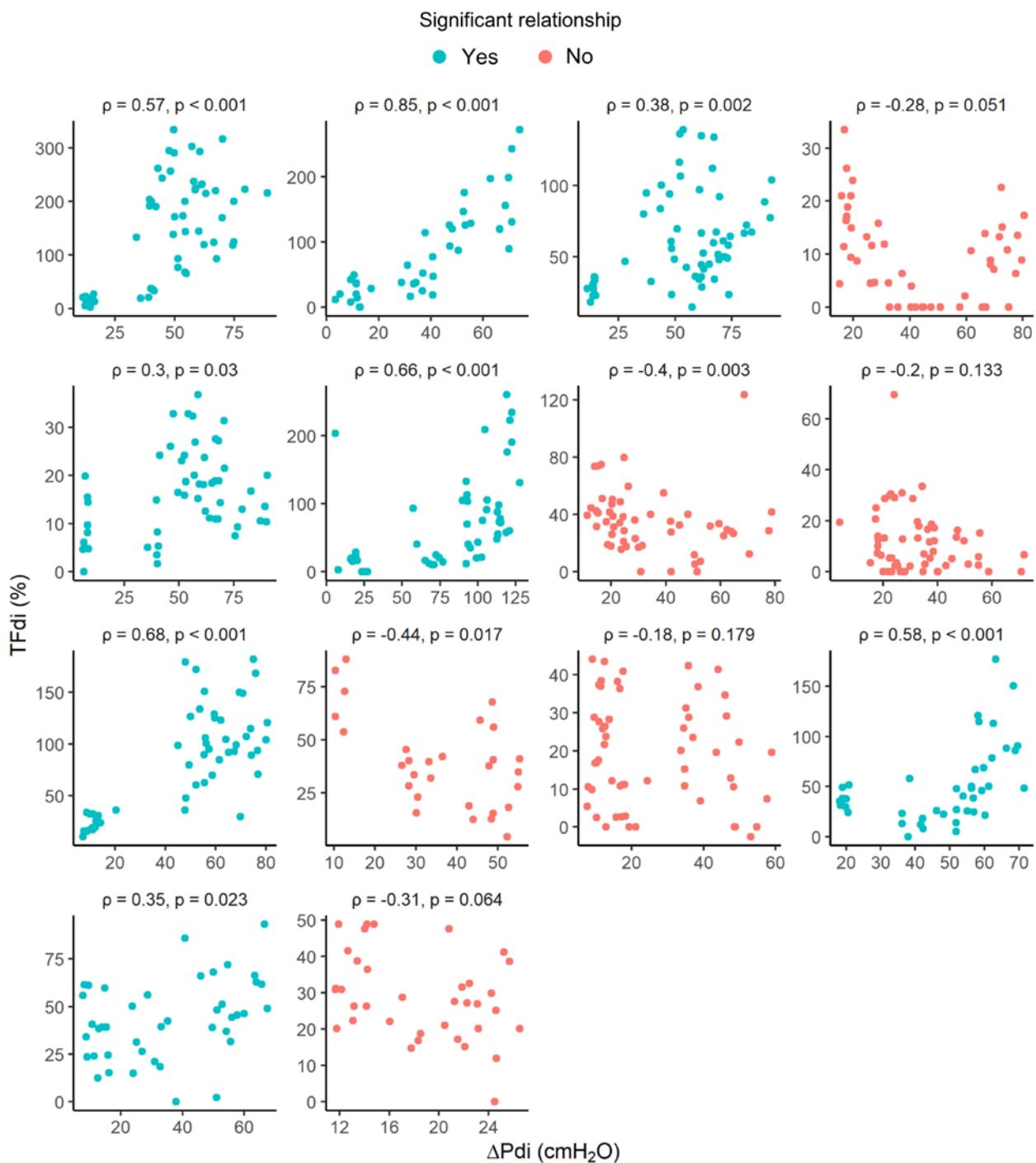


# **Poor correlation between diaphragm thickening fraction and transdiaphragmatic pressure in mechanically ventilated patients and healthy subjects**

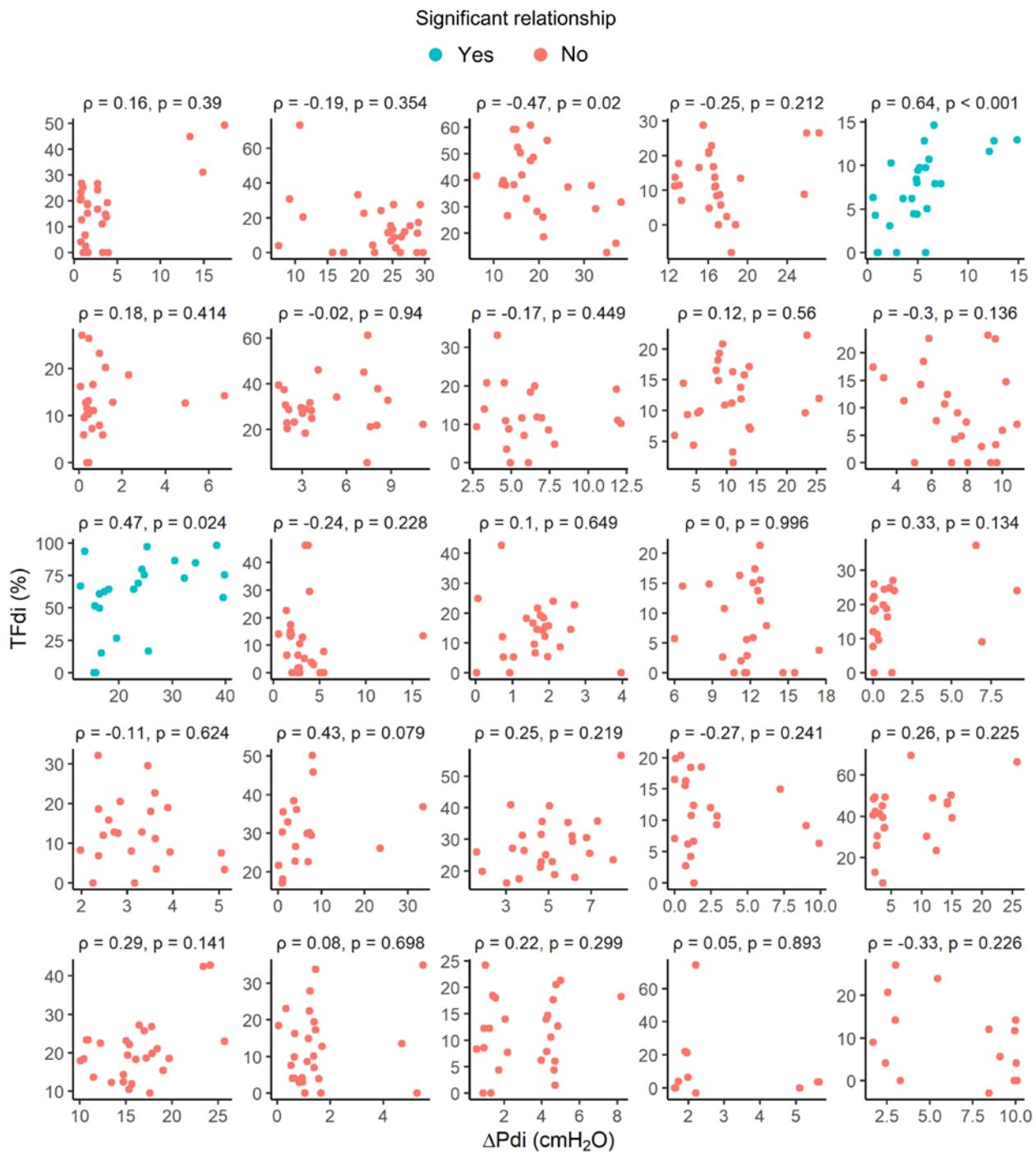
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**Supplemental Digital Content**

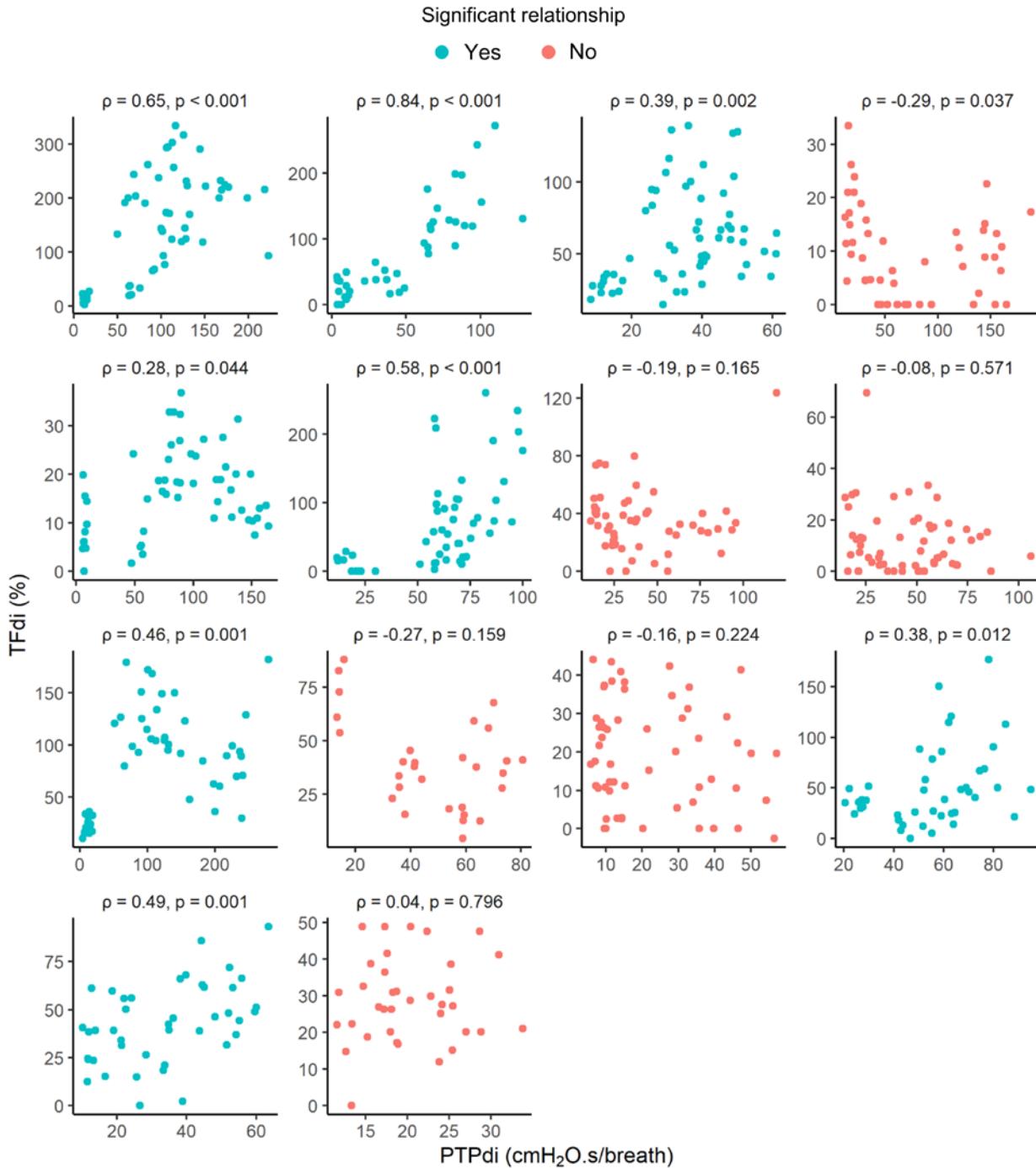
**Figure SDC1.** Individual relationships between changes in transdiaphragmatic pressure ( $\Delta P_{\text{di}}$ ) and diaphragm thickening fraction (TF $_{\text{di}}$ ) in healthy subjects.  $\rho$ , Spearman correlation coefficient.



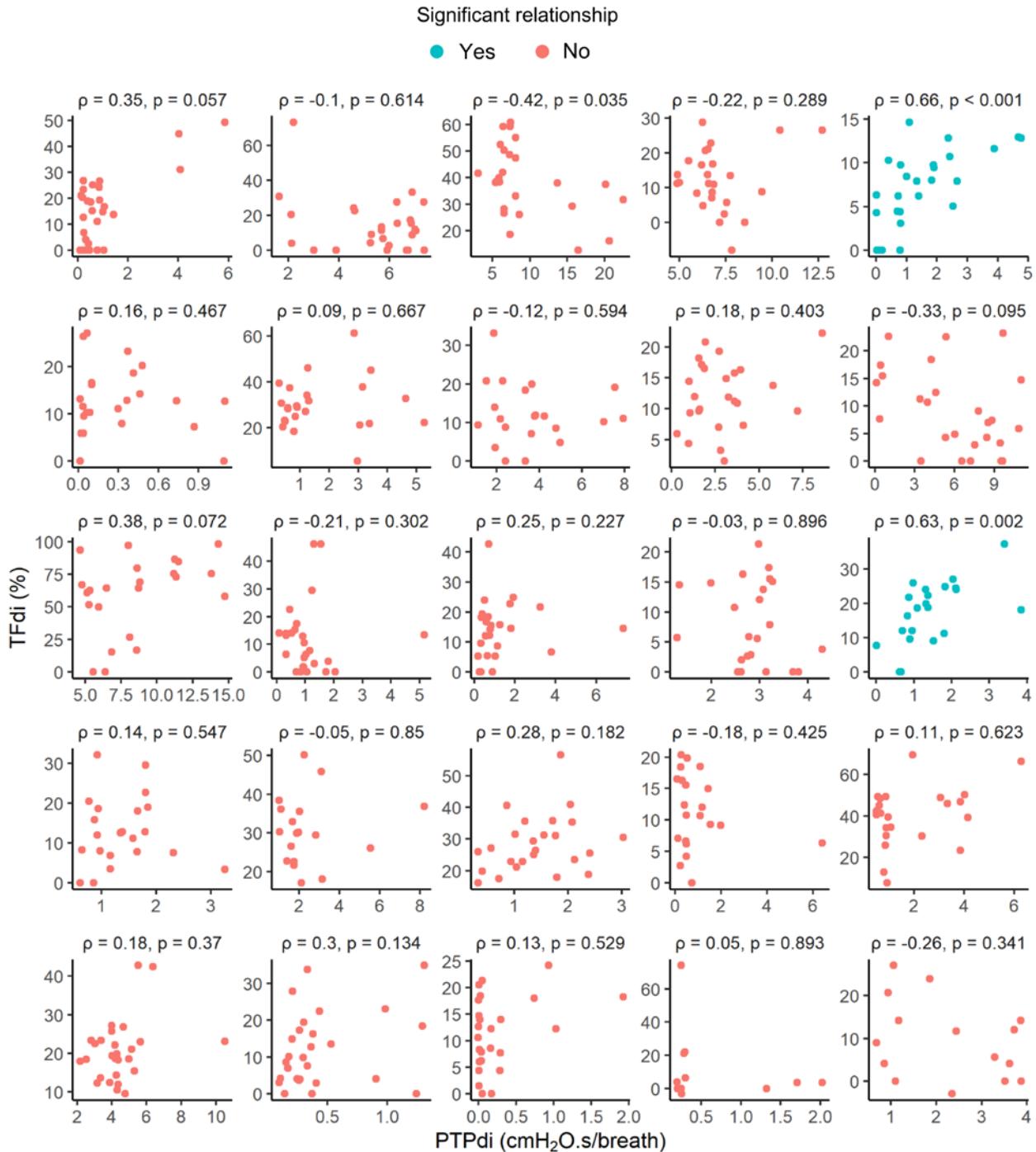
**Figure SDC2.** Individual relationships between changes in transdiaphragmatic pressure ( $\Delta P_{di}$ ) and diaphragm thickening fraction (TFdi) in mechanically ventilated patients.  $\rho$ , Spearman correlation coefficient.



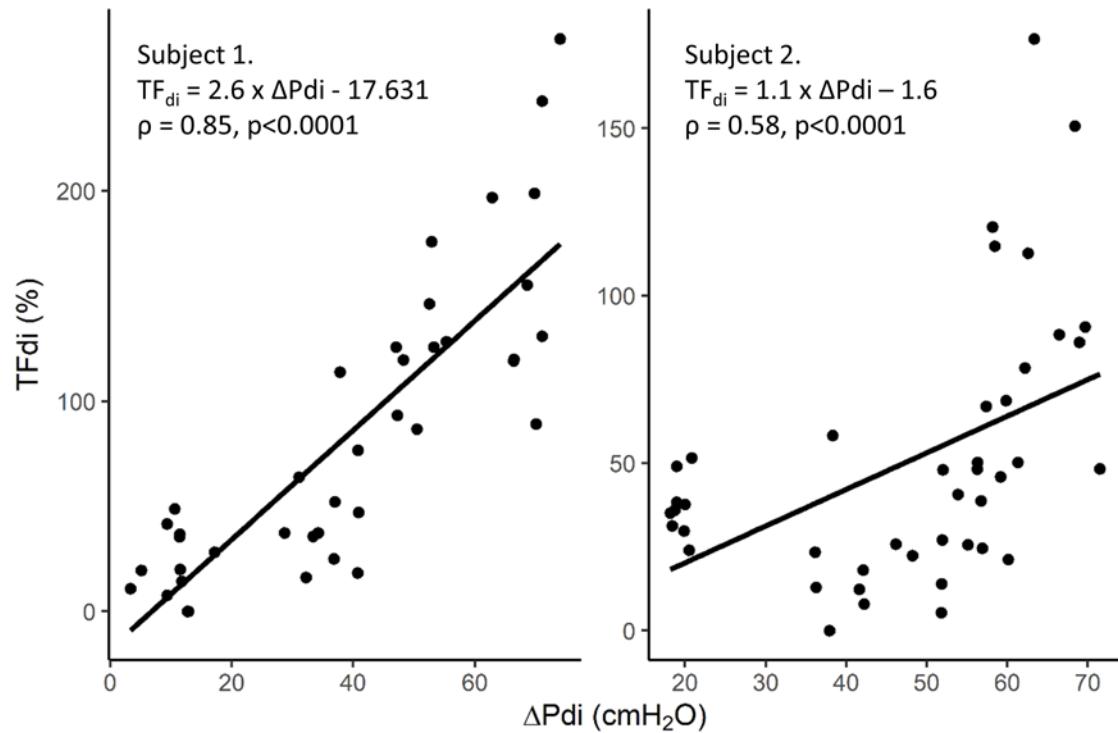
**Figure SDC3.** Individual relationships between diaphragm pressure-time product (PTPdi) and diaphragm thickening fraction (TFdi) in healthy subjects. Subjects are arranged in the same order as in Figure SDC 1.  $\rho$ , Spearman correlation coefficient.



**Figure SDC4.** Individual relationships between diaphragm pressure-time product (PTPdi) and diaphragm thickening fraction (TFdi) in mechanically ventilated patients. Patients are arranged in the same order as in Figure SDC 2.  $\rho$ , Spearman correlation coefficient.



**Figure SDC5.** Relationship between changes in transdiaphragmatic pressure ( $\Delta P_{\text{di}}$ ) and diaphragm thickening fraction (TFdi) in two healthy subjects presenting with a significant correlation between the two parameters. Although significant, the slope of the relationships greatly differs between participants.



**Table SDC1.** Healthy subjects

Variables	Inspiratory load (% of maximal inspiratory pressure)					
	0	10	20	30	40	50
TFdi, %	Median (Q1 – Q3)	25 (15 – 36)	25 (12 – 47)	31 (16 – 70)	31 (16 – 68)	45 (14 – 89)
	SEM (95% CI)	10 (8 – 12)	21 (18 – 27)	21 (17 – 26)	19 (16 – 25)	25 (20 – 32)
	ICC (95% CI)	0.75 (0.56 – 0.89)	0.87 (0.75 – 0.95)	0.93 (0.86 – 0.97)	0.91 (0.80 – 0.97)	0.89 (0.77 – 0.96)
$\Delta Pdi, \text{cmH}_2\text{O}$	Median (Q1 – Q3)	13.8 (11.4 – 17.6)	32.7 (23.7 – 40.8)	47.7 (30.1 – 55.0)	55.3 (44.1 – 66.1)	64.5 (54.4 – 76.2)
	SEM (95% CI)	2.1 (1.7 – 2.6)	7.8 (6.5 – 9.8)	4.9 (4.1 – 6.1)	4.3 (3.6 – 5.4)	8.1 (6.7 – 10.4)
	ICC (95% CI)	0.82 (0.66 – 0.93)	0.78 (0.60 – 0.91)	0.95 (0.89 – 0.98)	0.97 (0.93 – 0.99)	0.90 (0.79 – 0.97)
PTPdi, $\text{cmH}_2\text{O.s/breath}$	Median (Q1 – Q3)	14 (11 – 18)	38 (27 – 56)	62 (34 – 79)	68 (40 – 108)	78 (53 – 127)
	SEM (95% CI)	2.4 (2.0 – 3.2)	9.37 (7.68 – 12.43)	13.2 (10.8 – 17.3)	14.8 (12.1 – 19.7)	24.2 (19.4 – 33.1)
	ICC (95% CI)	0.84 (0.68 – 0.95)	0.84 (0.67 – 0.95)	0.89 (0.75 – 0.96)	0.88 (0.75 – 0.96)	0.89 (0.74 – 0.97)
PTPdi, $\text{cmH}_2\text{O.s/min}$	Median (Q1 – Q3)	155 (126 – 208)	493 (392 – 611)	701 (451 – 903)	766 (540 – 978)	938 (715 – 1245)
	SEM (95% CI)	31 (26 – 38)	88 (74 – 110)	111 (93 – 139)	122 (102 – 152)	190 (158 – 244)
	ICC (95% CI)	0.70 (0.50 – 0.87)	0.83 (0.68 – 0.93)	0.88 (0.76 – 0.95)	0.92 (0.85 – 0.97)	0.88 (0.75 – 0.96)
Respiratory rate, $\text{cycles/min}$	Median (Q1 – Q3)	12 (10 – 14)	13 (11 – 15)	12 (11 – 14)	12 (10 – 14)	12 (10 – 15)
$V_T, \text{mL/kg}$	Median (Q1 – Q3)	7.7 (5.9 – 8.9)	4.0 (3.1 – 5.3)	8.5 (6.6 – 14.3)	20.0 (9.5 – 26.9)	29.3 (10.7 – 42.8)
						41.5 (29.8 – 47.5)

Median (25 to 75<sup>th</sup> percentile), standard error of measurement (SEM) and intraclass correlation coefficient (ICC) of diaphragm thickening fraction (TFdi), changes in transdiaphragmatic pressure ( $\Delta Pdi$ ), and diaphragm pressure-time product (PTPdi) across the different breathing conditions in healthy subjects. Respiratory rate and tidal volume ( $V_T$ ) are also presented. (95% CI), 95% confidence interval.

**Table SDC2.** Mechanically ventilated patients

Variables	Condition of ventilation				
	+25PS	PS	-25PS	ZEEP	SB
TFdi , %	Median (Q1 – Q3)	18 (10 – 23)	13 (4 – 22)	15 (8 – 25)	13 (5 – 25)
	SEM (95% CI)	9 (6 – 27)	8 (5 – 18)	10 (7 – 15)	10 (7 – 16)
	ICC (95% CI)	0.72 (-0.41 – 0.94)	0.80 (0.2 – 0.95)	0.71 (0.33 – 0.90)	0.76 (0.42 – 0.92)
$\Delta Pdi, \text{cmH}_2\text{O}$	Median (Q1 – Q3)	3.5 (1.4 – 9.2)	3.8 (1.5 – 12.1)	4.3 (2.0 – 11.7)	6.0 (2.2 – 13.0)
	SEM (95% CI)	1.0 (0.7 – 3.2)	2.3 (1.6 – 5.4)	0.8 (0.6 – 1.3)	1.1 (0.8 – 1.8)
	ICC (95% CI)	0.97 (0.79 – 0.99)	0.94 (0.72 – 0.99)	0.99 (0.97 – 1.00)	0.98 (0.95 – 1.00)
PTPdi, $\text{cmH}_2\text{O.s/breath}$	Median (Q1 – Q3)	1.2 (0.5 – 2.6)	1.3 (0.6 – 4.6)	1.3 (0.5 – 3.6)	1.9 (0.9 – 4.0)
	SEM (95% CI)	0.64 (0.43 – 2.05)	1.02 (0.70 – 2.40)	0.50 (0.38 – 0.81)	0.59 (0.44 – 0.95)
	ICC (95% CI)	0.95 (0.62 – 0.99)	0.94 (0.72 – 0.99)	0.97 (0.90 – 0.99)	0.97 (0.90 – 0.99)
PTPdi, $\text{cmH}_2\text{O.s/min}$	Median (Q1 – Q3)	21 (9 – 65)	24 (11 – 98)	32 (10 – 85)	44 (18 – 112)
	SEM (95% CI)	14 (10 – 46)	27 (18 – 63)	13 (10 – 21)	14 (11 – 23)
	ICC (95% CI)	0.94 (0.51 – 0.99)	0.90 (0.54 – 0.98)	0.97 (0.91 – 0.99)	0.97 (0.91 – 0.99)
Respiratory rate, $\text{cycles/min}$	Median (Q1 – Q3)	18 (13 – 24)	21 (16 – 28)	22 (17 – 30)	24 (18 – 30)
V <sub>T</sub> , mL/kg	Median (Q1 – Q3)	5.5 (4.7 – 7.6)	4.9 (4.2 – 5.9)	4.7 (3.9 – 5.7)	3.8 (3.1 – 5.2)

Median (25 to 75<sup>th</sup> percentile), standard error of measurement (SEM) and intraclass correlation coefficient (ICC) of diaphragm thickening fraction (TFdi), changes in transdiaphragmatic pressure ( $\Delta Pdi$ ), and diaphragm pressure-time product (PTPdi) across the different breathing conditions in mechanically ventilated patients. Respiratory rate and tidal volume (V<sub>T</sub>) are also presented. (95% CI), 95% confidence interval; PS, Initial pressure support settings; +25PS, pressure support increased by 25 %; -25PS, pressure support decreased by 25 %; ZEEP, zero end-expiratory pressure with initial pressure support. SB, spontaneous breathing