

Walk Test Product Design Specifications

John Renfrew, Kenneth O. Xu, Sarah Sandock, Wan-Ting Kou, Josh Kolz

Problem Statement:

There is a clinically-approved cardiopulmonary health test called the 6-minute-walk-test (6WMT) that accurately gauges cardiopulmonary health through a simple technician-guided walk procedure. Our objective is to create a similar test using an iPhone application that will generate 6MWT data at the comfort of the patient's home or any other setting of the patient's choice. This data will be useful in assessing patient improvement by testing the patient before and after medical intervention.

Client requirements:

- Must work on iPhone.
- Ability to store and organize test and clearly display data
- Consider an internet based application alternative.
- Look into expansion of audience to healthy individuals for early diagnosis of mild Chronic Obstructive Pulmonary Disease (COPD).
- Consider performing statistical tests showing that the application gets reliable data through supplementary GPS comparisons.
- Integrate audio encouragements and verbal instructions to assist in 6MWT.
- Show it is as accurate as the current 6MWT by testing.

Novel Test Data

- Record a spoken statement for evaluation.
- Capture heart rate
- Structured report of any problems at the end of the test.
- Free text comments about test results.

Design requirements:

1. Physical and Operational Characteristics

- Performance requirements:* Device must be energy efficient. It should be able to upload to central database for interpersonal comparison and analysis from third party. Compare current 6MWT data and compare with previous attempts and/or general population data.
- Safety:* Must not cause detrimental visual effects and deter from distract patient while he/she is performing test. Possible addition safety button in case of medical emergency during 6MWT.
- Accuracy and Reliability:* Must be able to track distance walked to around ± 5 meters. Must be able to match or exceed performance of clinical 6MWT; must account for varying courses shapes, conditions, and distances.
- Life in Service:* N/A

- e. *Shelf Life*: N/A
- f. *Operating Environment*: In home use or outside
- g. *Ergonomics*: Acquire good Fitts' Law and Hick's Law values
- h. *Size*: Under 50 megabytes
- i. *Weight*: N/A
- j. *Materials*: iPhone, iTouch, iPhone Standard Developer Kit (SDK)
- k. *Aesthetics, Appearance, and Finish*: Large, clear buttons, clean interface, easy to understand voice instructions

2. Production Characteristics

- a. *Quantity*: Available for download when finished
- b. *Target Product Cost*: To be determined

3. Miscellaneous

- a. *Standards and Specifications*: N/A
- b. *Customer*: Patients with COPD and others looking for a health test.
- c. *Patient-related concerns*: Ability to call for help easily through the program
- d. *Competition*: Clinic-run 6MWT, Mechanical Pedometers, iPhone pedometers