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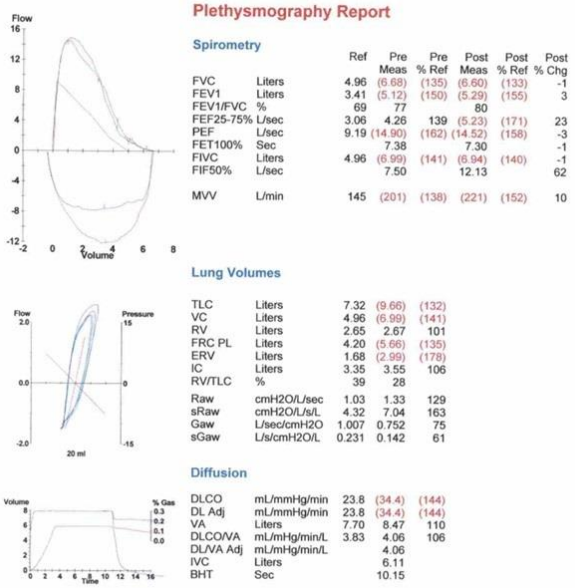
April 2024 Medical Image of the Month: Wind Instruments Player Exhibiting Exceptional Pulmonary Function

Figure 1. Representative view from computed tomography (CT) scan (axial plane) showing clear lungs.



Plethysmography Report

Spirometry

		Ref	Pre Meas	Pre % Ref	Post Meas	Post % Ref	Post % Chg
FVC	Liters	4.96	(6.68)	(135)	(6.60)	(133)	-1
FEV1	Liters	3.41	(5.12)	(150)	(5.29)	(155)	3
FEV1/FVC	%	69	77		80		
FEF25-75%	L/sec	3.06	4.26	139	(5.23)	(171)	23
PEF	L/sec	9.19	(14.90)	(162)	(14.52)	(158)	-3
FET100%	Sec		7.38		7.30		-1
FIVC	Liters	4.96	(6.99)	(141)	(6.94)	(140)	-1
FIF50%	L/sec		7.50		12.13		62
MVV	L/min	145	(201)	(138)	(221)	(152)	10

Lung Volumes

TLC	Liters	7.32	(9.66)	(132)
VC	Liters	4.96	(6.99)	(141)
RV	Liters	2.65	2.67	101
FRC PL	Liters	4.20	(5.66)	(135)
ERV	Liters	1.68	(2.99)	(178)
IC	Liters	3.35	3.55	106
RV/TLC	%	39	28	
Raw	cmH2O/L/sec	1.03	1.33	129
sRaw	cmH2O/L/s/L	4.32	7.04	163
Gaw	L/sec/cmH2O	1.007	0.752	75
sGaw	L/s/cmH2O/L	0.231	0.142	61

Diffusion

DLCO	mL/mmHg/min	23.8	(34.4)	(144)
DL Adj	mL/mmHg/min	23.8	(34.4)	(144)
VA	Liters	7.70	8.47	110
DLCO/VA	mL/mHg/min/L	3.83	4.06	106
DL/VA Adj	mL/mHg/min/L		4.06	
IVC	Liters		6.11	
BHT	Sec		10.15	

Figure 2. Pulmonary function testing results demonstrating exceptional pulmonary function.

A 64-year-old man was referred to our pulmonary clinic for evaluation of his pulmonary status. He had a 7-year history of rheumatoid arthritis and was treated initially with steroids and subsequently maintained on methotrexate and monthly adalimumab injections. The patient reported that his rheumatoid arthritis symptoms were controlled. He experienced no joint pain or morning stiffness at the time of evaluation. From a pulmonary perspective, he denied respiratory symptoms such as exertional shortness of breath, cough, wheezing, or chest tightness. He reported no limitations in physical activities. The patient has an occupational history of 45-years as a welder, with exposure to dust, metal fumes, benzene, and sulfur gas. The patient also has a 15 pack-year smoking history but quit 35 years ago.

A high-resolution chest CT (Figure 1) ordered by his rheumatologist showed normal lung parenchyma. The first pulmonary function test (PFT), conducted on the initial pulmonary clinic visit, revealed lung volumes significantly higher than the reference range. This is despite the patient's occupational history, smoking history, and the fact that he is currently on methotrexate and adalimumab therapy. The patient remained asymptomatic from a pulmonary standpoint on annual checkups. Three years later, a repeat PFT (Figure-2) demonstrated similar results. Further history revealed that the patient had regularly used wind instruments, including the saxophone and harmonica, since high school. Initially, he played at irregular intervals, but for the last 15 years, he consistently practiced 1-2 hours daily and performed weekly at local venues. Several studies have investigated the pulmonary effects of wind instrument playing, offering insights into the relationship between musical activities and respiratory function. Fiz *et al.* (1) found that maximum respiratory pressures were elevated in trumpet players. Munn *et al.* (2) reported on the pulmonary function of commercial glass blowers [2]. Barbenel *et al.* (3) explored mouthpiece forces during trumpet playing and Kahane *et al.* (4) evaluated the upper airway and larynx in professional bassoon players. Cossette *et al.* (5) examined chest wall dynamics during flute playing. Schorr-Lesnick *et al.* (6) studied pulmonary function in singers and wind-instrument players [6], and Navratil *et al.* (7) assessed lung function in wind instrument players and glass blowers. Borgia *et al.* (8) provided physiological observations on French horn musicians. While existing studies present conflicting findings on the impact of wind instrument playing on respiratory function, our case adds to the growing body of evidence suggesting a potential positive correlation between long-term wind instrument training and enhanced respiratory muscle strength.

This observation prompts further exploration and investigation into the field of pulmonary rehabilitation with the hope of uncovering therapeutic benefits for individuals with chronic pulmonary conditions.

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