Preprint Series in Particles and Cosmos Physics

nº IPARCOS-UCM-23-008

INSTITUTO DE FÍSICA
DE PARTÍCULAS Y DEL COSMOS

IPARCOS

Inter-Rater Variability in the Evaluation of Lung Ultrasound in Videos Acquired from COVID-19 Patients

by Joaquin L. Herraiz, Clara Freijo, et al.

February 2023

Plaza de las Ciencias, 1 28040 Madrid, Spain

www.ucm.es/iparcos/

UNIVERSIDAD COMPLUTENSE MADRID

INSTITUTO DE FÍSICA
DE PARTÍCULAS Y DEL COSMOS

IPARCOS

Abstract

Lung ultrasound (LUS) allows for the detection of a series of manifestations of COVID-19, such as B-lines and consolidations. The objective of this work was to study the inter-rater reliability (IRR) when detecting signs associated with COVID-19 in the LUS, as well as the performance of the test in a longitudinal or transverse orientation. Thirty-three physicians with advanced experience in LUS independently evaluated ultrasound videos previously acquired using the ULTRACOV system on 20 patients with confirmed COVID-19. For each patient, 24 videos of 3 s were acquired (using 12 positions with the probe in longitudinal and transverse orientations). The physicians had no information about the patients or other previous evaluations. The score assigned to each acquisition followed the convention applied in previous studies. A substantial IRR was found in the cases of normal LUS (k = 0.74), with only a fair IRR for the presence of individual B-lines (k = 0.36) and for confluent B-lines occupying < 50% (k = 0.26) and a moderate IRR in consolidations and B-lines > 50% (k = 0.50). No statistically significant differences between the longitudinal and transverse scans were found. The IRR for LUS of COVID-19 patients may benefit from more standardized clinical protocols.

UNIVERSIDAD
COMPLUTENSE
MADRID