

## Algorithm for Quantification of Pulmonary Fibrosis in Chest X-Ray Exams

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**Abstract :** It is estimated that each year one death every 10 seconds (about 2 million deaths) in the world is attributed to tuberculosis (TB). Even after effective treatment, TB leaves sequelae such as, for example, pulmonary fibrosis, compromising the quality of life of patients. Evaluations of the aforementioned sequel are usually performed subjectively by radiology specialists. Subjective evaluation may indicate variations inter and intra observers. The examination of x-rays is the diagnostic imaging method most accomplished in the monitoring of patients diagnosed with TB and of least cost to the institution. The application of computational algorithms is of utmost importance to make a more objective quantification of pulmonary impairment in individuals with tuberculosis. The purpose of this research is the use of computer algorithms to quantify the pulmonary impairment pre and post-treatment of patients with pulmonary TB. The x-ray images of 10 patients with TB diagnosis confirmed by examination of sputum smears were studied. Initially the segmentation of the total lung area was performed (posteroanterior and lateral views) then targeted to the compromised region by pulmonary sequel. Through morphological operators and the application of signal noise tool, it was possible to determine the compromised lung volume. The largest difference found pre- and post-treatment was 85.85% and the smallest was 54.08%.

**Keywords :** algorithm, radiology, tuberculosis, x-rays exam

**Conference Title :** ICMNRE 2016 : International Conference on Medical Physics, Nuclear and Radiological Engineering

**Conference Location :** Prague, Czechia

**Conference Dates :** March 30-31, 2016