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CORRESPONDENCE

Standards for diagnostic spirometry within-session repeatability in primary care

Dear Sirs,

We were very interested to read the correspondence from Gruffydd-Jones *et al*. in the most recent issue of the *PCRJ*.[1] We thank them for their request that we should provide further clarification regarding within-session repeatability when performing diagnostic spirometry.

The 2009 Spirometry Standards document to which they refer[2] recommended 150 ml as the limit for within-session repeatability for FEV_1 and FVC, in accordance with American Thoracic Society (ATS) and European Respiratory Society (ERS) standards. Gruffydd-Jones *et al*. favour a target of 100 ml.[1] However, apart from reference to previous correspondence from Fletcher and Loveridge[3] (citing a sample of 10 subjects), and Cooper,[4] they provide no published evidence to support their opinion. The ATS/ERS guidelines[5] have not been updated (the 150 ml limit remains current), nor has there been an update to the British Thoracic Society (BTS)/Association for Respiratory Technology and Physiology (ARTP) guideline published in 1994 which suggested 100 ml.[6]

Nevertheless, we note that Gruffydd-Jones *et al.* point out that the GOLD guideline recommendation in 2011[7] moved to 100 ml. We have followed-up this point. In fact, this is apparently a typing error (personal communication from Jorgen Vestbo, Chair GOLD Science Committee); on page 12, the guidance suggests "5% or 100 mL whichever is the greater". In effect, if the patient has an FEV_1 or FVC of more than 2 litres the 5% guidance takes precedence and makes the 100 ml reading redundant.

In primary care we aim to achieve comparable standards to our specialist colleagues. Ferguson *et al*., in their consensus statement from the National Lung Health Education Program (NLHEP), suggested a rating system (A-F) for assessing quality of spirometry.[8] Grades A and B required a minimum difference of 100 and 101-150 ml respectively, with Grade C requiring 151-200 ml difference between the best two FEV_1 and FVC readings. Grade D required only one acceptable manoeuvre but with FEV_1 values within 200 ml, and Grade F signified no acceptable manoeuvres.

Three recent publications have utilised a similar quality control grading system, involving over 55,000 spirometry tests by specialists and in primary care, and demonstrate quite clearly that the 100 ml limit suggested by Gruffydd-Jones and colleagues is unrealistic.

Enright *et al*.[9] studied 13,599 good quality spirometry tests by specialists at the World Trade Center, 80% of which achieved grade A and B standards (within 200 ml). Leuppi *et al*. considered 29,817 consecutive spirometry tests that had taken place in primary care and found that 41% achieved grade A and B (within 200 ml) and 11.8% had the lowest grade F.[10] Finally, recently published data from the European Spirometry Tent performed at ERS meetings,[11] which reported on 12,448 tests of which 10,395 (83.5%) were termed acceptable (only grade F rejected), showed that the overall standard for grade A and B in this specialist environment was 30.8% (with the best results being undertaken in 2004 in Glasgow, but still only achieving 51.4%).

As the available evidence suggests that our specialist colleagues find it difficult to achieve repeatability within 200 ml in 50% of tests, it is inappropriate to suggest setting a 100 ml standard for within-session repeatability in general practice. We therefore maintain our recommendation – i.e. that spirometry within-session repeatability should be within 150 ml in keeping with ATS/ERS guidance, until justified by evidence from specialists to the contrary.

However, we strongly support efforts like the European Spirometry Driving License project aimed at improving standards of measurements, which will in the future enable the adoption of stricter quality criteria in general as well as in specialist practice, and we look forward to the publication of high quality evidence demonstrating that this level of measurement is achievable.

***Mark L Levy,[a] Philip H Quanjer,[b] Rachel Booker,[c] Steve Holmes,[d] Iain Small[e]**

[a] Senior Clinical Research Fellow, Allergy and Respiratory Research Group, Centre for Population Health Sciences: GP Section, University of Edinburgh; Editor Emeritus: *Primary Care Respiratory Journal*

[b] Professor Emeritus of Physiology, Department of Pulmonary Diseases and Sophia Children's Hospital, Erasmus Medical Centre, Erasmus University, Rotterdam, The Netherlands

[c] Independent specialist respiratory nurse and freelance medical writer

[d] General Practitioner, Shepton Mallet, Somerset, UK; Associate Dean (GP Medical Education) Severn Deanery, Bristol, UK; PCRS-UK Education Lead

[e] General Practitioner, Peterhead Health Centre, Peterhead, Aberdeenshire, UK; Honorary Lecturer, Centre for Academic Primary Care, University of Aberdeen, UK; Chair of the PCRS-UK Executive Committee

*Correspondence: marklevy@animalswild.com

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Diagnostic pathways for interstitial lung diseases in primary care

Dear Sirs,

Interstitial lung diseases (ILDs) are characterised by inflammation or fibrosis of the lung parenchyma.[1] Because of their low incidence and non-specific symptoms, ILDs are difficult to recognise, and this may cause diagnostic delay.[2] We were very interested to read the review by Gulati on the diagnosis of ILDs published in the *PCRJ* last year,[3] in which he concluded that, "General practitioners can prevent diagnostic delays by recognising clinical clues, reviewing relevant exposures, and uncovering the presence of possible connective tissue disease, as well as ordering HRCT chest scans and pulmonary function tests if possible." However, the diagnostic pathway for ILDs in primary care has hardly been studied. We would therefore like to comment on our recent work on the clinical presentation of ILDs, general practitioners' (GPs') diagnostic considerations, and delays between the initial GP consultation and referral to a medical specialist.

Using two Dutch primary care research databases,[4,5] we identified 32 ILD patients fulfilling our inclusion criteria (i.e. data available preceding the diagnosis and referral to a medical specialist who made the formal ILD diagnosis between 1995 and 2005). Twenty-three patients (75%) had been diagnosed with sarcoidosis, others with idiopathic pulmonary fibrosis (n=5), extrinsic allergic alveolitis (n=2), pulmonary fibrosis in scleroderma (n=1), and bronchiolitis obliterans organising pneumonia (n=1). Slightly more men (56%) than women were included and the mean age at diagnosis was 48 years (range 22–80 years).

During the first GP consultation two-thirds reported pulmonary symptoms and 44% reported systemic symptoms such as fatigue and fever (see Table 1). Nine patients presenting with joint pain or erythema nodosum were later diagnosed with sarcoidosis. Patients reported various other symptoms such as common cold symptoms, myalgia, gastro-intestinal complaints, nervous-functional complaints, visual disorders (in sarcoidosis), and Raynaud's syndrome (in scleroderma). In patients presenting with pulmonary symptoms, common initial working diagnoses were airway infections (n=13), asthma/COPD (n=5), and hyperventilation (n=5). Interestingly, heart failure (n=5) and pulmonary embolism (n=4) was suspected in patients who presented with dyspnoea. Rheumatic fever and arthritis were common working diagnoses in patients presenting with joint pain (n=5).

Before referral to a medical specialist, patients had a mean of four GP consultations (range 1-12). Mean time to referral was 13 weeks (range 0 days – 19 months). Within four months, 75% were referred and only three patients were referred after more than a year. Patients presenting with joint pain or erythema nodosum (n=9) were referred relatively soon (mean time to referral 18 days versus 4 months in other patients). Eight of them were referred to a rheumatologist or internist. In contrast, almost all patients who presented with pulmonary or systemic symptoms were referred to a chest physician (83%). Four ended up seeing an internist, ophthalmologist or cardiologist, which may have caused a significant diagnostic delay.

Table 1. Symptoms presented by patients diagnosed with interstitial lung disease (n=32)

Symptoms	First Visit N (%)	All Visits N (%)
Pulmonary	21 (66%)	22 (69%)
Dyspnoea	12 (38%)	15 (47%)
Cough	10 (31%)	12 (31%)
Thoracic pain	4 (13%)	4 (13%)
Sputum	3 (9%)	5 (16%)
Crepitations	4 (13%)	9 (28%)
Prolonged expiration	0 (0%)	1 (3%)
Wheezing	0 (0%)	2 (6%)
Systemic	14 (44%)	21 (66%)
Fatigue	9 (28%)	15 (47%)
Fever	3 (9%)	10 (31%)
Weight loss	2 (6%)	4 (13%)
Night sweats	0 (0%)	1 (3%)
Joint pain	7 (22%)	7 (22%)
Erythema nodosum	1 (3%)	4 (12%)
Other	17 (53%)	20 (63%)

The diagnostic delay of ILDs in general practice should be seen in the light of the relatively common symptoms and signs with which most patients initially present – i.e. dyspnoea, cough, crepitations, thoracic pain, fatigue, fever. Understandably, more common diseases such as respiratory infections, asthma and COPD are considered first, and GPs rightfully choose "watchful waiting" because symptoms such as these are often self-limiting. This protects patients against undue, costly and potentially risky diagnostic tests, and may even reduce diagnostic delay caused by referral to the wrong specialist. As Gulati advises,[3] if symptoms persist and advanced diagnostic services are available, a GP can then order a non-invasive HRCT scan to identify an ILD, and refer as appropriate. As most ILDs are very rare, a definitive diagnosis by a GP is not feasible and referral to the appropriate specialist is warranted. The role of general practice could be strengthened by specifying those clinical characteristics that make ILDs stand out from diseases like asthma or COPD on initial presentation and in the first weeks of follow-up, although we acknowledge that this may be difficult.