

Supplementary Material 1: Details of the specific search criteria performed in Medline and EMBASE.

((Cardiopulmonary exercise test*) OR (cardiopulmonary exercise) OR (exercise test*)) AND ((idiopathic pulmonary fibrosis) OR (pulmonary fibrosis) OR (interstitial lung disease) OR (idiopathic interstitial pneumonia) OR (Cryptogenic fibrosing alveolitis) OR (fibrosing alveolitis) OR (Connective tissue disease-related interstitial lung disease) OR (Connective tissue disease-associated interstitial lung disease) OR (rheumatoid lung) OR (systemic sclerosis) OR (scleroderma) OR (polymyositis) OR (myositis)) AND ((cohort studies) OR (longitudinal studies) OR (case-control studies) OR (follow-up studies) OR (retrospective studies) OR (prospective studies) OR (incidence) OR (mortality) OR (follow-up studies) OR (prognos*) OR (predict*) OR (course) OR (prognostic) OR (prognosis) OR (progression) OR (future) OR (development) OR (outcome) OR (treatment outcome) OR (disease-free survival) OR (treatment failure) OR (morbidity) OR (mortality) OR (survival rate) OR (survival) OR (cause of death) OR (survival analysis)).

Supplementary Material 3. Details of inter-reviewer agreement during initial title and abstract review for eligible articles.

Details of agreement between reviewers for the title and abstract review

Reviewer 1	Reviewer 2		Totals
	Include	Exclude	
Include	9	20	29
Exclude	0	629	629
Totals	9	649	658

Number of observed agreements: 638 (97.0% of the observations)

Number of agreements expected by chance: 620.8 (94.35% of the observations)

Kappa = 0.462 (95% confidence interval 0.267-0.658)

SE of kappa= 0.100

The strength of agreement is considered to be ‘moderate’.

Discordance for 20 studies was due to a single non-clinically trained reviewer choosing to include questionable studies for consideration (all of which were easily resolved through discussion and subsequently excluded). These studies are referenced below.

This resulted in a total of 18 papers proceeding to full text review.

20 studies in which there was discordance but were ultimately excluded after discussion:

Meijs J, Schouffoer AA, Ajmone Marsan N, Kroft LJ, Stijnen T, Ninaber MK, Huizinga TW, Vliet Vlieland TP, de Vries-Bouwstra JK. Therapeutic and diagnostic outcomes of a standardised, comprehensive care pathway for patients with systemic sclerosis. RMD Open. 2016 Mar 15;2(1):e000159. doi: 10.1136/rmdopen-2015-000159. PMID: 27042333; PMCID: PMC4800807.

No longitudinal data.

Meijs J, Schouffoer AA, Ajmone Marsan N, Stijnen T, Putter H, Ninaber MK, Huizinga TW, de Vries-Bouwstra JK. A prediction model for progressive disease in systemic sclerosis. *RMD Open*. 2015 Dec 1;1(1):e000113. doi: 10.1136/rmdopen-2015-000113. PMID: 26688749; PMCID: PMC4680735.
Unable to differentiate ILD population

Troy L.K., Young I.H., Lau E.M.T., Corte T.J.
Exercise pathophysiology and the role of oxygen therapy in idiopathic interstitial pneumonia. *Respirology*. 21 (6) (pp 1005-1014), 2016.
Review article

Rosato E., Romaniello A., Magri D., Bonini M., Sardo L., Gigante A., Quarta S., Digiulio M.A., Viola G., Di Paolo M., Jacoangeli F., Baiocchi P., Salsano F., Palange P. Exercise tolerance in systemic sclerosis patients without pulmonary impairment: Correlation with clinical variables. *Clinical and Experimental Rheumatology*. 32 (Supplement86) (pp 103-108), 2014.
Pulmonary vasculopathy in CTD population

Stamm A, Saxer S, Lichtblau M, Hasler ED, Jordan S, Huber LC, Bloch KE, Distler O, Ulrich S. Exercise pulmonary haemodynamic predict outcome in patients with systemic sclerosis. *Eur Respir J*. 2016 Dec;48(6):1658-1667. doi: 10.1183/13993003.00990-2016.
Pulmonary vasculopathy in CTD population

Shakespeare J., Archer L., Hastings R., Woodhead F., Helm E., Hughes R., Parr D.
Relationship between the incremental shuttle walk test (ISWT) and full cardiopulmonary exercise testing (CPET) in patients with idiopathic interstitial pneumonia (IIP). *European Respiratory Journal*. Conference: European Respiratory Society Annual Congress 2014. Munich Germany. 44 (SUPPL. 58) 2014.
Conference Abstract

Liu J., Huang D. Ventilatory efficiency and exercise capacity during exercise in the patients with idiopathic pulmonary fibrosis. *European Respiratory Journal*. Conference: European Respiratory Society Annual Congress 2014. Munich Germany. Conference 44 (SUPPL. 58).
Conference Abstract

Minimal clinically important investigations in systemic sclerosis.
Meijs J., De Vries J., Ajmone N., Ninaber M., Huizinga T., Schouffoer A.
Clinical and Experimental Rheumatology. Conference: 3rd Systemic Sclerosis World Congress. 32 (2 SUPPL. 81) (pp S79), 2014.
Conference abstract

Lee R., Lawless G., Eigenheer S., Keane M.P., McNicholas W.T. Predictors of exercise limitation in patients with idiopathic pulmonary fibrosis. *Irish Journal of Medical Science*. Conference: Irish Thoracic Society Annual Scientific Meeting 2012. Limerick Ireland. 181 (SUPPL. 10) (pp S435), 2012.
Conference Abstract

Bhatt D.V., Cho J., Kocheril A. Submaximal cardiopulmonary exercise testing for

unexplained dyspnea. *Journal of Cardiac Failure*. Conference: 16th Annual Scientific Meeting of the Heart Failure Society of America, HFSA 2012. 18 (8 SUPPL. 1) (pp S99) Conference Abstract

Triantafillidou C., Lyberopoulos P., Kolilekas L., Kagouridis K., Gyftopoulos S., Sotiropoulou C., Kotanidou A., Karakatsani A., Papiris S The prognostic significance of cardiopulmonary exercise in IPF.. *European Respiratory Journal*. Conference: European Respiratory Society Annual Congress 2011. Amsterdam Netherlands. 38 (SUPPL. 55). Conference Abstract

Dumitrescu D., Gerhardt F., Viethen T., Baldus S., Moinzadeh P., Hunzelmann N., Rosenkranz S. Prognostic relevance of cardiopulmonary exercise testing in the long-term follow-up of scleroderma patients with and without PAH. *Chest*. Conference: CHEST 2016. United States. 150 (4 Supplement 1) (pp 1184A), 2016. Conference Abstract

Priegnitz C., Hagemeyer L., Kietzmann I., Richter K., Randerath W. Cardiopulmonary exercise testing in interstitial lung disease. *European Respiratory Journal*. Conference: European Respiratory Society Annual Congress 2015. Amsterdam Netherlands. 46 (SUPPL. 59) Conference Abstract

Dalabih M.R., Bernardo R.J., Hansen L., Tafich-Rios C.A., Rischard F. Invasive cardiopulmonary exercise testing characterizes a unique phenotype of patients with interstitial lung disease and pulmonary hypertension similar to patients with pulmonary arterial hypertension. *American Journal of Respiratory and Critical Care Medicine*. Conference: American Thoracic Society International Conference, ATS 2015. Denver, CO United States. Conference Publication: 191 Conference Abstract

Layton A.M., Armstrong H.F., Basner R.C., Lederer D.J., Arcasoy S.M. Cardiopulmonary exercise testing helps predict one-year transplant-free survival in patients with interstitial lung disease. *American Journal of Respiratory and Critical Care Medicine*. Conference: American Thoracic Society International Conference, ATS 2015. Denver, CO United States. Conference Publication: 191 Conference Abstract

Manali E.D., Lyberopoulos P., Triantafillidou C., Kolilekas L.F., Sotiropoulou C., Milic-Emili J., Roussos C., Papiris S.A. MRC chronic Dyspnea Scale: Relationships with cardiopulmonary exercise testing and 6-minute walk test in idiopathic pulmonary fibrosis patients: A prospective study. *BMC Pulmonary Medicine*. 10, 2010. Article Number: 32. No longitudinal data

Cuomo G., Santoriello C., Polverino F., Ruocco L., Valentini G., Polverino M. Impaired exercise performance in systemic sclerosis and its clinical correlations. *Scandinavian Journal of Rheumatology*. 39 (4) (pp 330-335), 2010.

No longitudinal data

Ferrazza A.M., Martolini D., Valli G., Palange P. Cardiopulmonary exercise testing in the functional and prognostic evaluation of patients with pulmonary diseases. *Respiration*. 77 (1) (pp 3-17), 2009.

Review

Zabinska-Plazak E., Wojas-Pelc A., Podolec-Rubis M., Plazak W., Tracz W. Cardiopulmonary exercise test in patients with systemic sclerosis. <Zastosowanie spiroergometrii u chorych z twardzina ukladowa.> *Przegląd Dermatologiczny*. 92 (1) (pp 29-35), 2005.

Article in Polish

Anderson S.D., Bye P.T.P. Exercise testing in the evaluation of diffuse interstitial lung disease. *Australian and New Zealand Journal of Medicine*. 14 (5 SUPPL. 3) (pp 762-768), 1984. Date of Publication: 1984.

No longitudinal data

Supplementary Material 4. Details of inter-reviewer agreement during QUIPS risk-of-bias assessment of articles taken forward to full data extraction

Details of agreement between reviewers for the QUIPS assessment of bias.

		Reviewer 2			Totals
Reviewer 1		Low	Moderate	High	
	Low	18	4	0	22
	Moderate	6	20	3	29
	High	0	4	23	27
Totals		24	28	26	78

Number of observed agreements: 61 (78.21% of the observations)

Number of agreements expected by chance: 26.2 (33.56% of the observations)

Kappa= 0.672

SE of kappa = 0.071

95% confidence interval: From 0.534 to 0.810

The strength of agreement was considered to be 'good'.

Weighted kappa 0.748: This takes into consideration that a low-moderate observed assessment of bias between the two reviewers is better agreement than a low-high observation.