UNIVERSITY OF BRESCIA

PhD Program
in
TECHNOLOGY FOR HEALTH

Validation and outpatient deployment of novel technological approaches exploitable during rehabilitation for the clinical assessment of patients with chronic respiratory diseases

PhD Candidate: Simone Pancera

Email: *s.pancera002@unibs.it*

XXXV Cycle

Tutor: Prof. Nicola Francesco Lopomo

Background

Chronic obstructive pulmonary disease (COPD) is a common, preventable and treatable condition, affecting over 380 million people and considered the fourth leading cause of death worldwide.
Since pulmonary rehabilitation has proven to be an effective tool to enhance exercise tolerance and quality of life in COPD patients, quantify the effectiveness of these interventions assumed a great relevance.
Rehabilitation often deal with the necessity to transfer laboratory-based research protocols in clinical setting, that are more fitting with regard to the physiotherapy goal. for this reason, it is crucial to measure patient-centered outcomes, such as activities of daily life and participation to their social role, by using functional tasks.
In this perspective new motion technologies could be used to improve pulmonary rehabilitation, in order to obtain a better description of the quality of movement and thus a more precise description of functional capacity in COPD individuals.

Objectives

The main goal is helping health-care professionals to choose among functional outcome measures and tests available for the clinical evaluation of patients with COPD, the proposed project aims to provide new and useful information that can integrate standard clinical assessments in the classical field tests. In order to do this, both commercial “off-the-shelf” and customizable technologies will be evaluated.

Methodologies

The three-years project will be developed in fully collaboration with the IRCCS Fondazione Don Carlo Gnocchi ONLUS and could be organized in three different periods.
In the first part, outcomes used for functional evaluations of COPD patients might be reviewed in order to summarize characteristics, limitations and aspects that could be validated for chronic respiratory diseases assessment.
The second part will study the validity and reliability of the assessment methods used to measure functional capacity in healthy subjects and/or COPD patients.
Finally, in order to fulfil a study on pre- and post-treatment improvements in functional capacity after pulmonary rehabilitation in people affected by chronic respiratory diseases, technological implementation role will be considered.

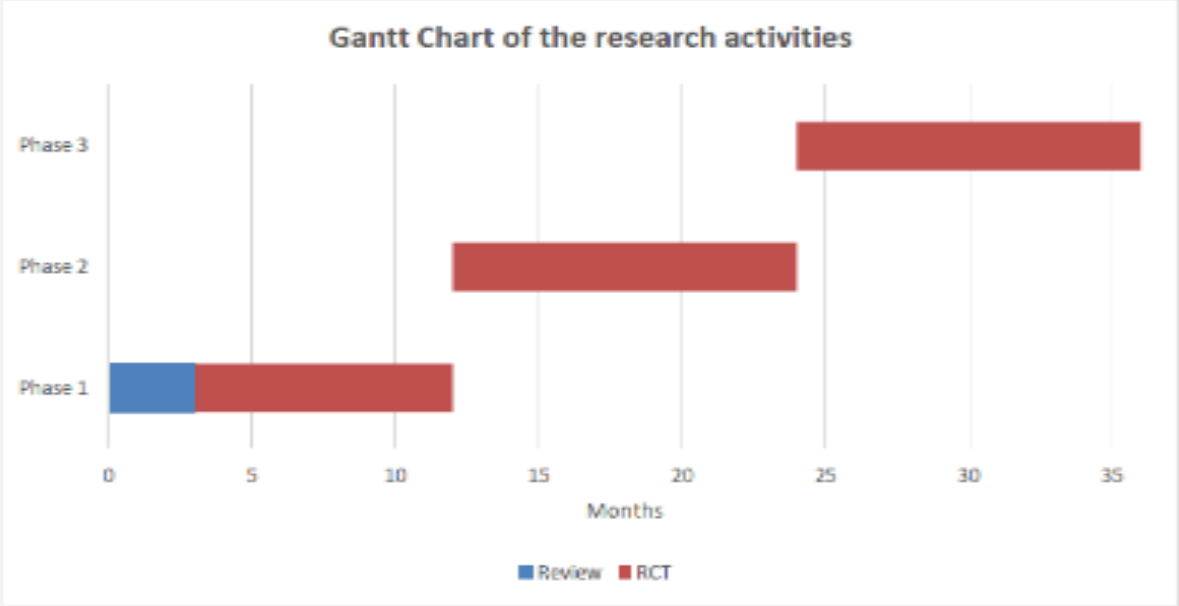

Figure 1. Gantt chart of the research activities with timeline duration of each phase of the project RCT, randomized controlled trials.

Expected Results and Impact

In a clinical context such as that in which the project would be developed, the application of technology could be useful in terms of speeding up normal evaluation activities and increasing their accuracy.

It is also expected that the use of this technology would provide important information such as new quantitative parameters about the functional limitations of COPD patients, in order to better target the rehabilitation treatment.

In conclusion this project could be useful in providing a better understanding of the various defining components of functional status to healthcare professionals, in order to optimize chronic obstructive pulmonary disease evaluation and management, ultimately leading to improved quality of life of patients afflicted by this condition.