The importance of the 6 minute walk test in cardiac rehabilitation

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In the ACT, chronic conditions account for 80% of the total burden of disease and injury, with cardiovascular disease being one of the leading contributors (1). The multidisciplinary Cardiac Rehabilitation (CR) Program at The Canberra Hospital (TCH) is comprised of Cardiac Nurses, Exercise Physiologists, Physiotherapists, Psychologists and Dietitians. The program provides education, exercise and counselling to a varied cardiac population. The program aims to empower patients and promotes self management (1). Patients attend the program twice weekly for 6 weeks.

The six-minute walk test (6MWT) is a tool recommended to guide exercise prescription, monitor patient progress and provide patient reassurance (2, 3). The 6MWT is a sub-maximal test of aerobic capacity (6), it is the safest, easiest, most tolerated, and most functional assessment of cardiovascular fitness compared with other walk tests (6), therefore it is the preferred test for CR.

The 6MWT accurately and independently predicts morbidity and mortality (6), and provides useful data for health professionals to identify areas of the program that require development. The minimum important difference in the 6MWT is estimated as 54m, with 95% confidence limits of 37m - 71m (7). This information assists in determining how patients in CR at TCH are progressing, and whether or not improvements made are meaningful.

Aims
1. To analyse and demonstrate the quantitative outcomes of the 6MWT according to specific populations;
2. To ensure that the exercise prescription being used in CR produces desired results; to enhance walking distance and exercise tolerance.
3. To highlight the need for CR and identify areas of the service requiring improvement.

Methods
- The 6MWT was administered at the commencement and completion of the program.
- Standardised instructions were given so that improvements made could be attributed to improved fitness as opposed to motivation.
- Parameters collected each minute included heart rate (HR), oxygen saturation (SpO2%), RPE (0-10 modified Borg scale) and distance (metres).
- Data was collected for 300 patients between April 2012 – December 2013, and analysed using Microsoft Excel. Statistical significance was calculated using SPSS.
- Mean age was 64 years, with 75% male and 25% female.
- Comparisons were made to normative data (8).

Exclusion Criteria
- The 6MWT forms with incomplete data i.e. undocumented age, gender, HR, SpO2%, distance or RPE;
- Patients who did not complete the program or who were deemed unsuitable to perform the 6MWT on testing days.

Results
270 patients (90%) achieved a greater walking distance by the completion of the program. Average walk test distance prior to commencing CR was 439.9m, and at completion it was 506.77m (Figure 1). The mean improvement in walking distance was 66.87m (p<0.005).

Despite this, only 69 patients (23%) achieved the healthy population’s norm for their age and gender. Males had greater improvements than females (male = 64.86m, p<0.005; females = 56.56m, p<0.005) (Figure 2).

Patients under 40 years walked further (79.9m), but those aged 40–50 showed greater improvements (96.69m) (Figure 3).

Discussion
Results indicated that 90% of patients in CR at TCH, improved their 6MWT distance by the completion of the program. Using 54m as the minimum important difference, it can be assumed the program produces significant improvements. These results indicate that the exercise prescription and guidelines being used at TCH are producing desired outcomes; to enhance walking distance and exercise tolerance. These findings support the need for a multidisciplinary CR program. As the 6MWT has a role in predicting morbidity and mortality, CR may play a vital role in reducing the burden of chronic disease on the ACT.

Given some groups improved more than others, potential areas of work for the TCH CR team could be identified. Therefore the need for females and those outside the age bracket 40-50 should be addressed. The finding that only 23% of the patients achieved distances within healthy norms indicates also that further improvements could still be made.

A limitation of the study is the inability to account for a learning effect. Despite standardised instructions being given, patients may have been nervous or unsure at initial assessment, producing less accurate results. It is difficult to estimate how much of a role confidence and familiarity with the test played.

Conclusions
The CR program at TCH is producing improvements in 6MWT distances, which can be linked to reduced morbidity and mortality. Whilst there are some areas that could potentially be improved, this multidisciplinary program has the potential to help reduce the burden of chronic disease on the ACT. Continuing to collect data will provide direction for future research and assist in evaluating the program.

Acknowledgements
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References
1. ACT Chronic Conditions Strategy - Improving Care and Support 2013.