

ENGLISH	Instructions for Use regarding reading the ArtiQ.PFT output report ALL OF THESE INSTRUCTIONS FOR USE MUST BE READ CAREFULLY PRIOR TO CLINICAL USE	ENGLISH
---------	---	---------

This document is intended to give general guidance on how ArtiQ.PFT-reports should be read.

DESCRIPTION / INTENDED PURPOSE

The intended purpose of ArtiQ.PFT is to provide automated interpretation of pulmonary function tests (PFTs) to assist physicians in the diagnosis and follow-up of respiratory diseases. It is a standalone software-only medical device with no graphical user interface that can be used through an application programming interface (API) for the generation of ArtiQ.PFT reports. These reports are meant to supplement, and by no means substitute, any initial report(s) generated by PFT devices, and are not meant to be used as a replacement of the medical practitioner's interpretation.

INDICATIONS FOR USE, CONTRA-INDICATIONS AND PATIENT TARGET GROUP

ArtiQ.PFT can be used for subjects aged 5-90 years that have undergone pulmonary function testing. The analysis (disease probabilities) was validated on a population aged 27-83 years and should thus only be used in an adult population.

INTENDED USERS

The ArtiQ.PFT software is intended to be used by physicians, mainly pulmonologists.

PERFORMANCE CHARACTERISTICS

The software has a more accurate and faster pattern recognition (according to the international guidelines) than the average individual pulmonologist.

The software has higher diagnostic suggestion accuracy (based on highest disease probability) than the average individual pulmonologist.

WARNINGS

Careful attention should be paid to the probabilities for disease presence. Different diseases may be present with similar PFT patterns.

These reports are meant to supplement, and by no means substitute, any other available report (automated or manual).

PRECAUTIONS

The input data should be of sufficient quality according to the international guidelines (Graham 2019). ArtiQ.PFT reports are only reliable when the data is correctly submitted to the HTTP API. Verify the installation with tests before first use as instructed in the Installation Instructions.

RESIDUAL RISKS

The report content might not represent clinical reality if data input is incorrect or of insufficient quality (see precautions).

Highest probability of disease presence might not correspond to correct and/or only diagnosis as different diseases may be present with similar PFT pattern.

Reports might not be produced when input data is not submitted correctly to the HTTP API.

NOTICE TO THE USER

Any serious incident that has occurred in relation to ArtiQ.PFT should be reported to ArtiQ NV and the competent authority of the Member State in which the user and/or patient is established.

READING INSTRUCTIONS

ArtiQ.PFT reports consist of 4 main sections (see figure 1 for an example):

1. **Protocol:** a text description of the observed lung function pattern, based on calculations performed on submitted PFT parameters. ArtiQ.PFT calculates reference (predicted) values for each PFT parameter. For the spirometric indices, reference values are calculated per the Quanjer GLI-2012 equations (Quanjer 2012), while for transfer factor for carbon monoxide Stanojevic GLI-2017 equations (Stanojevic 2017) are used. The spirometric prediction equations for the 5–90-age range include appropriate age-dependent lower limits of normal. For parameters not described in the above 2 publications, equations published by Quanjer in 1993 are used. For static lung volume parameters GLI-2021 (Graham 2021) can be used (optional). In a second step, the test results are compared to predicted values. The resulting outcomes reported according to the international guidelines (Pellegrino 2005 or Stanojevic 2021).
2. **Analysis / Disease probabilities:** using PFT measurements and clinical information (such as age, BMI and smoking history) of the patient, the software describes an expected probability of disease: chosen among the 8 most common categories detectable with PFTs (Asthma, Chronic Obstructive Pulmonary Disease, Other Obstructive Diseases, Normal lung function, Interstitial lung disease, Neuromuscular disease, Pulmonary vascular disease, and Thoracic deformity). This feature is to be taken as a suggestion, as in daily clinical practice, doctors still need to further examine patients before giving and validating a final diagnosis. Disease probabilities are calculated using a predictive model that was trained using a machine learning algorithm (Topalovic 2019). That means that from a database with clinically validated known diseases, the software has learned how each disease look like and how to detect it. Once new data comes in, the algorithm checks how well the new data matches with different diseases (like fingerprint mapping). The output is the similarity with each of the 8 most common categories (7 diseases + healthy/normal lung function).
3. **Decision support:** based on the analysis, the disease with the highest predicted probability is highlighted.
4. **Further suggestions:** the software proposes a set of further clinical tests necessary for exploration and further validation of the suggested diagnosis provided by the analysis function.

ARTIQ

Patient ID: 75626668 Analyzed: 2019-08-22 14:08:56
 Age: 58 ♂ BMI: 28 Smoker: Yes

Protocol

Normal lung function. Tendency towards obstructive lung function. Reversibility test is not performed.
 Signs of small airways disease.
 Normal airway resistance.
 No signs of hyperinflation. No signs of airtrapping.
 Normal diffusion capacity.

Disease probability:

Disease	Probability
Asthma	59.8%
COPD	18.4%
OBD	9%
Healthy	18.4%
ILD	
NMD	
PVD	
TD	

Conclusions and suggestions:

Highest disease probability based on lung function: **Asthma.**

Repeat spirometry with bronchodilator test, check exhaled NO. Perform methacholine/histamine challenge for final diagnosis.
 Attention: Lung function may be influenced by obesity!
 Attention: Diagnostic suggestion may not be accurate due to missing information of pack-years!

Legend:
 OBD Other Obstructive Diseases (including: cystic fibrosis, bronchiectasis, bronchiolitis)
 Healthy Normal lung function
 ILD Interstitial lung disease (including idiopathic pulmonary fibrosis, nonspecific interstitial pneumonitis and sarcoidosis)
 NMD Neuromuscular disease (including paralysis of the diaphragm, poliomyelitis, myopathy)
 PVD Pulmonary vascular disease (including pulmonary hypertension, embolism and vasculitis)
 TD Thoracic deformity / Pleural disease (including: pneumectomy, lobectomy, chest wall problems, kyphoscoliosis)

© 2019 ArtiQ NV • Belgium • ArtiQ.PFT 1.0.0 WWW.ARTIQ.EU
 This report is approved for clinical use in the EU INFO@ARTIQ.EU

1. Protocol: PFT description as dictated by the international standards

2. Analysis: Diseases probability estimation with machine learning engine

3. Decision support: most likely disease

4. Further suggestions: best medical practice

Labeling information:

Device name and version: GTIN(01)	ArtiQ.PFT 1.5.0 05419980057600		ArtiQ NV Boskouter 15 3010 Leuven Belgium	 1912
VERSION(8012)	8012ArtiQ.PFT1.5.0		2022-04	
	ArtiQ.PFT reports are meant to supplement, and by no means substitute, any other available report.			
CH-REP	QUNIQUE GmbH, Bahnhofweg 17, 5610 Wohlen, Switzerland			