

Supplementary Table S1. Distribution of demographic characteristics, comorbidities, ASA scores, vital signs, procedure duration, and doses of medications used for sedation in patients with low IPI and high IPI at 5 minutes during the EBUS procedure

	Total			Low IPI			High IPI		
	n	Median (Q1 – Q3)	n	Median (Q1 – Q3)	n	Median (Q1 – Q3)	OR (95% CI)	p-value	
		(%)		(%)		(%)			
Age (years)	65	62.0 (53.0 – 71.0)	18	63.0 (50.5 – 72.3)	47	62.0 (53.0 – 71.0)	-	0.883	
Male gender	33	50.8	6	33.3	27	57.4	0.38 (0.12 – 1.16)	0.082	
Body mass index (kg/m ²)	65	25.4 (22.7 – 29.6)	18	25.7 (22.9 – 29.5)	47	25.4 (21.6 – 29.8)	-	0.792	
Neck-height ratio	65	0.23 (0.21 – 0.26)	18	0.23 (0.22 – 0.26)	47	0.23 (0.21 – 0.26)	-	0.714	
Comorbidities*	54	83.1	13	72.2	41	87.2	0.38 (0.10 – 1.46)	0.161	
Hypertension	35	53.8	8	44.4	27	57.4	0.59 (0.20 – 1.77)	0.347	
Diabetes	14	21.5	1	5.6	13	27.7	0.15 (0.02 – 1.28)	0.089	
COPD	6	9.2	-	-	6	12.8	-	0.175	
Asthma	5	7.7	1	5.6	4	8.5	0.63 (0.07 – 6.07)	>0.999	
Coronary artery disease	14	21.5	1	5.6	13	27.7	0.15 (0.02 – 1.28)	0.089	
Congestive heart failure	5	7.7	-	-	5	10.6	-	0.311	
Malignancy	15	23.1	5	27.8	10	21.3	1.42 (0.41 – 4.95)	0.743	
Smoking status								0.010	
Never smoker	32	49.2	14	77.8	18	38.3	1.00		
Current smoker	15	23.1	3	16.7	12	25.5	0.32 (0.08 – 1.36)		
Ex-smoker	18	27.7	1	5.6	17	36.2	0.08 (0.01 – 0.64)		
Cumulative smoking (Pack-year)	33	40.0 (22.5 – 60.0)	4	30.0 (20.0 – 51.3)	29	40.0 (27.5 – 60.0)	-	0.576	
ASA score								0.172	
1	6	9.2	3	16.7	3	6.4	1.00		
2	27	41.5	9	50.0	18	38.3	0.50 (0.08 – 2.99)		

3	32	49.2	6	33.3	26	55.3	0.23 (0.04 – 1.44)	
Mallampati score								0.371
1	5	7.7	-	-	5	10.6	-	
2	38	58.6	10	55.6	28	59.6	-	
3	17	26.2	7	38.9	10	21.3	-	
4	5	7.7	1	5.6	4	8.5	-	
MAP (mmHg)	65	101.7 (94.5 – 108.5)	18	99.3 (94.3 – 108.9)	47	102.0 (94.0 – 108.7)	-	0.901
Pulse (/min)	65	79.0 (70.0 – 89.0)	18	81.0 (69.5 – 90.3)	47	79.0 (70.0 – 89.0)	-	0.814
Oxygen saturation (%)	65	99.0 (97.5 – 100.0)	18	99.0 (97.8 – 100.0)	47	99.0 (97.0 – 99.0)	-	0.448
Respiratory rate (/min)	65	18.0 (14.0 – 21.0)	18	17.5 (14.0 – 19.3)	47	19.0 (14.0 – 22.0)	-	0.617
etCO ₂ pressure (mmHg)	65	33.0 (30.5 – 36.0)	18	32.5 (30.8 – 36.3)	47	33.0 (30.0 – 36.0)	-	0.791
Baseline IPI	65	10.0 (9.0 – 10.0)	18	10.0 (10.0 – 10.0)	47	9.0 (8.0 – 10.0)	-	0.010
Hypoxemia	1	2.1	-	-	1	2.1	-	
Midazolam dose (mg)	64	2.0 (2.0 – 2.0)	18	2.0 (1.0 – 2.0)	46	2.0 (2.0 – 2.0)	-	0.197
Propofol dose (mg)	65	450.0 (300.0 – 545.0)	18	450.0 (295.0 – 542.5)	47	450.0 (300.0 – 550.0)	-	0.675
Fentanyl dose (µg)	61	100.0 (75.0 – 100.0)	17	100.0 (50.0 – 100.0)	44	100.0 (75.0 – 100.0)	-	0.339
Oxygen therapy (L/min)	65	12.0 (10.0 – 12.0)	18	12.0 (10.0 – 12.0)	47	12.0 (10.0 – 12.0)	-	0.442
STOP-Bang score	65	3.0 (2.0 – 4.0)	47	3.0 (1.8 – 4.0)	18	4.0 (2.0 – 5.0)	-	0.223
High	43	66.2	11	61.1	32	68.1	0.74 (0.24 – 2.28)	0.595
Low	22	33.8	7	38.9	15	31.9	1.00	

OR: Odds ratio, CI: Confidence interval, COPD: Chronic obstructive pulmonary disease, ASA: American Society of Anesthesiologists, MAP: Mean arterial pressure, etCO₂: end-tidal carbon dioxide, IPI: integrated pulmonary index

* Hypothyroidism (n=7), Chronic renal failure (n=5), Hyperlipidemia (n=4), Atrial fibrillation (n=4)

Statistically significant *p*-values are shown in bold.

Supplementary Table S2. Distribution of demographic characteristics, comorbidities, ASA scores, vital signs, procedure duration, and doses of medications used for sedation in patients with low IPI and high IPI at 10 minutes during the EBUS procedure

	Total			Low IPI			High IPI		
	n	Median (Q1 – Q3) (%)	n	Median (Q1 – Q3) (%)	n	Median (Q1 – Q3) (%)	OR (95% CI)	p-value	
Age (years)	64	62.0 (53.0 – 71.0)	16	61.0 (51.5 – 71.3)	48	62.0 (53.3 – 71.0)	-	0.658	
Male gender	33	51.6	5	31.3	28	58.3	0.33 (0.10 – 1.08)	0.060	
Body mass index (kg/m²)	64	25.4 (22.5 -29.7)	16	27.9 (22.1 – 29.7)	48	25.3 (22.5 – 29.4)	-	0.577	
Neck-height ratio	64	0.23 (0.22 – 0.26)	16	0.24 (0.22 – 0.26)	48	0.23 (0.21 – 0.26)	-	0.858	
Comorbidities*	53	82.8	12	75.0	41	85.4	0.51 (0.13 – 2.05)	0.445	
Hypertension	34	53.1	8	50.0	26	54.2	0.85 (0.27 – 2.63)	0.772	
Diabetes	13	20.3	-	-	13	27.1	-	0.027	
COPD	6	9.4	2	12.5	4	8.3	1.57 (0.26 – 9.51)	0.635	
Asthma	5	7.8	1	6.3	4	8.3	0.73 (0.08 – 7.09)	>0.999	
Coronary artery disease	14	21.9	3	18.8	11	22.9	0.78 (0.19 – 3.23)	>0.999	
Congestive heart failure	5	7.8	1	6.3	4	8.3	0.73 (0.08 – 7.09)	>0.999	
Malignancy	15	23.4	4	25.0	11	22.9	1.12 (0.30 – 4.18)	>0.999	
Smoking status								0.005	
Never smoker	32	50.0	12	75.0	20	41.7	1.00		
Current smoker	14	21.9	4	25.0	10	20.8	0.67 (0.17 – 2.60)		
Ex-smoker	18	28.1	-	-	18	37.5	-		
Cumulative smoking (Pack-year)	32	40.0 (21.3 – 60.0)	4	47.5 (40.0 – 79.4)	28	37.5 (20.0 – 60.0)	-	0.230	
ASA score								0.626	
1	6	9.4	2	12.5	4	8.3	1.00		
2	27	42.2	8	50.0	19	39.6	0.84 (0.13 – 5.56)		
3	31	48.4	6	37.5	25	52.1	0.48 (0.07 – 3.26)		

Mallampati score									0.770
1	5	7.8	-	-	5	10.4	-		
2	38	59.4	11	68.8	27	56.3	-		
3	16	25.0	4	25.0	12	25.0	-		
4	5	7.8	1	6.3	4	8.3	-		
MAP at minute 5 (mmHg)	64	103.7 (88.8 – 119.3)	16	106.5 (91.3 – 117.7)	48	102.8 (88.3 – 119.3)	-		0.816
Pulse at minute 5 (/min)	64	93.0 (77.3 – 102.8)	16	100.0 (80.8 – 109.8)	48	90.0 (73.8 – 101.5)	-		0.119
Oxygen saturation at minute 5 (%)	64	95.0 (89.3 – 98.0)	16	86.0 (77.3 – 92.0)	48	97.0 (93.3 – 99.0)	-		<0.001
Respiratory rate at minute 5 (/min)	64	17.0 (13.0 – 20.0)	16	16.5 (10.5 – 21.0)	48	17.0 (13.5 – 20.0)	-		0.658
etCO ₂ pressure at minute 5(mmHg)	64	35.0 (30.3 – 39.0)	16	34.0 (31.3 – 46.3)	48	35.0 (30.0 – 39.0)	-		0.456
IPI score at minute 5	64	8.0 (6.0 -10.0)	16	3.0 (1.0 – 7.8)	48	9.0 (8.0 – 10.0)	-		<0.001
Hypoxemia	18	28.1	11	68.8	7	14.6	12.87 (3.42 – 48.56)		0.774
Midazolam dose (mg)	37	57.8	13	81.3	24	50.0	4.33 (1.09 – 17.17)		0.028
Propofol dose (mg)	17	26.6	9	56.3	8	16.7	6.43 (1.85 – 22.34)		0.007
Fentanyl dose (µg)	63	2.0 (2.0 – 2.0)	16	2.0 (1.0 – 2.0)	47	2.0 (2.0 – 2.0)	-		0.092
Oxygen therapy (L/min)	64	450.0 (300.0 – 547.5)	16	460.0 (350.0 – 547.5)	48	450.0 (285.0 – 547.5)	-		0.451
STOP-Bang score	60	100.0 (75.0 – 100.0)	16	100.0 (50.0 – 100.0)	44	100.0 (75.0 – 100.0)	-		0.381
High	64	12.0 (10.0 – 12.0)	16	12.0 (10.0 – 12.0)	48	12.0 (10.0 – 12.0)	-		0.551
Low	64	3.0 (2.0 – 4.0)	16	3.0 (2.0 – 4.0)	48	3.5 (2.0 – 4.8)	-		0.782

OR: Odds ratio, CI: Confidence interval, COPD: Chronic obstructive pulmonary disease, ASA: American Society of Anesthesiologists, MAP: Mean arterial pressure, etCO₂: end-tidal carbon dioxide, IPI: integrated pulmonary index

* Hypothyroidism (n=7), Chronic renal failure (n=5), Hyperlipidemia (n=4), Atrial fibrillation (n=4)

Statistically significant *p*-values are shown in bold.

Supplementary Table S3. Distribution of demographic characteristics, comorbidities, ASA scores, vital signs, procedure duration, and doses of medications used for sedation in patients with low IPI and high IPI at 15 minutes during the EBUS procedure

	Total			Low IPI			High IPI		
	n	Median (Q1 – Q3)	n	Median (Q1 – Q3)	n	Median (Q1 – Q3)	OR (95% CI)	p-value	
		(%)		(%)		(%)			
Age (years)	60	61.5 (53.0 – 71.0)	19	65.0 (53.0 – 69.0)	41	61.0 (53.0 – 71.5)	-	0.987	
Male gender	32	53.3	8	42.1	24	58.5	0.52 (0.17 – 1.55)	0.235	
Body mass index (kg/m ²)	60	25.4 (22.6 – 30.0)	19	24.6 (20.8 – 29.8)	41	25.4 (23.7 – 29.6)	-	0.317	
Neck-height ratio	60	0.23 (0.22 – 0.25)	19	0.22 (0.21 – 0.26)	41	0.23 (0.22 – 0.25)	-	0.373	
Comorbidities*	49	81.7	14	73.7	35	85.4	0.48 (0.13 – 1.83)	0.277	
Hypertension	30	50.0	9	47.4	21	51.2	0.86 (0.29 – 2.55)	0.781	
Diabetes	13	21.7	1	5.3	12	29.3	0.13 (0.02 – 1.12)	0.045	
COPD	6	10.0	2	15.8	3	7.3	2.38 (0.44 – 13.05)	0.370	
Asthma	3	5.0	1	5.3	2	4.9	1.08 (0.09 – 12.74)	>0.999	
Coronary artery disease	13	21.7	6	31.6	7	17.1	2.24 (0.63 – 7.93)	0.312	
Congestive heart failure	5	8.3	3	15.8	2	4.9	3.66 (0.56 – 24.00)	0.314	
Malignancy	14	23.3	4	21.1	10	24.4	0.83 (0.22 – 3.07)	>0.999	
Smoking status								0.529	
Never smoker	29	48.3	11	57.9	18	43.9	1.00		
Current smoker	13	21.7	4	21.1	9	22.0	0.73 (0.18 – 2.94)		
Ex-smoker	18	30.0	4	21.1	14	34.1	0.47 (0.12 – 1.79)		
Cumulative smoking (Pack-year)	31	40.0 (20.0 – 60.0)	8	35.0 (15.0 – 58.8)	23	40.0 (25.0 – 60.0)	-	0.740	
ASA score									
1	6	10.0	3	15.8	3	7.3	1.00		
2	25	41.7	8	42.1	17	41.5	0.47 (0.08 – 2.87)		
3	29	48.3	8	42.1	21	51.2	0.38 (0.06 – 2.29)		

Mallampati score									0.401
1	5	8.3	-	-	5	12.2	-		
2	34	56.7	13	68.4	21	51.2	-		
3	16	26.7	5	26.3	11	26.8	-		
4	5	8.3	1	5.3	4	9.8	-		
MAP at minute 10 (mmHg)	60	93.8 (82.1 – 107.5)	19	95.0 (86.3 – 112.7)	41	92.0 (79.8 – 104.8)	-		0.291
Pulse at minute 10 (/min)	60	89.5 (76.8 – 100.0)	19	96.0 (75.0 – 103.0)	41	88.0 (77.5 – 99.5)	-		0.464
Oxygen saturation at minute 10 (%)	60	96.0 (90.5 – 98.8)	19	90.0 (85.0 – 96.0)	41	98.0 (95.0 – 99.0)	-		<0.001
Respiratory rate at minute 10 (/min)	60	17.0 (13.0 – 20.0)	19	15.0 (12.0 – 19.0)	41	17.0 (13.0 – 21.0)	-		0.180
etCO ₂ at minute 10(mmHg)	60	33.5 (30.0 – 38.0)	19	37.0 (32.0 – 42.0)	41	33.0 (30.0 – 38.0)	-		0.126
IPI score at minute 10	60	8.0 (5.0 – 10.0)	19	5.0 (2.0 – 8.0)	41	9.0 (8.0 – 10.0)	-		<0.001
Hypoxemia	25	41.7	13	68.4	12	29.3	5.24 (1.61 – 17.01)		0.004
Hypoventilation	10	16.7	7	36.8	3	7.3	7.39 (1.65 – 33.12)		0.008
Apnea	2	3.3	-	-	2	4.9	-		-
Midazolam dose (mg)	60	2.0 (2.0 – 2.0)	19	2.0 (1.0 – 2.0)	41	2.0 (2.0 – 2.0)	-		0.011
Propofol dose (mg)	60	450.0 (350.0 – 550.0)	19	450.0 (350.0 – 590.0)	41	450.0 (325.0 – 550.0)	-		0.981
Fentanyl dose (µg)	56	100.0 (75.0 – 100.0)	19	100.0 (50.0 – 100.0)	37	100.0 (75.0 – 100.0)	-		0.321
Oxygen therapy (L/min)	60	12.0 (10.0 – 12.0)	19	12.0 (10.0 – 12.0)	41	12.0 (10.0 – 12.0)	-		0.924
STOP-Bang score	60	3.0 (2.0 – 4.0)	19	3.0 (2.0 – 4.0)	41	3.0 (2.0 – 4.0)	-		0.733
High	39	65.0	13	68.4	26	63.4	1.25 (0.39 – 3.98)		0.705
Low	21	35.0	6	31.6	15	36.6	1.00		

OR: Odds ratio, CI: Confidence interval, COPD: Chronic obstructive pulmonary disease, ASA: American Society of Anesthesiologists, MAP: Mean arterial pressure, etCO₂: end-tidal carbon dioxide, IPI: integrated pulmonary index

* Hypothyroidism (n=7), Chronic renal failure (n=5), Hyperlipidemia (n=4), Atrial fibrillation (n=4)

Statistically significant *p*-values are shown in bold.

Supplementary Table S4. Distribution of demographic characteristics, comorbidities, ASA scores, vital signs, procedure duration, and doses of medications used for sedation in patients with low IPI and high IPI at 20 minutes during the EBUS procedure

	Total		Low IPI		High IPI		OR (95% CI)	p-value
	n	Median (Q1 – Q3) (%)	n	Median (Q1 – Q3) (%)	n	Median (Q1 – Q3) (%)		
Age (years)	58	62.0 (53.0 – 71.3)	14	61.5 (53.0 – 65.55)	44	62.5 (53.3 – 72.8)	-	0.200
Male gender	30	51.7	5	35.7	25	56.8	0.42 (0.12 – 1.47)	0.169
Body mass index (kg/m ²)	58	25.4 (22.2 – 29.8)	14	22.7 (19.6 – 27.3)	44	25.9 (23.6 – 31.0)	-	0.023
Neck-height ratio	58	0.23 (0.22 – 0.26)	14	0.22 (0.21 – 0.24)	44	0.23 (0.22 – 0.26)	-	0.066
Comorbidities*	48	82.8	10	71.4	38	86.4	0.40 (0.09 – 1.67)	0.233
Hypertension	29	50.0	7	50.0	22	50.0	1.00 (0.30 – 3.33)	>0.999
Diabetes	12	20.7	2	14.3	10	22.7	0.57 (0.11 – 2.96)	0.711
COPD	6	10.3	2	14.3	4	9.1	1.67 (0.27 – 10.24)	0.624
Asthma	3	5.2	-	-	3	6.8	-	>0.999
Coronary artery disease	13	22.4	4	28.6	9	20.5	1.56 (0.40 – 6.13)	0.714
Congestive heart failure	5	8.6	3	21.4	2	4.5	5.73 (0.85 – 38.61)	0.085
Malignancy	14	24.1	1	7.1	13	29.5	0.18 (0.02 – 1.55)	0.151
Smoking status								0.272
Never smoker	28	48.3	8	57.1	20	45.5	1.00	
Current smoker	12	20.7	4	28.6	8	18.2	1.25 (0.29 – 5.35)	
Ex-smoker	18	31.0	2	14.3	16	36.4	0.31 (0.06 – 1.68)	
Cumulative smoking (Pack-year)	30	40.0 (20.0 – 60.0)	6	45.0 (37.5 – 63.1)	24	37.5 (16.3 – 60.0)	-	0.273
ASA score								0.168
1	5	8.6	3	21.4	2	4.5	1.00	
2	25	43.1	5	35.7	20	45.5	0.17 (0.02 – 1.28)	
3	28	48.3	6	42.9	22	50.0	0.18 (0.03 – 1.35)	

Mallampati score									0.127
1	5	8.6	2	14.3	3	6.8	1.00		
2	32	55.2	9	64.3	23	52.3	0.59 (0.08 – 4.12)		
3	16	27.6	1	7.1	15	34.1	0.10 (0.01 – 1.49)		
4	5	8.6	2	14.3	3	6.8	1.00 (0.08 – 12.56)		
MAP at minute 15 (mmHg)	58	113.0 (95.8 – 131.0)	14	102.5 (94.8 – 122.8)	44	116.0 (99.0 – 134.0)	-		0.148
Pulse at minute 15 (/min)	58	68.0 (58.0 – 81.0)	14	66.5 (56.0 – 74.8)	44	68.0 (60.3 – 81.0)	-		0.393
Oxygen saturation at minute 15(%)	58	82.0 (71.6 – 96.3)	14	78.7 (69.8 – 88.5)	44	84.3 (72.8 – 97.4)	-		0.203
Respiratory rate at minute 15 (/min)	58	86.0 (73.0 – 97.0)	14	89.5 (84.0 – 100.0)	44	85.5 (70.5 – 96.8)	-		0.154
etCO ₂ pressure at minute 15 (mmHg)	58	97.0 (91.0 – 99.0)	14	88.0 (84.5 – 95.8)	44	98.0 (94.0 – 99.0)	-		0.001
IPI score at minute 15	58	17.5 (13.0 – 21.3)	14	20.0 (16.0 – 22.0)	44	17.0 (13.0 – 21.0)	-		0.228
Hypoxemia	58	33.0 (29.0 – 41.3)	14	32.0 (26.8 – 44.5)	44	33.5 (29.3 – 41.0)	-		0.636
Hypoventilation	58	8.0 (6.0 – 9.0)	14	4.5 (2.8 – 7.3)	44	8.5 (7.0 – 10.0)	-		<0.001
Apnea	19	32.8	10	71.4	9	20.5	9.72 (2.47 – 38.32)		0.001
Midazolam dose (mg)	20	34.5	9	64.3	11	25.0	5.40 (1.49 – 19.59)		0.011
Propofol dose (mg)	11	19.0	4	28.6	7	15.9	2.11 (0.52 – 8.69)		0.433
Fentanyl dose (µg)	58	2.0 (2.0 – 2.0)	14	2.0 (1.4 – 2.0)	44	2.0 (2.0 – 2.0)	-		0.265
Oxygen therapy (L/min)	58	450.0 (350.0 – 550.0)	14	375.0 (257.5 – 475.0)	44	470.0 (355.0 – 580.0)	-		0.022
STOP-Bang score	54	100.0 (75.0 – 100.0)	14	100.0 (75.0 – 100.0)	40	100.0 (75.0 – 100.0)	-		0.901
High	58	12.0 (10.0 – 12.0)	14	12.0 (10.0 – 12.0)	44	12.0 (10.0 – 12.0)	-		0.736
Low	58	3.0 (2.0 – 4.0)	14	2.5 (1.8 – 4.0)	44	3.5 (2.0 – 4.0)	-		0.207

OR: Odds ratio, CI: Confidence interval, COPD: Chronic obstructive pulmonary disease, ASA: American Society of Anesthesiologists, MAP: Mean arterial pressure, etCO₂: end-tidal carbon dioxide, IPI: integrated pulmonary index

*Hypothyroidism (n=7), Chronic renal failure (n=5), Hyperlipidemia (n=3), Atrial fibrillation (n=4)

Statistically significant *p*-values are shown in bold.

Supplementary Table S5. The association between low integrated pulmonary index / hypoxia and STOP-Bang score / high obstructive sleep apnea risk according to the STOP-Bang score using the logistic regression analysis

Low IPI										
	Min 5		Min 10		Min 15		Min 20		Ever	
	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
STOP-Bang score	0.80 (0.50 – 1.26)	0.331	1.15 (0.74 – 1.80)	0.530	1.18 (0.75 – 1.85)	0.471	1.03 (0.62 – 1.71)	0.904	0.66 (0.43 – 1.02)	0.061
STOP-Bang score ≥ 3	1.05 (0.23 – 4.84)	0.954	3.94 (0.60 – 25.99)	0.155	3.97 (0.70 – 22.41)	0.119	1.01 (0.21 – 4.83)	0.993	0.27 (0.07 – 1.14)	0.075
Hypoxemia										
	Min 5		Min 10		Min 15		Min 20		Overall	
	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
STOP-Bang score	1.26 (0.85 – 1.86)	0.243	1.17 (0.80 – 1.72)	0.421	1.65 (1.02 – 2.67)	0.040	1.23 (0.77 – 1.97)	0.398	1.29 (0.82 – 2.03)	0.280
STOP-Bang score ≥ 3	1.79 (0.51 – 6.32)	0.363	2.20 (0.55 – 8.74)	0.265	14.63 (2.02 – 105.87)	0.008	2.31 (0.41 – 13.16)	0.347	3.54 (0.83 – 15.21)	0.089

Adjusted for age, gender, cumulative smoking (pack-year), presence of any comorbidity, midazolam, and propofol dose

Min: Minute, OR: Odds ratio, CI: Confidence interval, IPI: integrated pulmonary index