

# knee extensors endurance test with elastic resistance

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## Abstract

Reliable clinical tests that are capable of measuring resistance are important tools for rehabilitation. An alternative that has increased popularity is the use of elastic tubes, which stand out for being easy to handle, low cost, practicality, and feasibility of use. To analyze the test-retest reliability of the muscle fatigue resistance test (FRT) with elastic tubes. A total of 116 healthy young males, age between 18 and 30 years old, participated in the study. Participants performed three pre-test stages: orientation, load presentation, and familiarization with equipment lasting two weeks. Subsequently, they performed the FRT on two occasions (test and retest), with an interval of seven days. The reliability analyzes were performed using the intraclass correlation coefficient (ICC) with 95% confidence interval and typical measurement error (TME), also expressed as coefficient of variation (CV%). The findings regarding the reliability of the test showed satisfactory values (time: ICC= 0.66; 95%CI [0.50; 0.76]; CV(%)= 9.34; repetition: ICC= 0.61; 95%CI [0.46; 0.73], CV(%)= 13.66; rhythm: ICC= 0.52; 95%CI [0.35; 0.67], CV(%)= 10.29). From the findings presented, it is concluded that the clinical test proposed with elastic tubes demonstrates evidence of acceptable values.

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## Protocol

### Orientation

#### Step 1.

Information regarding body mass (Tanita BC 554, Iron Man / Inner - Illinois, USA) and height (Sany - American Medical do Brasil, São Paulo, Brazil) were collected. Then, the participants performed two sets of 20 seconds with an individual load classified as "easy" (2 points) by OMNI-RES scale

### Load presentation

#### Step 2.

Participants performed the extension movement using the six possibilities available (Chart 1) in one set of 20 seconds with two intermediate resistances

### Learning and standardization

#### Step 3.

Stage 3 consisted of two sessions of test simulation aiming to familiarize and verify the adequate resistance according to biological individuality. The participants started the procedures with the

resistance tube (100 cm, with a 9 mm x 6 mm diameter tube) (Chart 1). The physical therapists and participants were blinded regarding the resistance used. An independent research assistant stored data and adjusted the appropriate distance to perform the described procedures.

## Test

### **Step 4.**

Participants performed the FRT with the pre-defined load of stage 3. The test results, including time and repetition, were not revealed to the participant and an independent research assistant recorded all the information.