

Table II - Summary of the characteristics and outcomes of included studies

Study characteristics				Intervention characteristics		Outcome characteristics
Author/Year/ Country	Type of study/ Context	Sample size/% males /mean age (+SD)	Quality assess ment	Intervention x Control	Outcome variables	Main findings (After statistical adjustments where applicable)
Hakked et al. 2017/ India	Randomized matched control clinical study.	27 (EG, N = 14; CG, N = 13) / 52%/ By groups: YBP = 15.23 ± 1.59y; CG =15.08 ± 1.26y.	12 (moderate)	Yogic Breathing Practices (YBP) group: 30 min; 5 d/week for 1 month + regular swimming and physical training. CG: physical training practices only.	Pulmonary function: Spirometry test - SVC, IRV, FVC, MVV and MV, and PEF on day 1 and day 30. Swimming performance: Subjective observation of swimming strokes per breath on day 1 and day 30.	Lung function: Significant improvement in MVV ($F_{(1,22)} = 6.06$, $p = 0.02$) and FVC ($F_{(1,22)} = 5.68$, $p = 0.026$) between the groups following intervention. No significant differences were observed in SVC, IRV, MV and PEF. Swimming performance: Post-intervention measures showed a significant increase in number of strokes per breath in the YBP group compared to CG ($F_{(1,22)} = 13.06$, $p = 0.002$).
Burtch et al. /2017/ USA	Randomized clinical trial	20 (EG, N = 9; CG, N = 11) / 56%/ 20±1y.	7 (weak)	Both groups performed a 1,000-m warm-up of easy mixed swimming. Workout: 4 training sessions/week for 4 weeks, for 35 min. It consisted of 12 repetitions of a 50-m swim. The Controlled frequency breathing (CFB): limited their breathing to 2 breaths per lap, resulting in 24 breaths per workout.	Swimming performance: 200- yard time in sec. Respiratory muscle strength: MIP and MEP Lung function: Spirometry - FVC, FEV in 1 second, FEF rate over the middle half of expiration (FEF25–75), and PEF rate.	Swimming performance: Four weeks of CFB training did not improve swim performance compared to CG ($p = 0.479$). Respiratory muscle strength: an all-out 200-yard swim led to a 12% decrease in mean MIP scores at 46 sec. post-race (116 cm H ₂ O, $P < 0.001$, 95% CI -7 to -23 cm H ₂ O). After 1.3 minutes post-exercise, mean MIP scores returned to near baseline values. After 4 weeks of CFB training, the drop in mean MIP scores from pre- to 46 sec. post-time trial was eliminated compared to CG. MEP scores did not change post-race at baseline or after race post training. Lung function: No significant difference was found (Fisher's exact test, $p = 0.32$ for both).

				CG: breathed on a stroke-matched basis, breathing every 2–3 strokes, resulting in 10–12 breaths per lap.	Aerobic capacity (measure using treadmill measures): VO2max.	Aerobic capacity: No effects were found in CFB training group nor in the CG.
Vasicková et al. 2017/ Czech Republic	Randomized, evaluator-blinded, controlled crossover trial.	20 (EG, N = 12; CG, N = 8) / Not shown / By Groups: EG = 12.0 ± 1.7 y; CG = 11.5 ± 2.4 y.	10 (moderate)	EG: regular swimming training with daily RMT for 1 month. RMT included threshold IMT (inspiratory muscle trainer) and Threshold PEP (positive expiratory pressure) devices daily for 1 month of RMT and RMST. The resistances were adjusted at 30 % of their maximum measured values PImax and PEmax initially and increased weekly by 2 cm H2O until maximal possible resistance was reached, and maintained. Both respiratory devices were used daily. RMST: 10 repetitions of maximal inspiration with the Threshold IMT and 10 repetitions of maximal expiration with the Threshold PEP. RMT: 15 minutes for each device.	Lung function: VC, FVC, IC, FEV1, and PEF. Respiratory Muscle Strength: PImax and PEmax. Swimming performance: apnea max test - 50 m long indoor pool - 3 to 5 times per week (3 for younger swimmers and 5 for older ones) in a 50 m swimming pool.	Lung function: In the EG, all ventilatory parameters were higher after RMT but the improvement was not significant. FEV1 and PEF were higher after RMT in the CG but the difference was not significant. Respiratory muscle strength: EG: after a month of RMT PImax value increased significantly (20.8%). PEmax value increased by 10.6% (i.e., strength of inspiratory and expiratory muscles improved). Significant differences in PImax (13.4%) and PEmax (23.1%) parameters in the CG were found. CG: after a month of regular training, no significant increase in the inspiratory parameters PImax were found. A small negative effect in the expiratory parameters PEmax that decreased. Large effect in all values of PImax and PEmax (pre, post and last) was found between EG and CG after first month (post: $d = 1.28$) and small effect after the second month (last: $d = .49$). There was a medium and large effect in post and last measurements (post: $d = .49$; last: $d = 1.19$) in PEmax parameters. Swimming performance: EG: able to swim for one inspiration increased by 11.36 meters (27.4%). Compared to the preliminary results, there was a significant difference in the follow up measurements, with a large effect size (9.45 meters). CG: there was a significant improvement in the average length, by 3.37

				CG: regular swimming training.		meters in the first month. Compared to the preliminary results, there was a significant difference in the follow up measurements after a month of additional respiratory training, with a large effect size. The length of the distance increased by 9.12 meters (20.7%).
Yañez-Sepulveda et al. 2021 / Chile	Randomized clinical trial	15 (EG, N = 9; CG, N = 6) / 100% / By Groups: EG = 15.5 ± 1.15y, sham control group (SCG): 14.7 ± 1.09y.	9 (moderate)	Inspiratory muscle training (4weeks). EG conducted two daily IMT training sessions with POWERbreathe Classic Competition® devices, with 30 dynamic inhalations to maximum capacity at an adjusted load/week according to the S-Index. EG load adjustment: 50% of the S-Index with load increased by 5% weekly. SCG load adjustment: 15% of the S-Index and maintained. If the maximum load was reached before four weeks, subjects maintained it until the end of the training period. Warm-up 30 maximum inhalations at 15% of the S-Index was performed by both groups.	Lung function: parameters/ spirometry - FEV1; FVC; PEF; relationship between FEV1 and FVC or Tiffeneau index (VEF1·FVC-1); FEF between 25% and 75% of the maximal flow (FEF25%-75%); and MVV. Respiratory Muscle Strength: (Maximum inspiratory muscle strength): POWERbreathe Kinetic K5® device – for maximum dynamic muscle strength (S-Index) and maximum inspiratory flow (MIF). Swimming performance: three freestyle swimming tests of 50-m, 100-m and 200-m, in an Olympic pool, once for three consecutive days	Lung function: Within group comparisons showed that only participants in the EG had a substantial increase of the S-Index (p=0.0003), the inspiratory flow (p=0.0008), VEF1 (p=0.007), FVC (p=0.0004), PEF (p=0.01), FEF25-75% (p=0.03), and MVV (p=0.0001). Respiratory muscle strength: Between-group comparison showed changes induced by IMT, with significant large effects in respiratory muscle strength (S-Index) (ES: 1.29 CI95%: 0.15 to 2.38; p=0.03) and MIF (ES: 1.31 CI95%: 0.16 to 2.42; p=0.02). Swimming performance: Large reduction in swimming times in all three tests: 50-m (ES: -2.29 CI95%: -3.86 to -0.68; p=0.002), 100-m (ES: -1.75 CI95%: -3.04 to -0.40; p=0.008) and 200-m (ES: -2.12 CI95%: -3.61 to -0.59; large effect; p=0.003). As the absolute improvement of the inspiratory musculature strength was greater, the swimming times in the 50-m tests (r= 0.72; p=0.003) and 100- m (r= 0.65; p=0.008) were also shorter. In addition, a higher maximum inspiratory flow was related to shorter swimming times in 50-m (r= 0.7; p=0.003) and 100-m (r= 0.62; p=0.01). The other respiratory parameters did not show any associations with swimming performance.

Espinosa-Mendez et al. 2020 / México	Randomized clinical trial	11 (EG, N = 6; CG, N = 5) / 36,36/ 14.3±1.2y.	8 (weak)	EG: RMT (MRFit) 20 minutes, two times a week for eight weeks incorporated into their usual training. CG: usual training without MRFit. MRfit protocol: 20-min 16 training sessions, for eight weeks, with a weighted load device for respiratory muscles made with tubes of four different calibers (own elaboration and previously validated).	Aerobic capacity: VO2max - treadmill ergospirometry.	Aerobic capacity: There were no significant differences in the VO2max a $p > 0.05$ for the two groups. The VO2max decreased in both groups, for the EG there was an average of 47.35ml/min, decreasing by 2.03ml/min, while in the CG the average in the second VO2max was 49.12ml min, a difference of 4.9 ml/min, with respect to its first sample (not statistically significant).
Lomax et al. 2017 / United Kingdom	Experimental non-randomized trial	33 (LOW, N = 18; HIGH, N = 15) / 54,54% / By Groups: LOW = 16±3y HIGH = 16±1y.	7 (weak)	Two groups based on their weekly training distance: low training distance group (LOW) or high training distance group (HIGH). Throughout the 6-week period, the coaches of the LOW and HIGH groups ensured the overall swimming training program was the same for both IMT and control swimmers. Intervention: Inspiratory muscle training was performed (POWERbreathe) twice daily, 7 d/wk for 6 weeks. Each session consisted of	Respiratory muscle strength: PImax and PEmax (pre (before the warm-up) and post each performance test). Swimming performance: maximum effort 100- and 200-m front crawl swim from a dive start in a counterbalanced order and on separate occasions within 1 week of each other. Swimming time was recorded per swim using a stopwatch, and in the case of the 200-m swim, per 100-m	Respiratory muscle strength: PImax and PEmax were similar between groups. PEmax was unaffected by IMT, but PImax did increase ($F = 105.142$, $p < 0.001$) after IMT. The largest improvement in PImax was seen in the LOW_{IMT} (98±4% IMT compliance) and HIGH_{IMT} (91±3% IMT compliance) groups ($F = 16.355$, $p < 0.001$, $d = 0.97-1.29$). Swimming performance: Pre-IMT 100- and 200-m swimming times were on average 14% faster (9.1 and 20.8 seconds, respectively) ($p < 0.001$) in the HIGH (pooled HIGH_{con} and HIGH_{IMT}) compared with LOW (pooled LOW_{con} and LOW_{IMT}) group swimmers. IMT improved 100-m ($F = 14.455$, $p < 0.001$, power = 0.954) and 200-m ($F = 21.108$, $p < 0.001$, power = 0.993) swimming times (and hence velocity) in the LOW_{IMT} group (100 m: $d = 0.32$; 200 m: $d = 0.64$) but not the HIGH_{IMT}, LOW_{con}, or HIGH_{con} groups. One hundred and 200-m swimming times were slower after

				30 breaths at an intensity equivalent to 50% P _{lmax} . Participants were instructed to periodically increase the load on the inspiratory muscle trainer so that 30 breaths could only just be completed.	partial also. Clean swimming velocity and SR were recorded per 100- and 200-m swim (Finis stopwatch with base count 3 function) using a 12.5-m central pool zone and expressed per 100-m partial of the 200-m swim.	IMT in HIGH _{IMT} and HIGH _{con} , respectively ($p \leq 0.05$; 100 m: $d = 0.65$; 200 m: $d = 0.59$). The first and second 100-m partials of the 200 m differed between the HIGH and LOW groups ($F = 10.844$, $p = 0.003$, power = 0.889). The first 100-m ($d = 0.39$) and second 100-m ($d = 0.24$) partials were faster after IMT in the LOW _{IMT} group ($p \leq 0.05$). The first 100-m ($d = -0.58$) and second 100-m ($d = -0.58$) partials were slower ($p \leq 0.05$) after the intervention in the HIGH _{con} group. The improvement in P _{lmax} post-IMT in the LOW _{IMT} group was not correlated with the change in 100- or 200-m swimming times pre- and post-IMT ($p > 0.05$).
Shei R et al. 2016 / USA	Double-blind, parallel- group experimental design	24 (EG 1, N = 8; EG 2, N = 8; CG, N = 8) / 50% / 19.9 ± 2.6y.	7 (weak)	EG: Group 1: combined swim training (ST) with flow-resistive IMT set at 80% sustained MIP with progressively increased work-rest ratios until task failure for 3 days/week (ST+IMT, n.=8) EG: Group 2: ST with sham-iMT (ST+Sham-IMT, n.=8), or CG: Group 3: (ST only, n.=8).	Lung function (Spirometry): RLV and TLC. Respiratory muscle strength: MIP, sustained maximal inspiratory pressure (SMIP).	Lung function: No significant differences ($P > 0.05$) were observed between the ST+Sham-iMT and ST only groups at baseline and at the end of the 12-week study period, in: FVC, FEV1, RLV and TLC. No significant changes ($P > 0.05$) were observed within groups following the training period: - except FEV1 within the ST+iMT group increased significantly ($P = 0.001$, 95% CI 0.19-0.68 L/s) at the end of the 12-week study period compared to baseline (% Δ , +14.5%). Respiratory muscle strength: Significant increases ($P < 0.05$) in several measures were observed in the ST+IMT group (at the end of the 12-week study period compared to baseline) in MIP (% Δ , +90.0%) and SMIP (% Δ , +49.2%).
Cunha et al. 2019/ Portugal	Randomized controlled trial	29 (EG, N=17; CG, N=12) / 31,25% / MD: EG = 15y; CG=14y.	13 (good)	EG: additional IMT program described as "RMT" at high intensity (50% of MIP). Participants periodically increased the load which allowed only 30 inspiratory maneuvers to be completed.	Swimming performance: time taken to complete 200m time trial (TT).	Swimming performance: EG and CG had an increase in FINA points, with mean difference changes of 30 (confidence interval: -0,60) and 19 (confidence interval: 12, 27), respectively. However, the training protocol failed to show significant differences between groups ($P = .271$) on swimming performance. Respiratory muscle strength: No significant differences ($P = .914$) were found between groups after

				CG: IMT intervention at a low training intensity (15% of MIP), and maintained the initial inspiratory load for the whole intervention. IMT: POWERbreathe Plus PB-2002 pressure threshold device, 2 cycles of 30 inspiratory efforts each, 5days/wk, for 12 weeks before swimming training.	Respiratory muscle strength (Inspiratory): MIP Lung function: Spirometry.	intervention. Within groups, IMT showed an improvement in MIP values with mean difference changes of 19.6 (P<.001) and 17.9 (P=.036) in EG and CG, respectively. Lung function: No significant differences were found between groups after the 12 weeks of IMT for FVC (P=.262), FEV1 (P=.265) and PEF (P=.270). A modest increase in FVC and FEV1 for the EG was found, with mean difference changes of 0.1 L, reaching significance (P=.011) for FVC but not for FEV1 (P=.061).
Tan et al. 2023 / China	Randomized controlled trial	43 (EG, N=20; CG, N=23) / 100% / By Groups: EG = 21.21±0.61y; CG = 21.26±0.74y.	8 (weak)	EG: standard training with IMT leveraging the capabilities of the Power Breather Plus device - for six weeks. IMT program: 15–20 min of training per session with three sets of 30 inhalations each. 2) CG: followed regular swimming training.	Swimming performance: time of 50 m freestyle, number of breaths in 50 m freestyle, distance before first breath in freestyle, time of 100 m freestyle; Respiratory muscle strength: MIP, MIF, and MIC. Lung function: spirometry - VC	Swimming performance: 50 m freestyle swim time: CG had a slight decrease from an average of 42 s to 40.4 s (p = 0.28); 0 EG showed a significantly greater decrease from an average of 39.6 s to 35.4 s (p = 0.0018). The number of breaths taken in the 50 m freestyle was not significant in the CG (15.73 vs. 15.75; p = 0.99), but significantly reduced in EG (11.45 to 7.85; p = 0.006). The distance before taking the first breath in the freestyle swim decreased slightly for the CG (31.34 m vs. 29.25 m; p = 0.39), whereas it increased significantly for the EG (27 m to 30.95 m; p = 0.013). 100 m freestyle swim time: CG had a small decrease (from 121.47s to 114.65s; p = 0.203), while the EG had a considerable decrease (from 112.25s to 102.3s; p = 0.004). Respiratory muscle strength: MIP: significant improvements were found in the EG starting on the second week (p<0.01), with an additional significant increase between the second and fourth week (p<0.01). CG showed modest progress (p = 0.05 at the sixth week versus pre-training levels). At the end of six weeks, MIP for the EG went from 117.70±14.83 to 162.87±10.77, while the CG went from 126.61±20.69 to

						144.19±16.14. MIF: EG had significant improvements beginning the second week ($p<0.01$) while CG only had it beginning the fourth week ($p = 0.03$). After six weeks, MIF rose from 5.97 ± 0.84 to 8.52 ± 0.83 in the EG and from 6.51 ± 0.89 to 7.54 ± 0.99 in the CG. MIC: Both groups had an upward trajectory every two weeks, but EG had significant increases from the second week ($p<0.01$), while CG only had them by the sixth week. Post training, MIC increased in EG from 5.97 ± 0.84 to 8.52 ± 0.83, and from 2.08 ± 0.76 to 3.34 ± 0.80 in CG. Lung function: No significant change was found in VC in CG compared to pre-training levels. EG had a substantial increase by the sixth week of training ($p = 0.01$), raising their VC from a baseline of 4483.42 ± 673.12 to 5048.48 ± 651.88.
Ando et al. 2020/ Japan	Randomized controlled trial	19 (EG, N=10; CG, N=9) / 100% / By Groups: EG = $19.3\pm0.1y$; CG = $19.3\pm0.1y$.	10 (moderate)	EG: 6-week inspiratory resistive training program + their usual swimming and strength training. CG: continued their usual swimming and strength training only. Protocol: Inspiratory muscle training device (POWERbreathe) was used for inspiratory resistive training, with maximum inspirations at a load resistance of 50% of their P_Imax value. Sessions included 30 maximum inspirations, twice a day, six days/week.	Respiratory muscle strength (P_Imax): was measured using a computerized spirometer system with a handheld mouth pressure meter.	Respiratory Muscle Strength: P_Imax increased significantly in both groups after 6 weeks. However, the relative change in P_Imax from baseline to 6 weeks later was significantly greater in the EG than in the CG. Baseline P_Imax at 15%, 45% and 75% of the P_Imax were 20.8 ± 2.9 cmH₂O, 62.4 ± 8.7 cmH₂O and 104.0 ± 14.5 cmH₂O, respectively, in the CG, and 19.3 ± 2.7 cmH₂O, 58.0 ± 8.1 and 96.6 ± 13.5 cmH₂O, respectively, in the EG. The inspiratory mouth pressures at 15%, 45% and 75% of the P_Imax after the 6-week training program were 23.3 ± 3.3 cmH₂O, 69.8 ± 10.0 cmH₂O, and 116.3 ± 16.7 cmH₂O, respectively, in the CG, and 24.4 ± 3.4 cmH₂O, 73.2 ± 10.1 cmH₂O, and 122.0 ± 16.8 cmH₂O, respectively, in the EG.

Wilson et al. 2013 / United Kingdom	Randomized controlled cross over trial	15 / 60% / 21.2±1.6	10 (moderate)	Randomly allocated weekly to one of four warm-up protocols for four consecutive weeks. Protocol 1: Standard swimming warm-up of 2500 m (100×25 m lengths), with a mix of all four strokes, leg-only work, arm-only work, and underwater work. Protocol 2: Respiratory muscle-specific warm-up (Powerbreathe): 2 sets of 30 inspirations at 40% of maximal inspiratory muscle pressure at 40% load to prevent fatigue. Protocol 3: protocol 1, followed by sham IME warm-up with a resistance load equal to 15% maximal inspiratory muscle pressure. Protocol 4: protocol 1, followed by IME warm-up (protocol 2).	Swimming performance: 100 m freestyle sprint time-trial time following warm-up in a 25 m (short-course) pool. Respiratory muscle strength: MIP and MEP Lung function: Spirometry: FVC, FVC per cent predicted, FEV1/FVC ratio, ratio percent predicted, peak flow (PEF), PEF percent predicted.	Swimming performance: There were significant differences between the four different warm-up protocols and the resulting 100 m freestyle times. The fastest protocol was swimming plus IME warm-up with a 100 m time of 57.05 s. Protocol 4 was significantly faster than both protocol 2 (Mean difference=1.18s, 95% CI 0.44 to 1.92, p<0.01) and protocol 1 (Mean difference=0.62s, 95% CI 0.001 to 1.23, p=0.05). Protocol 4 was faster than protocol 3, but the difference was not statistically significant (mean difference=0.33 s, 95% CI -0.44 to 1.11, p=1.00). Protocol 2 was significantly faster than protocol 3 (Mean difference=0.85 s, 95% CI 0.05 to 1.65, p=0.035). Respiratory muscle strength: There were no significant differences in this variable or in physiological parameters between any of the warm-up protocols. Lung function: There were no significant differences in this variable or in physiological parameters between any of the warm-up protocols.
Jakubovskis et al. 2024 / Latvia	Exploratory study	31 (EG=15; CG= 16)/ both male and female / By Groups: EG=16.15 ±2.4y; CG =16.5 ±2.0y.	9 (moderate)	Participants were reassessed after four weeks. CG (n=16): Regular training without changes to breathing techniques.	Lung function (Spirometry): FVC, PIF and PEF. Swimming performance: world aquatic (WA) points - 100-m competition	Lung function: After four weeks, EG showed significant improvements in FVC (↑ 4%–6%, p = 0.02) and PIF (↑ 24%–34%, p = 0.001). PEF increased slightly (↑ 6%) but without statistical significance (p = 0.46). The CG showed no significant changes in any of the respiratory measures.

				EG (n=15): Regular training but added modified breathing exercises: reducing inhalation frequency and gradually increasing breath-holding during swimming.		Swimming performance: The EG improved their WA points by 6%–8% ($p = 0.001$), indicating enhanced performance after the intervention. The CG showed no change.
Troncoso-Galleguillos et al. 2024 /Chile.	Randomized Controlled Trial	14 (EG=7; CG=7) / 71,43% (n=10) / By groups: EG: $17.1 \pm 2.2y$; CG= $16.0 \pm 1.4y$.	9 (moderate)	Both groups maintained usual swimming training. However, EG completed 36 sessions of respiratory muscle training over three weeks—two daily sessions of 30 breaths at 70% of MIP using the Powerbreathe® device.	Respiratory muscle strength: PImax. Lung function (Spirometry): FVC, FEV1, FEV1/FVC ratio, PIF, and PEF. Aerobic capacity: VO2max. Swimming performance: 200-meter freestyle test in a 25-meter heated pool (time, number of strokes, and number of breaths).	Respiratory muscle strength: A significant interaction effect was found for PImax ($p = 0.0115$) with a large effect size ($\eta^2 = 0.4254$). Post hoc analysis showed a significant increase in PImax after the intervention in the EG group ($p = 0.0010$). No differences were observed in CG. Lung function: No significant effects of the intervention were found for FVC, FEV1, FEV1/FVC ratio, PEF, or PIF. Aerobic capacity: No effects of the intervention were observed in the ergospirometric (cardiopulmonary exercise) variables. Swimming performance: No significant differences were found in split time ($p = 0.3347$, $\eta^2 = 0.0734$), number of strokes ($p = 0.8747$, $\eta^2 = 0.0169$), or number of breaths ($p = 0.7980$, $\eta^2 = 0.0247$) during the swimming test.

95% CI = 95% Confidence Interval; CG = Control Group; EG = Experimental Group; EMF = Expiratory Muscle Fatigue; EMT = Expiratory Muscle Training; FEF = Forced Expiratory Flow; FEV = Forced Expiratory Volume; FEV1 = Forced Expiratory Volume in 1 second; FVC = Forced Vital Capacity; HR = Heart Rate; HR – Hazard Ratio; IC = Inspiratory Capacity; IMF = Inspiratory Muscle Fatigue; IMR = Inspiratory Muscle Training; IRV = Inspiratory Reserve Volume; MD – Median; MEP = Maximal Expiratory Pressure; MIC = Maximum Inspiratory Capacity.; MIF = Maximum Inspiratory Flow; MIP = Maximal Inspiratory Pressure; MV = Minute Ventilation; MVV = Maximum Voluntary Ventilation; N/A – Not Applicable; OR = Odds Ratio; p = p value; PaO_2 / FiO_2 = Partial Pressure Of Oxygen/Fraction Of Inspired Oxygen; PEF = Peak Expiratory Flow; PEmax – Maximal Expiratory Pressure; PHR = Peak Heart Rate; PImax = Maximal Inspiratory Pressure; RCT – Randomized Controlled Trial; RERmax = Respiratory Exchange Ratio at Maximal Exercise; RLV = Residual Lung Volume; RMET = Respiratory Muscle Endurance Training; RMST =

Respiratory Muscle Strength Training; SR = Stroke Rate; SVC = Slow Vital Capacity; TLC = Total Lung Capacity; VC = Vital Capacity

