

Nico A.M. Schellart^{1,2}, Wouter Sterk³¹ Biomedical Engineering and Physics, Academic Medical Center, University of Amsterdam,

Amsterdam, The Netherlands

² Foundation for Dive Research (SDR), Amsterdam, The Netherlands³ Dacodac, Zuidwolde, The Netherlands**Introduction:**

A well-fitting wetsuit exerts a pressure on the body that may influence spirometry. This pressure is expected to reduce the forced vital capacity (FVC) due to a hampered inspiration. Because the spirogram is expected to be shape invariant for the pressure effects of the diving suit, FVC, the forced expiratory volume during the first second of expiration (FEV₁), the peak expiratory flow (PEF) and the flow between 25 and 75% of FVC (FEF₂₅₋₇₅) should change with the same fraction. This study investigates the influence of a wetsuit on spirometric variables using age, suit thickness and suit type as the parameters.

Materials and Methods:

Spirometry (dry) was performed in 28 volunteers (12 women), aged 27-69 years.

Results:

The wetsuit (3.8 mm, range 2-7 mm) resulted in a change in FVC of -4.0% ($P = 2 \cdot E-08$), in FEV₁ of -3.6% ($P = 3 \cdot E-05$) and in PEF of -2.4% ($P = 0.03$); the FEF₂₅₋₇₅ may also diminish. The FEV₁/FVC ratio did not change. The decreases can be regarded as a quasi-ageing effect of about 3.5 years. No influence of age, suit thickness and suit type was found. Probably the study was underpowered to show the effects of these parameters.

Discussion: The wetsuit appears to impair ventilatory mechanics. Both the medical examiner and the diver should be aware that a too thick or too tight suit might be a potential pulmonary risk factor.

Keywords:

Lung mechanics, FVC, PEF, Suit thickness, Age