PRESIDENT'S MESSAGE

Rick Wickstrom, PT, DPT, CPE

The OHSIG has breaking news! APTA obtained a 5/26/2018 letter of clarification from OSHA to establish that all forms of soft tissue massage performed by physical therapy professionals are considered first aid for record keeping purposes. This was a collaborative effort by our OHSIG, APTA Government Affairs, and the Private Practice Section. I want to acknowledge the volunteer contribution by 3 OHSIG members who flew in to meet with OSHA officials: Lorena Payne, Drew Blossen, and Curt DeWeeze. This letter supports direct contracting by physical therapists with the industry. For more information about this initiative, see http://www.apta.org/PTinMotion/News/2019/06/05/OSHAMassagePTs.

Last month, we got a fantastic response to the launch of our mentorship program that is led by our Communications Chair, Caroline Furtak. Our Work Rehab CPG Writing Team led by Lorena Payne is now wrapping up the quality review of additional articles identified in an updated literature search. We have launched a new subcommittee to review Current Concepts in Regulatory Compliance for occupational health. The OHSIG is forming two new standing committee's for Practice/Reimbursement and Membership. If you are interested in serving on either of these committees, please contact any member of our nominating committee.

Next, I would like to put out a call for OHSIG members to share best practice examples from your state on our closed Facebook page that we can leverage to improve the practice environment for physical therapy professionals in occupational health. For example, did you know that Washington State Labor and Industries created special codes for functional capacity evaluations (FCEs), telehealth conferences, and functional job analyses? Washington State has established quality expectations for physical and occupational therapists when performing a complex functional capacity evaluation. They have also designed a useful functional job analysis form that may be downloaded from their website at the following link: https://www.lni.wa.gov/ClaimsIns/Voc/BackToWork/JobAnalysis/default.asp. The most exciting feature of the Washington State Job Analysis form is that the last page contains a release to return the worker to full duty or back to work with restrictions that may be certified by the treating physical therapist/occupational therapist or an independent FCE Examiner!

Finally, in this issue of *Orthopaedic Physical Therapy Practice*, the OHSIG is pleased to introduce a review article about the Chester Step Test (CST). Mindy Renfro, PT, DPT, PhD, and her physical therapy students at Touro University Nevada volunteered to review the Chester Step Test for inclusion in our PTNow database of tests and measures after a suggestion was made to include functional capacity performance measures in PTNow that are relevant to occupational health practice. This review article led by "Team Touro" is the first "fruit" to emerge from this request. It was truly a pleasure to collaborate with Mindy and her group of students on this article. You will discover that the CST has some advantages over self-paced walk tests to help bridge the gap between wellness and rehabilitation. Enjoy!

The Chester Step Test: A Graded Performance Measure of Aerobic Capacity for Physical Therapy

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BACKGROUND

In rehabilitation, an array of factors must be considered to ensure that interventions prescribed lead to desired outcomes. One factor that is crucial to evaluation and progression of physical therapy clients is ensuring that appropriate tasks are prescribed to challenge the fitness of cardiorespiratory and musculoskeletal systems. Failing to challenge a client's abilities leads to inadequate gains, while overworking may lead to fatigue and injury.[1] A hot topic in rehabilitation practice is finding a quick, efficient, and low-cost test of cardiorespiratory fitness (CRF) that is reliable and valid. Low CRF is a stronger predictor of all-cause mortality and cardiovascular events than risk factors such as physical inactivity, obesity, smoking, hypertension, abnormal lipids, and diabetes mellitus.[2,3] Maximum oxygen consumption (VO_2max) is often estimated less costly submaximal exercise tests to prescribe suitable physical activity or classify fitness based on normative results for healthy adults.[4]

The Chester Step Test (CST) is a simple, submaximal test of aerobic capacity that was originally designed by Kevin Sykes to predict maximal aerobic power, based on the heart rate responses to progressive workloads.[5] The CST is a versatile step test that has been used in a broad range of fitness and clinical applications that include (1) tracking of changes in aerobic fitness in healthy adults,[6] (2) assessing of fitness-for-duty of disaster deployment personnel,[7] and (3) assessing of exercise capacity in patients with chronic lung disease.[8] The CST protocol allows the examiner to choose a suitable fixed step height that ranges from 15 cm (6") to 30 cm (12"), based on factors such as age, functional capacity, activity level, height, and obesity. The subject steps on and off the step platform (Figure 1) in cadence with a metronome beat that is increased by 5 steps per minute at each 2-minute stage (15, 20, 25, 30, and 35 steps per minute). Heart rate (HR) and rating of perceived exertion (RPE) are measured at the end of each stage to assess the participant's response to each incremental workload. Step pace is increased with each stage, until individuals reach 80% of their predicted HR maximum (based on 220-age), reports an RPE ≥ 14 using the 6 to 20 Borg scale,[9] or completes all 5 stages in a 10-minute period. The CST uses the ACSM stair-stepping equation to estimate the workload oxygen cost (mlO_2/kg/min) for the step height and pace at each stage.[10] A visual or statistical line of best fit is drawn using datapoints for HR (y-axis) and workload (x-axis) that is extended up to maximum HR to estimate maximum aerobic capacity (mlO_2/kg/min) from the x-axis.[5]

Figure 1. Chester Step Test administration.

PURPOSE

The purpose of this literature review is to assess the validity and reliability of the CST as a tool for assessing aerobic capacity of individuals during physical therapy care. This review was requested to provide useful information about CST for practicing clinicians in the PTNow website of Tests and Measures of the American Physical Therapy Association (APTA).

METHODS

Search Strategy and Selection Criteria

The literature search was conducted in the databases CINAHL, Cochrane Library, Embase, Google Scholar, PTNow, PubMed, Scopus, and SPORTDiscus. The search terms used included "Chester step test", Chester step test, "Chester step test" AND VO_2max AND aerobic capacity AND cardiorespiratory fitness. The searches were completed in January 2019 by five reviewers (EA, CC, MH, AV, and DV). Search filters were used with Google Scholar and PTNow, which limited results to more recent literature from 2010-2019 and 2003-2019, respectively. The reviewers independently screened the titles and abstracts of the acquired articles to determine if they met the inclusion and exclusion criteria. After duplicate articles were extracted and inclusion and exclusion criteria were assessed, 22 relevant articles remained. Studies were included if (1) they analyzed the validity or reliability of the CST, (2) access was available to the full text article, (3) subjects were adults age 18+, and (4) the article was published in English in a peer-reviewed journal. Articles were excluded if the CST was not studied. Reference lists of included articles were also screened for other applicable articles.

Quality Assessment

A two-step process was used to appraise the selected articles. The appraisal tool of 11 questions from *Evidence Based Physical Therapy* by Fetters and Tilson[11] was used to assess article quality and applicability. The total score for each article varied depending on the number of questions applicable to the article. If a question was inapplicable, it was removed from the total score. Therefore, some articles were rated out of a total score of 11 and other articles were rated out of a total score of less than 11. Each article was appraised by two independent reviewers, who then compared scores. Disagreements between scores were resolved through consensus and a third-party adjudication. Articles that did not fit inclusion criteria were removed.

FINDINGS

Thirteen articles (Table 1) were identified as appropriate based on inclusion and exclusion criteria.[5,12-23] These articles were high quality based on the reviewers' appraisal and the ratings ranged from 62.5% to 100%. The samples described in the articles involved various populations, such as healthy adults, university students, steel workers, and patients with lung diseases. Sample sizes in the studies ranged from 13 to 171 subjects. The studies were conducted internationally in countries including the United Kingdom, Brazil, Australia, United States, and Iran.

Step heights used in these studies for the CST ranged from 17 cm (7") to 30 cm (12"). In studies of patients with chronic obstructive pulmonary disease (COPD) or lung diseases, the step height was lowered to 17 cm (7")[20] or 20 cm (8").[12,14-16,19] A 30 cm (12") step height was used in studies looking at healthy subjects or university students.[5,10]

Criteria for stopping the test varied somewhat between studies:

- When the subject obtained 80% to 90% of age predicted HRmax[5,13,17-18, 20,23]
- When SpO_2 levels dropped below 84% to 88%[14,19]
- The subject was unable to maintain pace with the metronome[12,14,15,19,20]
- The subject reported symptoms of dyspnea or fatigue[12,14,15,19,20]
- One study[20] used a different equation to predict maximum HR = 210-(0.65*age)

If a subject experienced any of the above criteria, then the test was terminated, and the subject would not continue onto the next stage of the CST. Subjects who were able to complete all 5 stages of the CST were tested for a maximum duration of 10 minutes.

Many of the studies found the CST to be a reliable tool for assessing CRF.[5,13-15,23] Sykes and Roberts,[5] Buckley et al,[13] and Saremi et al[23] concluded that the CST is a reliable test for assessing aerobic capacity among healthy subjects. The CST has been found to be reliable for assessing aerobic capacity in patients with bronchiectasis and COPD.[14,15]

In addition to assessing CRF, the CST can be used to assess functional performance and fitness levels.[18-20] Several studies found that the CST can assess functional capacity in patients with COPD and acute lung diseases.[19,20] Karloh et al[20] found that CST was significantly correlated with TShuttle (r=0.67) and the Six Minute Walk Test (6MWT) (r=0.83), which require more space to administer. Several studies used the total number of steps completed on the CST at a lower 20 cm (8") step height as the main outcome measure for COPD patients.[12,14,16,19] Total steps were found to be highly reliable and correlated with 6MWT results. Several studies evaluated a modified pacing protocol to reduce the initial pace to 10 steps per minute and provide for a more gradual progression of 1 step every 30 seconds with COPD patients.[12,14-16] Gray et al[18] found that male steel workers with lower CRF based on the CST were more likely to have greater cardiovascular disease risk. Additionally, this study provides evidence that the CST has good prognostic value for prediction of cardiovascular disease.[18]

Table 1. Studies Included in this Review

Study Reference	Sample [Country]	Step Height	CST Procedure/Modifications	Reliability
Andrade et al 2012[12]	32 subjects with COPD (ages 67±8) with COPD [Brazil]	20 cm	a. Main outcome was NOS performed. b. Stopped test when participant was unable to maintain step pace, dyspnea, or fatigue. c. Substituted Borg 0-10 category ratio scale to assess dyspnea and lower limb fatigue.	MIST and CST showed similar cardiopulmonary responses and exertion effort at peak exercise. CST Test-retest HR (ICC 0.88), SpO_2% (ICC 0.91), NOS (0.99).
Buckley et al 2003[13]	13 healthy university students (age 22.4±4.6, 7 males) [UK]	30 cm	Only change was that end point of test was increased to 90% predicted HRmax and/or RPE 17.	CST is reliable for test-retest assessment of aerobic fitness in healthy young adults. Recommended a practice trial to improve RPE and %HRmax correlation and not using datapoints for Stage 1.
Camargo et al 2011[14]	17 patients (6 men, age 52±17) with bronchiectasis (BCT) [Brazil]	20 cm	a. Main outcome was NOS performed. b. Stopped test when participant was unable to maintain step rate, SpO_2 <88%, dyspnea, or fatigue. c. Substituted Borg 0-10 category ratio scale to assess dyspnea and lower limb fatigue.	Test-retest for NOS highly reproducible (66±41 steps, 68±41 steps)
Camargo et al 2013[15]	17 patients with bronchiectasis [Brazil]	20 cm	a. Main outcome was NOS performed. b. Stopped test when participant was unable to maintain step pace, SpO_2 <88%, dyspnea, or fatigue. c. Substituted Borg 0-10 category ratio scale to assess dyspnea and lower limb fatigue.	CST and MIST were reliable in BCT patients. Test-retest reliability for CST was: HR (ICC 0.88), SpO_2% (ICC 0.91), and NOS (0.99). Test-retest means for NOS was similar for CST (124±65 and 125±67) and MIST (158±83 and 156±76). No difference between MIST and CST for cardiopulmonary responses and exertion at peak exercise level.
Dal Corso S et al 2013[16]	34 patients (age 67±9) with COPD [Brazil]	20 cm	a. Main outcome: Vertical distance calculates by multiplying step height by NOS. b. Symptom-limited IST is a modification to CST with lower initial step rate (10 steps/min) and pace increased by 1 step/min every 30 sec. Allowed handrail. Stopped with intolerable dyspnea, fatigue, or pace. c. Substituted Borg 0-10 category ratio scale to assess dyspnea and lower limb fatigue.	IST test-retest was highly reproducible 2-5 days later with NOS (ICC 0.98), VO2 (ICC 0.99), VE (ICC 0.97), HR (ICC 0.92), SpO_2 (ICC 0.96). Most had better performance on IST2.
Elliot D et al 2006[17]	25 healthy subjects [UK]	Not specified	CST performed with active and passive arm action on separate occasions.	Not stated.
Gray et al 2016[18]	81 male steel workers [UK]	Not specified		
Jose and Dal Corso 2016[19]	77 patients with acute lung diseases and 20 healthy subjects [Brazil]	20 cm	a. Main outcome: NOS. b. Substituted Borg 0-10 category ratio scale. c. Test ended when participant had dyspnea, fatigue, unable to maintain pace, or SpO_2 < 84%.	N/A
Karloh et al 2013[20]	10 patients with COPD and 10 healthy sedentary subjects (age 63±7 [Brazil]	17 cm	a. Test stopped when subject could not keep pace, showed limiting symptoms, or reached 90% predicted HRmax, calculated with 210-(0.65*age). b. Substituted Borg 0-10 category ratio scale to assess dyspnea.	N/A

Validity
Exercise tolerance (test time) higher in MIST (6.1±2.2 min) compared to CST (8.8±2.8 min). Similar correlation for NOS with 6MWT distance for CST NOS (r=0.72) and MIST (r=0.80). Similar correlation for NOS with FEV1 for CST (r=0.62) and MIST (r=0.66).
Questionable validity in predicting VO_2max. Estimated vs. actual maximum VO_2 show errors ranging from 11 to 17%. Age-estimated HRmax significantly overestimated actual HRmax by a mean of 5 beats/min. CST1 underestimated actual VO_2max by 2.8 ml/kg/min (p=0.006) and CST2 by 1.6ml/kg/min (not significant).
NOS correlates with FEV1 (r=0.43), 6MWT distance (r=0.60), and incremental cycling test (r=0.69).
CST compared with 6MWT and MIST with lower initial step rate and pace increased by 1 step/min every 30 sec. Better exercise tolerance (test time) for MIST (8.6±3.0 min) than for CST (6.0±2.2 min). Similar correlation with 6MWT distance for CST NOS (r=0.72) and MIST (r=0.80). Similar correlation for CST NOS with FEV1 for CST (r=0.62) and MIST (r=0.66).
NOS and weight explained 80% of variance in peak V02. IST elicits maximal cardiopulmonary and metabolic responses and is well-tolerated. Peak VO_2 was higher for IST1 and IST2 (1.19±0.39 L, 1.20±0.40 L) than cycling (1.07±0.35 L) with no difference in ventilation, HR, or RPE responses.
Active arm action during CST had no significant impact on predicted VO_2max, but did increase Heart Rate by about 7 beats/min across all stages.
CST can be used for cardiorespiratory fitness testing for prediction of cardiovascular disease. CRF level of 34.5 ml/kg/min identified persons over QRISK2 threshold with sensitivity (0.80) and specificity (0.687). Five times higher cardiovascular risk for Average-Below Average vs. Good-Excellent fitness classification.
Number of steps of CST and MIST were similarly correlated with length of hospitalization, lung function, dyspnea, and 6MWT (r=0.59, r=0.64). CST and MIST are safe and can be used to assess functional capacity in patients hospitalized for acute lung diseases.
CST is valid for assessment of functional capacity of COPD patients and distinguished between performances of COPD patients and healthy subjects. CST correlated with TShuttle (r=0.67) and 6MWT (r=0.83).

(Continued on page 176)

Several studies have evaluated the validity of the CST in estimating VO_2max.[5,13,23] The study by Sykes and Roberts[5] found there is a high correlation between VO_2max and the CST; therefore, this suggests that the CST can be used to estimate VO_2max. Additionally, Saremi et al[23] found that the CST is a valid test for estimating cardiorespiratory capacity among university students that was significantly correlated (r=0.868) with actual VO_2max as calculated by the Astrand-rhyming cycle ergometer test. Buckley et al[13] used the same CST procedure as the one outlined in Sykes and Roberts's[5] study, with the only difference being that Buckley et al[13] changed the end point of the test to 90% of predicted HRmax and/or RPE 17 (out of 20) to get vital sign measurements for VO_2max estimation from as many stages of the CST as possible. Despite using the same CST procedure, Buckley et al[13] found the validity of the CST to estimate VO_2max to be questionable. These two studies demonstrate conflicting evidence regarding the validity of the CST.[5,13]

CLINICAL RELEVANCE

The reliability, validity, versatility, and low cost of the CST makes it an attractive option for many clinical settings. The CST provides many advantages over other step tests[6] and self-paced walking tests due to the option to adjust the step height based on an individual's fitness, use of a small evaluation space, external pacing, and short completion time. The CST can be performed safely in a small clinic room, at home, the workplace, and other community settings.

Many studies used to establish the reliability and validity of the CST were performed on young, healthy participants who were able to tolerate the intensity of the 30 cm (12") step. Physical therapists performing the CST must use sound clinical judgment when deciding what step height and increment of cadence to use with each patient. Three modifications to accommodate less-fit populations include:

1. **Step Height:** Lower steps of 15 cm (6") and 20 cm (8") may be used to provide accurate data while increasing patient safety for patients in hospital settings or those with chronic diseases. A higher step of 40 cm (16") may provide a greater physical challenge for fitter athletes. A much lower step of 10 cm (4") would be an alternative to consider to accommodate patients with more severe obesity, lower extremity impairments, or cardiopulmonary impairments.
2. **Testing Intervals:** One concern with the CST in less athletic individuals is the rigor of keeping up with the two-minute phases. Reducing these 5 two-minute phases into 10 one-minute phases is less strenuous on those with respiratory issues or other frailties. This would also make findings more sensitive, giving better estimates of CRF or highest workload completed.[15]
3. **Activity Prescription:** The CST is an incremental functional performance test of aerobic capacity that may be used to assess readiness for physical activity.[19-20] The predicted maximum VO_2 and peak workload level that was performed on the CST may be compared to representative aerobic demands of specific occupation or lifestyle tasks that are contained in ACSM's Guidelines for Exercise Testing and Prescription.[4] For example, Table 1.1 in the ACSM Guidelines reports that the metabolic equivalent for mowing the grass with a push mower is 5.5 METs. Table 2 may be used to look up the peak workload achieved by a client, based on the highest accept-

Table 1. Studies Included in this Review *(continued from page 175)*

Study Reference	Sample [Country]	Step Height	CST Procedure/Modifications	Reliability
Lau HM, et al 2005[21]	171 patients (ages 37±12, 60 men) with SARS [Australia]	Not stated	None stated.	N/A
Lau HM, Ng GY et al. 2005[22]	133 SARS patients (62 Controls: age 38.3±11.2 n=62, 71 Exercise: age 35.9±9.3)	Not stated	None stated.	N/A
Saremi et al[23]	63 (age 20.17±1.8, 29 male) university students [Iran]	Not stated		Stepped to metronome at 15 steps/min with step rate increasing by 5 steps/min every 2 min. Max test duration 10 min. Test ended when subject showed signs of over-exhaustion or reached 85% HRmax. Step height unspecified.
Sykes and Roberts[5]	68 healthy subjects [UK]	30 cm	Standard protocol.	Mean difference of -0.7ml/kg/min between sessions.

Abbreviations: CST, Chester step test; COPD, chronic obstructive pulmonary disease; NOS, number of steps; SpO_2, peripheral capillary oxygen consumption; MIST, modified incremental step test; HR, heart rate: ICC, interclass coefficient; 6MWT, 6 minute walk test; FEV_1, forced expiratory volume; HRmax, maximum heart rate; RPE, rate of perceived exertion; VO_2max, maximum oxygen consumption; BCT, bronchiectasis; VO_2, oxygen consumption; VE,ventilatory efficiency; CRF, cardiorespiratory fitness; QRISK2, cardiovascular disease risk algorithm; SARS, Severe Acute Respiratory Syndrome

able pace completed for a given step height. A client who only achieves a peak workload of 3.94 METs for stepping at 15 steps per minute to a 20 cm (8-in) step platform is not ready to perform this task, but could be cleared to perform light household chores that require 2.0-2.5 METs.

4. **Heart Rate Effects Due to Age, Medication, or Pain:** The 220-age method to estimate maximum HR has been shown to underestimate VO_2max results for older adults.[24] Gellish et al[25] recommended 220 – (0.7 * age) to estimate maximum HR for healthy adults. One of the limitations with using HR for extrapolation is that medications such as betablockers may lower the HR response, resulting in overprediction of aerobic capacity. Brauner et al[26] recommended 164 – (0.7 * age) to estimate maximum HR for patients with coronary artery disease on beta-blocker medications. Another challenge for orthopaedic patients is that pain may not allow a sufficient HR response for a valid prediction of VO_2max. While medications or musculoskeletal symptoms may invalidate prediction of VO_2max, workload at the highest stage completed and HR/RPE responses still provides useful functional performance data to justify therapy progress or readiness for physical activity.

It is recommended that the test be performed as instructed whenever possible. Deviations from the CST's original protocol[5] may compromise its validity and reliability. However, researchers have shown that modifying the workload progression of the CST with COPD patients resulted in equivalent cardiopulmonary stress at exertion at the peak exercise level.[12] This validates the use of functional performance outcomes such as total number of steps or peak workload completed to assess improvements in CRF and weight-bearing exercise tolerance. Figure 2 illustrates how modification of step height may be used to provide a different workload progression for clients based on whether recent physical activity level was vigorous, moderate, or inactive. Choosing a suitable step height allows the clinician a simple and inexpensive way for a clini-

Table 2. Workloads for Step Test in METs at Different Combinations of Step Pace and Height[10]

		Step Height	
Step Pace	10cm (4in)	20cm (8in)	30cm (12in)
35	5.43	7.86	10.3
32.5	5.12	7.37	9.63
30	4.80	6.88	8.97
27.5	4.48	6.39	8.3
25	4.17	5.90	7.64
22.5	3.85	5.41	6.98
20	3.53	4.92	6.31
17.5	3.22	4.43	5.65
15	2.90	3.94	4.98
12.5	2.58	3.45	4.32
10	2.27	2.96	3.66
(steps/min)	METs	METs	METs

Workload METs = [3.5 + (0.2 x steps/min) + (1.33 x 1.8 x Step Height (cm) x 0.01cm/m x steps/min)]/3.5

Validity
Values of predicted maximum VO_2 (mL*kg-1*min-1) lower for significantly lower for SARS patients than normative data (43 Men: 38.47±7.39, 91 women: 36.12±7.42). 41% completed all 5 levels of CST.
Randomized Controlled Trial revealed significant improvement for exercise group compared to control for CST predicted VO_2 (3.6±5.4), six-minute walk distance, hand grip, curl-up, and push-up.
CST is a valid and reliable test for estimating cardiorespiratory capacity among university students.
High overall correlation (r=0.092) for predicted with directly measured VO_2max from a graded treadmill test with a standard error of predicted CST1 of ±3.9 ml/kg/min.

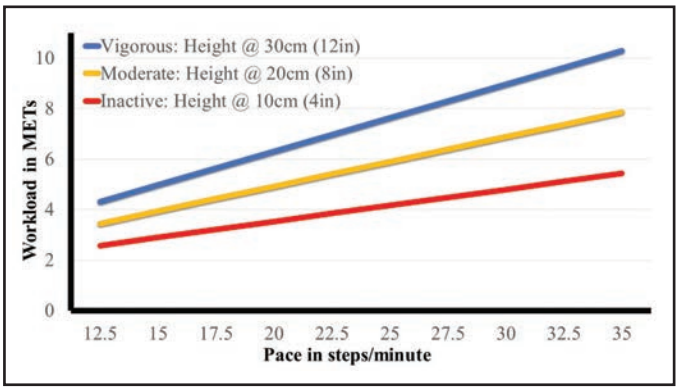

Figure 2. Effect of step height on workload progression.

cian to assess functional progress and readiness for more weight-bearing physical activity.

CONCLUSIONS

This review of the literature supports the use of the CST as a reliable and valid measure of functional performance for physical therapy practice. The CST offers many advantages over other aerobic fitness tests that include low cost, portability, minimal space requirements, brief administration time, adjustable step heights based on fitness status, and standardized pacing progression.

Although most of the research for the CST has been done with healthy adults and patients with cardiopulmonary conditions, the evidence reviewed suggests that the test would be a safe and relevant alternative to the 6MWT. It also suggests that the CST may be used as a functional performance test with patients that have orthopaedic and other health conditions, ranging from acute cardiopulmonary disease to high-functioning, physically active individuals. The CST allows the clinician to safely establish baseline CRF and observe how the patient tolerates and responds to increasing physical activity.

The reliability and validity of the CST to estimate VO_2max rely on normal HR response to increasing workloads. Common cardiorespiratory medications such as beta-blockers will inhibit the patient's heart rate response to increasing workload. This may limit their performance and cause the CST calculations to underestimate maximum cardiorespiratory function. Additionally, the performance of patients with lower extremity musculoskeletal impairments may reach mechanical limitations prior to their maximum aerobic capabilities. This may lead to the underestimation of their actual cardiorespiratory capacity. For this reason, clinicians must adjust the test to appropriately accommodate these variables.

The available literature on the CST indicates a number of possible areas for future research. These include validation of the CST as a measure of/with:

- specific functional capacities,
- modifications with a variety of patient populations,
- using the highest tolerated workload as an outcome measure of performance, and
- guidelines for concluding the test.

This literature review concludes that the CST is a valid and reliable clinical measure of aerobic capacity for physical therapists to use for a wide range of patients and settings. Its future study and expansion will benefit the profession as we investigate and establish the best tests and measures for evidence-based clinical practice.

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