EXPLORING A NEW INDIVIDUALIZED PATIENT EXERCISE TOLERANCE ASSESSMENT FOR CARDIAC REHABILITATION PATIENTS

Presented by Craig Clemens, MA, RCEP, and Nanette Malgesini, MSN, FNP-C, RN

PURPOSE
To evaluate an alternative method for the assessment of exercise tolerance using a recumbent cross trainer to improve the accuracy of the results and safety for patients in an acute cardiac rehabilitation program.

BACKGROUND
A required exercise prescription is a best practice and important for setting individual parameters in which the patient can exercise safely following a cardiac event. A physical fitness assessment includes evaluating a patient’s Metabolic Equivalents (METS) and their Rating of Perceived Exertion (RPE).

The six-minute walk test (6MWT) is a frequently used and extensively researched test for assessing patients’ exercise tolerance in cardiac rehabilitation. However, the 6MWT is not ideal for certain patients including those with:

- Musculoskeletal disorders
- High risk of fall
- Need for canes, walkers and wheelchairs
- High physical function. These patients may not be challenged or able to demonstrate their capabilities with a six-minute flat walk due to a potential ceiling effect.

The option of another type of test, such as the Recumbent Cross Trainer Test (RCTT), could provide an alternative.

METHODS
Design and study question: This study received an expedited IRB approval. Equivalence testing was used in a cross-sectional study of RCTT compared to the 6MWT, in which each participant served as his or her own control. Patients were categorized as low, medium, or high functional ability based on their 6MWT results.

Sample:
- 46 participants completed both the 6MWT and RCTT

Methods:
- Patients were recruited from the weekly, mandatory orientation meeting
- Recruitment occurred over a 5-month period

Procedures:
- Participants performed a baseline 6MWT at their initial orientation meeting
- The RCTT was conducted at the start of their first one-hour exercise session
  - A five-minute warm-up allowed for muscle warm-up and familiarity with the modality
  - The test was performed for 6 minutes at a self-selected cadence and resistance while wearing a telemetry unit for continuous ECG monitoring
  - The test was terminated if participants exceeded 80% of their age-predicted maximum heart rate, experienced any cardiac signs or symptoms, or if significant arrhythmias were observed on telemetry

RESULTS
Low functioning n=6; medium n=32; high n=8.

In both the low and medium functioning patients, METS were lower, although not deemed clinically significant (they represent a difference of only 7.1% and 9.8%, respectively), and RPE was higher during the RCTT test compared to the 6MWT.

These findings were statistically significant only in the medium functioning group (p=0.005).

In the high functioning group, both the METS and RPE were higher during the RCTT compared to the 6MWT, a statistically significant difference for RPE (p=0.037).

DISCUSSION
The high-functioning group in this study perceived significantly higher exertion during the RCTT. The difference of 0.94 METs (average) in the high-functioning group is likely clinically significant as it represents a difference of 26.2%, and almost twice the standard deviation of the average 6MWT results. This matches our clinical observations. Feedback from these patients indicates the 6MWT was too easy.

There was no clinical or statistical significant difference for the low functioning group, but 83.3% of the low-functioning patients were identified as a fall risk and 50% used assistance devices for ambulation. Therefore, the RCTT is a safer method of assessment for these patients as it’s performed on a seated modality.

IMPLICATIONS/CONCLUSIONS
Implementing the RCTT in a cardiac rehabilitation setting is useful for developing an initial exercise prescription for those who are low-functioning, high fall risk, or those who are high-functioning and therefore may find the 6MWT is not reflective of their physical capability.

REFERENCES

Wu G, Sanderson B, Bittner V. The 6-minute walk test: how important is the learning effect? Am Heart J 2003. 146(1).

Contacts:
craig.clemens@elcaminohospital.org
nanette.malgesini@elcaminohospital.org

RCTT physical assessment on patient by cardiac rehabilitation staff. All testing was done on a NuStep 15th (NuStep Inc., Ann Arbor, MI).