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## PHYSIOTHERAPY GUIDELINE

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<b>TITLE</b>	<b>Technical Standard for Functional Exercise Testing – 6 Minute Walk Test</b>
<b>DESCRIPTION</b>	To provide instructions on the assessment of functional exercise capacity using the 6 minute walk test in adult patients with cardio-respiratory impairment,
<b>TARGET AUDIENCE</b>	Physiotherapists

### Aims

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- To evaluate cardiovascular and respiratory disease
- To assess functional capacity and evaluate undiagnosed exercise intolerance
- To predict mortality and morbidity in specific patient groups
- To evaluate unexplained dyspnoea and disproportionate symptoms to resting tests
- To assess and aid prescription for oxygen therapy.
- To evaluate response to therapy / intervention
- To provide baseline data (pre operative or other)
- To guide exercise prescription using recommended clinical guidelines

### 6 Minute Walk Test (6MWT) overview

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- The 6MWT is a practical, simple, **self-paced** walking test that assesses the **submaximal** level of functional exercise capacity.
- Changes in the 6 minute walk distance (6MWD) are used to evaluate the efficacy of therapeutic interventions including pharmaceutical management, surgery, rehabilitation and exercise prescription.
- It elicits similar  $VO_{2peak}$  to that obtained from cardiopulmonary exercise testing (CPET).
- It is a marker of disease severity and prognosis and is associated with hospitalisation and mortality.
- The 6MWT evaluates the global and integrated response of all systems involved during exercise. It does not provide specific information on the function of each of the different systems involved in exercise nor the mechanism of exercise limitation as is possible with maximal cardiopulmonary exercise testing.
- Monitoring, including continuous pulse oximetry, ECG and BP may be used with the 6MWT to help assess the safety of exercise, and exercise capacity, with and without supplemental oxygen.
- It is a recommended measure of functional exercise capacity in patients with chronic obstructive pulmonary disease (COPD), interstitial lung disease, pulmonary artery hypertension, coronary heart disease and chronic heart failure (CHF).

## Test location and staffing

### Location:

- The walking track should be the same layout for all tests for each patient and may be a continuous (oval or rectangular) or a point-to-point (stop, turn around, go) track.
- For a centre-based 6MWT, the track should ideally be a long flat, straight, hard surfaced, enclosed corridor of at least 30m, marked in metre increments. *Note: If a 30m track is not available, the same track should be used for all tests and note that the total distance walked may be less, due to the patient having to slow down and turn more often in the six minutes. The minimum length should be no less than 15m<sup>11</sup>.*

### Staffing:

- Clinicians should only perform the 6MWT if they have been assessed as being competent to administer the test. See Appendix 1 for an example of a competency process.
- All staff undertaking 6MWT should possess current competencies in basic life support.
- For high risk patients, an additional staff member should be present during the test as a spotter.

## Assessment

Screening tools may be used to assist clinical reasoning in undertaking the 6MWT. See Appendix 2 for an example of one of these tools.

## Contraindications to performing a 6MWT

Absolute contraindications	Relative contraindications
Acute myocardial infarction (3-5 days)	Left main coronary stenosis
Unstable angina within the previous 4 weeks	Moderate stenotic valvular heart disease
Uncontrolled arrhythmias causing symptoms or haemodynamic compromise	Severe untreated arterial hypertension at rest (200mmHg systolic, 120mmHg diastolic)
Syncope	Tachyarrhythmias or bradyarrhythmias
Acute endocarditis	High degree atrioventricular block
Acute myocarditis or pericarditis	Hypertrophic cardiomyopathy
Symptomatic severe aortic stenosis	Significant pulmonary hypertension
Uncontrolled heart failure	Advanced or complicated pregnancy
Acute pulmonary embolus or pulmonary infarction	Electrolyte abnormalities
Thrombosis of lower extremities	Orthopaedic impairment that prevents walking
Suspected dissecting aneurysm	
Uncontrolled asthma	
Pulmonary oedema	
Room air SpO <sub>2</sub> at rest < 80% *	
Acute respiratory failure	
Acute non cardiopulmonary disorder that may affect exercise performance or be aggravated by exercise (ie infection, renal failure, thyrotoxicosis)	
Mental impairment leading to inability to co-operate	

\* exercise patient with supplemental oxygen

*Reproduced from Holland et al, 2014<sup>1</sup>*

**Note:** With regard to SpO<sub>2</sub> <80%, use clinical judgement if asymptomatic or in the presence of (R) – (L) shunt (e.g. Eisenmenger’s syndrome).

Liaison with the referrer, a physician or medical officer, is recommended if patients are identified with the above contraindications or identified as high risk, to determine if the test should proceed. If the test can proceed, this discussion should include whether additional safety measures are required to minimise adverse events.

### **Safety issues associated with 6MWT testing**

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Serious adverse events are possible during or following the performance of a 6MWT. The following safety points should be undertaken to minimize risk associated with this test.

- The clinician/s supervising the 6MWT should be trained in cardiopulmonary resuscitation, be experienced in performing 6MWTs, and be assessed as competent to administer the test.
- Local area safety procedures should be followed and an emergency plan developed
- Oxygen therapy should be available in the testing location for all tests.
- Testing should be performed in a location where a rapid, appropriate response to a medical emergency is possible. Where possible, resuscitation equipment should be in the vicinity of the area designated for exercise testing. Tests that are not performed in a hospital environment (e.g. community programs) should ensure adequate emergency procedures are in place including having a working telephone available to call an ambulance.
- Staff performing tests should be experienced to identify potential adverse symptoms and determine when the test should be terminated. 6MWT's are stopped based on clinician judgement in addition to severity and nature of symptoms experienced by the patient.
- Any prescribed medications such as inhaled beta agonists, GTN or Pulmonary Artery Hypertension (PAH) specific inhalation therapies (e.g. Iloprost), must be carried by the patient and used as appropriate. Testing should be timed accordingly for these medications.
- Additional chairs may be placed at intervals along the circuit to enable the patient to rest as appropriate.
- Before commencing, the test should be explained thoroughly to the patient using standardised instructions.
  - For some patient populations screening questions to ascertain current medical status should be performed. See Appendix 2 for an example of a screening tool. The assessment should include a review medical chart for relevant patient history as well as specific questioning appropriate for the patient. This may include the following:
    - General health, recent symptoms/changes in symptoms
    - Diabetes specific information (e.g. current BGLs, symptoms, recent control)
    - Peripheral oedema, abdominal distension
    - Heart palpitations, cardiac rhythm (e.g. irregular pulse in individual with previously regularly pulse)
    - Dyspnoea at rest or with activity?
    - Dizziness/syncope?
    - Pain?
    - Long term oxygen therapy?

## Preparation

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### *Patient preparation*

No vigorous exercise should be undertaken in the 2 hours preceding the 6MWT. If RFTs are being performed, these should be done prior to undertaking the 6MWT.

### *Oxygen*

If the patient is on long-term oxygen therapy, the 6MWT should be carried out using the prescribed level of inspired oxygen. The flow rate, method of delivery, and whether the patient is independent, or dependent mobilising the supplemental oxygen supply should be documented on the 6MWT recording sheet. This should be replicated in repeat testing if comparison of results is desired.

With the exception of emergency situations, oxygen should not be titrated when the 6MWT distance is the measured outcome.

Regardless of whether the test is being conducted with supplemental oxygen or on room air, oxygen therapy and an appropriate delivery system should be readily available during the test, for use if required.

### *Medications*

Pre-test administration of medications such as bronchodilators, anti-angina medication or PAH specific inhalation therapies (e.g. Iloprost) should be performed if prescribed to the patient for use prior to exercise/activity. This is to be documented on the 6MWT recording sheet, and replicated in repeat testing if comparison of results is desired.

## **Suggested Equipment:**

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- At least one chair, positioned at one end of the walking course
- Pulse oximeter with appropriate sensor (finger or forehead)
- Stop watch or timer
- Standardised 6MWT instructions (Appendix 3)
- Validated dyspnoea or exertion measure (eg. Modified BORG or RPE) (Appendix 4 & 5)
- 6MWT recording sheet (Appendix 6) and clip board
- Access to portable oxygen supply and oxygen delivery consumables. eg.nasal cannulae
- Sphygmomanometer and stethoscope, or similar method of accurately assessing BP
- Access to phone +/- access to an emergency call button

## **Monitoring during the 6MWT**

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During the 6MWT, the supervising clinician should consider the following:

- Continuous pulse oximetry is recommended to be used for all patients to measure heart rate and oxygen saturation, in order to assess the patient's physiological response to exercise. A finger sensor is appropriate for the majority of patients, however, an ear lobe or forehead sensor is recommended for patients with limitations to accurate peripheral SpO<sub>2</sub> assessment (eg patient's with scleroderma, Raynaud's disease, very poor peripheral perfusion). Note that HR monitoring may not be accurately detected in those with an irregular pulse (e.g. AF).
- Alternative devices such as a Polarcare Heart Rate monitor may be substituted for a pulse oximeter as determined appropriate by the clinician.
- A validated dyspnoea scale (e.g. Modified BORG dyspnoea scale – Appendix 4) is used to measure the respiratory patient's perception of dyspnoea, during the 6MWT.
- A validated exertion scale, such as the Rating of Perceived Exertion (RPE - Appendix 5), is used to measure the cardiac patient's perception of exertion during the 6MWT. For cardiac patients, blood pressure should be monitored, at least pre- and post-test. If the BP response is abnormal, this should be monitored each minute post-test until it approaches resting values.

## ***Standardised performance***

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Results of the 6MWT are influenced by multiple factors. For the most accurate results, the test should be standardised in the following manner.

- If the patient has not performed a 6MWT before, the 6MWT should be performed on *two occasions* to account for any learning effect. The best distance walked at the completion of the 6 minutes should be recorded in metres. If the two tests are performed on the same day, at least 30 minutes rest should be allowed between tests. Debilitated individuals may require tests to be performed on separate days, preferably less than one week apart. In frail individuals with cardiac disease, the clinician may recommend performance of only 1 test <sup>2,3</sup>. Similarly, only one test is required for reassessment following rehabilitation.
- A comfortable ambient temperature and humidity should be maintained for all tests.
- Patients who usually walk with a walking aid should use this aid for the test as well as all repeat tests. This information should be documented in the 6MWT recording sheet.
- In the community/home setting it may be necessary to modify the test. This must be documented on the 6 MWT Recording Sheet and replicated for repeat testing in the same patient. Consider use of alternative exercise tests if the environment is unsuitable for 6MWT. If the location requirements as described above are not available, then any 6MWT performed cannot be used for prescriptive purposes. It becomes a functional measure for that patient.
- Instruction and encouragement must be standardised (Appendix 3)
- If a staff member is to walk with the patient for safety reasons, or if the patient requires supplemental oxygen and is unable to transport it by themselves, the staff member should walk slightly behind the patient to prevent influencing the patient's performance. The staff member should in no way act as a pacer for the patient.

## **6 Minute Walk Test procedure:**

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### *Pre-test*

1. Confirm the reason for conducting the 6MWT. If the test is to be compared to previous tests, check the previous test report and replicate conditions as closely as possible. If modifications of past testing conditions are required, ensure this is clearly documented and any comparisons should be interpreted with caution.
2. Check for contraindications to performing the test and confirm medical clearance when appropriate. Liaise with the referrer or medical team, if the patient is identified to have any conditions that would contraindicate the test, or if they are otherwise identified as being at high risk of cardiorespiratory event. If the test can proceed, discussion should include whether additional safety measures are required to minimise patient risk.
3. Determine if the 6MWT/s are to be performed on room air or supplemental oxygen. If the test is to be performed with supplemental oxygen, the following procedure is recommended at time of testing:
  - a. Deliver oxygen to the patient at the level prescribed for home use for exertion. If oxygen is not prescribed for home use, but the test is to be performed on supplemental oxygen, confirm with the referrer the appropriate flow rate for the test. If this cannot be determined or does not achieve an adequate resting SpO<sub>2</sub> >90%, administer 2L O<sub>2</sub>/min and follow the below procedure:
  - b. Measure SpO<sub>2</sub> after a resting period of 10 minutes. *Note for some patients further time may be required for equilibrium of SpO<sub>2</sub> to be reached.* Increase oxygen in 1L/min increments until resting SpO<sub>2</sub> >90%. *Care should be taken in hypercapnic patients as an increase in oxygen concentration may alter their respiratory drive.*
  - c. Discontinue the test if a resting SpO<sub>2</sub> >90% is not achieved and note the outcome in the medical file. Liaise with the referrer.

4. Arrange a suitable time and location to perform the test. Ensure that you adhere to local safety standards. Ensure suitable equipment is available. If other clinicians are required for safety, ensure their availability.
5. If deemed appropriate pre-test, arrange for the patient to take their prescribed reliever medication within one hour prior to commencement, or on arrival for testing.
6. Arrange for the patient to rest for 10 minutes prior to the start of the test.
7. Complete the appropriate pre-test sections of the 6MWT recording sheet. Calculate predicted heart rate max, and document any relevant test conditions.
8. Record appropriate resting measures.
9. Read the standardised test instructions (Appendix 3) to the patient.

#### *During the test*

10. Start the 6MWT and supervise the patient throughout. **Refer to 6MWT termination criteria below for ceasing 6MWT.** Record reason if test needed to be ceased.
11. Record the number of laps walked, and provide standardised encouragement each minute.
12. Record appropriate measures during the test (e.g. HR, SpO<sub>2</sub>, exertion).
13. If the patient stops to rest, they may do so in sitting or standing. Whilst stopped, standardised encouragement should be provided every 30 seconds and the time that the patient stops and recommences walking should be recorded. The stop watch should not be ceased during the time that the patient rests.

#### *Post test*

14. At the end of the 6MWT, the patient should stop and sit in a chair to recover. Record appropriate end-test measures (e.g. SpO<sub>2</sub>, HR, exertion/dyspnoea, total distance walked). Continue to supervise and record appropriate measures each minute until they approach baseline values. This time will vary for different patient groups.
15. Initiate local protocols if the patient fails to recover to baseline within a reasonable time.
16. Allow the patient to rest for a minimum of 15 minutes after the test to ensure there are no immediate post-test adverse effects.
17. If a repeat test is to be performed on the same day, allow a minimum of 30 minutes rest between tests. If it is to be performed on another day, it should be performed within one week.
18. Complete 6MWT documentation and file appropriately in the patient's medical record. Stickers (Appendix 7) may be used for this purpose. Ensure the date and time of the test, and the tester's name, signature and designation are completed. For research patients additional paperwork should be completed as per local protocol.
19. Provide recommendations for oxygen therapy and exercise capacity (Appendix 8) as appropriate.

### **6MWT Termination Criteria**

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The 6 MWT should be **stopped immediately** in the instance of:

- Onset of angina or angina-like symptoms
- Tachycardia above predicted heart rate maximum. i.e. Heart rate > (220 – age).
- Intolerable dyspnoea
- Excessive diaphoresis
- Extreme paleness/ashen appearance
- SpO<sub>2</sub> <80%. Clinical discretion by the supervising clinician should be utilised in this instance, as the test may be continued safely in some patients. If the test is stopped, recommence testing when the patient feels able or when SpO<sub>2</sub> approaches resting values. Alternatively, consider repeating the test with supplemental oxygen.
- Signs of poor perfusion including light headedness, confusion, ataxia, pallor, central cyanosis, nausea, cold clammy skin, sweating.
- Physical or verbal manifestations of severe fatigue.
- Heart rate changes that are not consistent with expectations for the patient group being tested. i.e. some patient groups may experience a blunted HR response with exercise testing include those with:

- A fixed rate pacemaker
- Prescribed Beta-blocker medication
- Heart failure
- Pulmonary hypertension

**If the test is stopped for the above reasons**, stay with and observe the patient, and use your clinical judgement to initiate the required action.

Is this a medical emergency?

- Yes → Immediately initiate local protocol for medical emergency management.
- No → Initiate clinical action as required and continue to directly monitor patient.
  - If symptoms resolve sufficiently within the duration of the 6MWT, the patient may continue the test.
  - If symptoms resolve sufficiently but outside the duration of the 6MWT, consider repeating the test at a later date/time, +/- additional safety measures (e.g. supplemental oxygen if low SpO<sub>2</sub> terminated the previous test)
  - Do symptoms worsen or fail to resolve? Initiate local protocol e.g. Initiate MERT call, contact the appropriate medical officer, or QAS if the patient fails to recover within a reasonable time frame or new symptoms develop.

### **Predicted 6 minute walk distance**

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Jenkins et al, has published the following equations for calculating predicted 6 minute walk distance in middle-aged and elderly patients (Australia).<sup>4</sup>

- Predictive equation for males:  $6MWD(m) = 867 - (5.71 \text{ age, yrs}) + (1.03 \text{ height, cm})$
- Predictive equation for females:  $6MWD(m) = 525 - (2.86 \text{ age, yrs}) + (2.71 \text{ height, cm}) - (6.22 \text{ BMI})$ .

### **Minimal Important Difference (MID)**

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For patients with chronic lung disease:

- Studies estimate that the minimal important difference (MID) for 6MWD in patients with chronic lung disease is 30m (25-33m) (95% CI 20-71m).<sup>5,6,7</sup>

For patients with Coronary artery disease:

- A study in 2011 provides an initial estimate of the MID for 6MWD in patients with coronary artery disease during cardiac rehabilitation as 25m.<sup>8</sup>

For patients with Heart Failure:

- Tager et al estimate the MID for 6MWT in HF patients to be 36m.<sup>9</sup>

For patients with PAH:

- The MID for 6MWT for those with PAH is estimated to be 25-38m.<sup>10</sup>

## **MARKETING/ COMMUNICATION**

Marketing/Communication  
Responsibility  
Marketing/Communication  
Strategy

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QCRPN

QCRPN

## **AUDIT STRATEGY**

Level of Risk Low  
Audit Strategy  
Audit Tool Attached No  
Audit Date  
Audit Responsibility  
Key Elements/Indicators/Outcomes

## **REVIEW STRATEGY**

Minor Review Date 1 Dec 2015  
Minor Review Date 2 Dec 2016  
Major Review Date Dec 2017  
Review Responsibility QCRPN members

## **PUBLISHING INFORMATION**

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Replacement For

QCRPN Functional Exercise Testing – 6 Minute Walk Test (Version 1)

Information Sources

<sup>1</sup> Holland AE et al. An official European Respiratory Society/ American Thoracic Society Technical Standard: field walking tests in chronic respiratory disease. *Eur Respir J*. 2014.

<sup>2</sup> Adsett J, Mullins R, Hwang R, Hogden A, Gbson E, Houlihan K, Tuppin M, Korczyk D, Mallitt, K, Mudge A. Repeated Six Minute Walk Tests in Patients with Chronic Heart Failure: Are They Clinically Necessary? *Eur J Cardiovasc Prev Rehabil*. 2011. 18(4): 601-6.

<sup>3</sup> Bellet, R. N., Francis, R., Jacob, J. S., Healy, K. M., Bartlett, H. J., Adams, H. J., et al. (2011). Repeated six-minute walk tests for outcome measurement and exercise prescription in outpatient cardiac rehabilitation: a longitudinal study. *Arch Phys Med Rehabil*, 92(9), 1388-1394

<sup>4</sup> Jenkins S, Cecins N, Camarri B, Williams C, Thompson P, Eastwood P. Regression equations to predict 6 minute walk distance in middle-aged and elderly adults. *Physiotherapy Theory and Practice* 2009; 25(7): 1-7.

<sup>5</sup> Redelmeier DA, Bayoumi AM, Goldstein RS, Guyatt GH. Interpreting small differences in functional lung status: the six minute walk test in chronic lung disease patients. *Am J Respir Crit Care Med* 1997; 155: 1278-1282.

<sup>6</sup> Puhan MA, Mador MJ, Held U, Goldstein R, Guyatt GH, Schunemann HJ. Interpretation of treatment changes in 6-minute walk distance in patients with COPD. *Eur Respir J* 2008; 32: 637-643.

<sup>7</sup> Holland AE, Hill CJ, Rasekaba T, Lee A, Naughton MT, McDonald CF. Updating the minimal important difference for six-minute walk distance in patients with chronic obstructive pulmonary disease. *Arch Phys Med Rehabil* 2010; 91: 221-225.

<sup>8</sup> Gremeaux V et al. Determining the Minimal Clinically Important Difference for the Six-minute Walk Test and the 200-Meter Fast-Walk Test During Cardiac Rehabilitation Program in Coronary Artery Disease Patients after Acute Coronary Syndrome. *Arch Phys Med Rehabil* 2011; 92: 611-619.

<sup>9</sup> Tager T et al. Minimum important difference for 6 minute walk distances among patients with chronic heart failure. *Int J Cardiol*. 2014. 176(1): 94-98.

<sup>10</sup> Mathai SC et al. The minimum important difference for 6 minute walk test for patients with pulmonary arterial hypertension. *Am J Respir Crit Care Med*. 2012. 186(5): 428-33.

<sup>11</sup> Sciarba F et al. Six minute walk distance in chronic obstructive pulmonary disease: reproducibility and effect of walking course layout and length. *Am J Respir Crit Care Med* 2003; 167: 1522-1527

## SEARCH INFORMATION

Key Words

Functional Exercise Testing- Six Minute Walk Test

EQulP and other Standards

Accreditation, Competency training

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**Endorsement**

Signature ..... Date .....

**Dr Peter Thomas**  
**Chairperson, Queensland Cardiorespiratory Physiotherapy Network (QCRPN)**

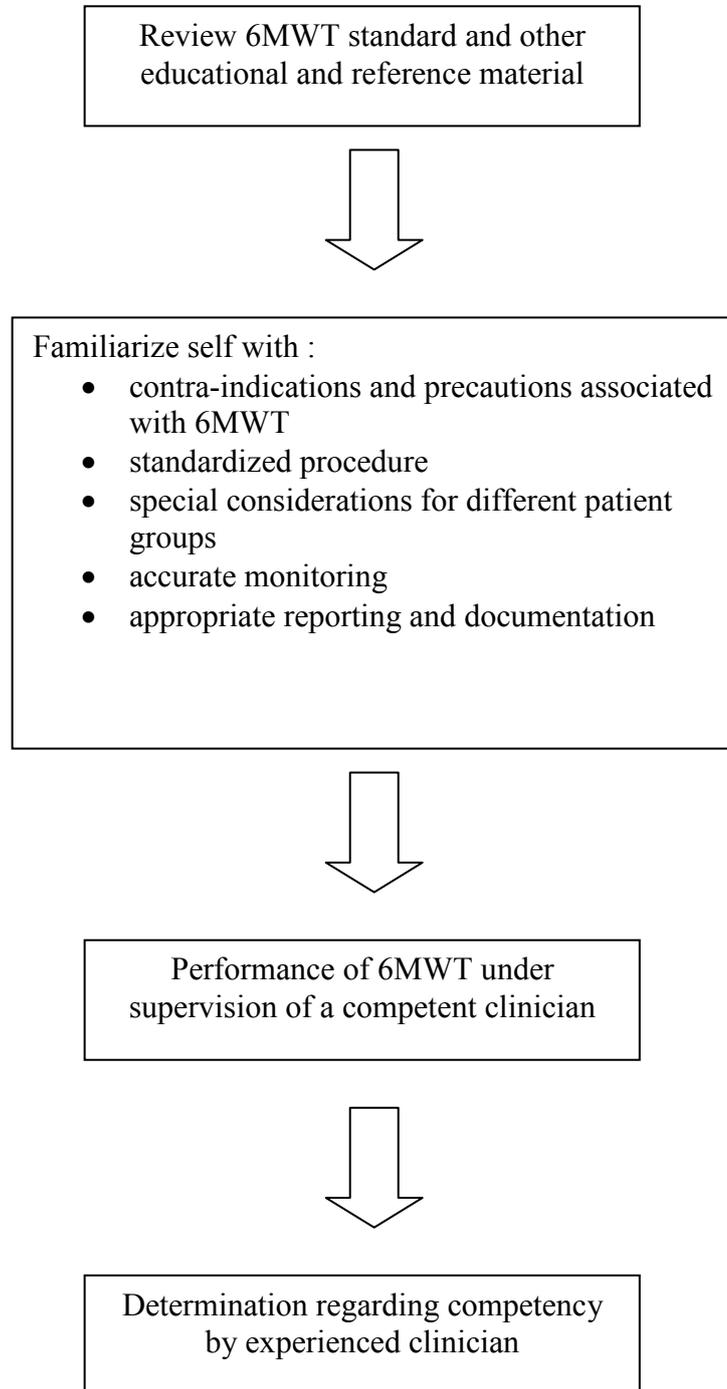
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**Approval**

Signature ..... Date .....

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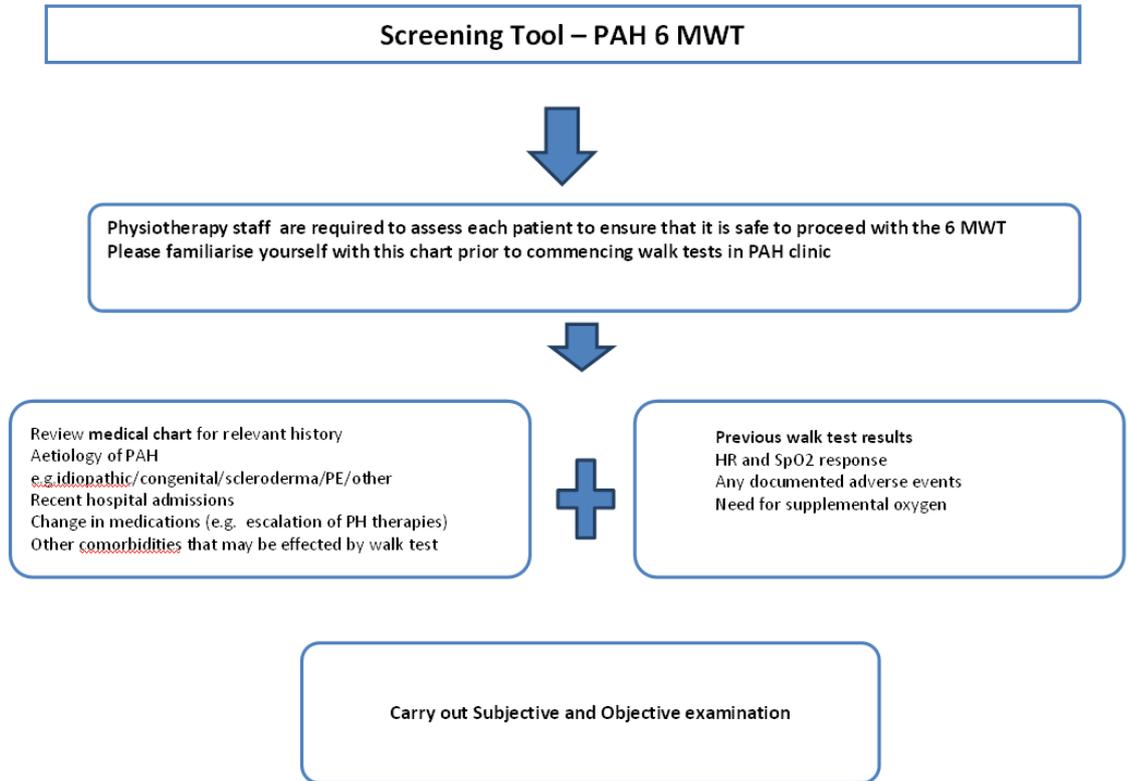
## Appendix 1. Example 6MWT Competency Procedure



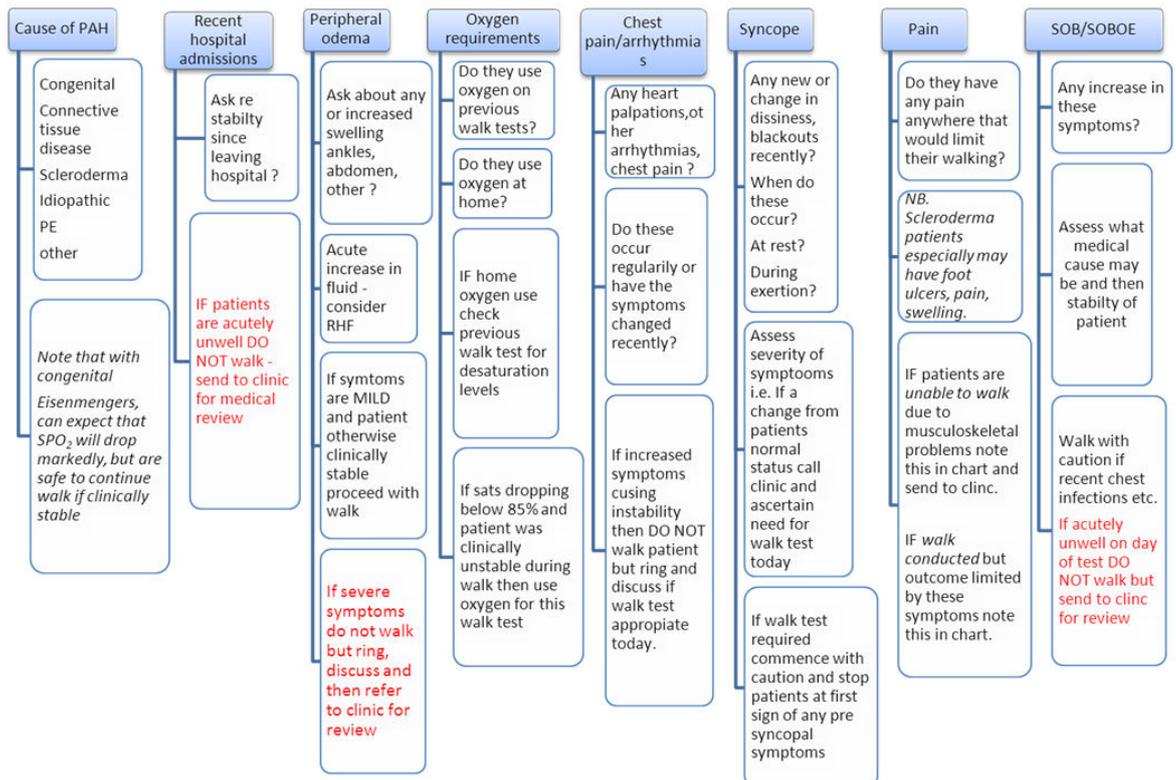
## Appendix 2. Example screening tool

The screening tool below was developed to assist clinical reasoning processes for conducting a 6MWT on patients with pulmonary arterial hypertension (PAH). Screening tools relevant to other patient groups could be developed by local services, with due consideration to specific needs and resources.

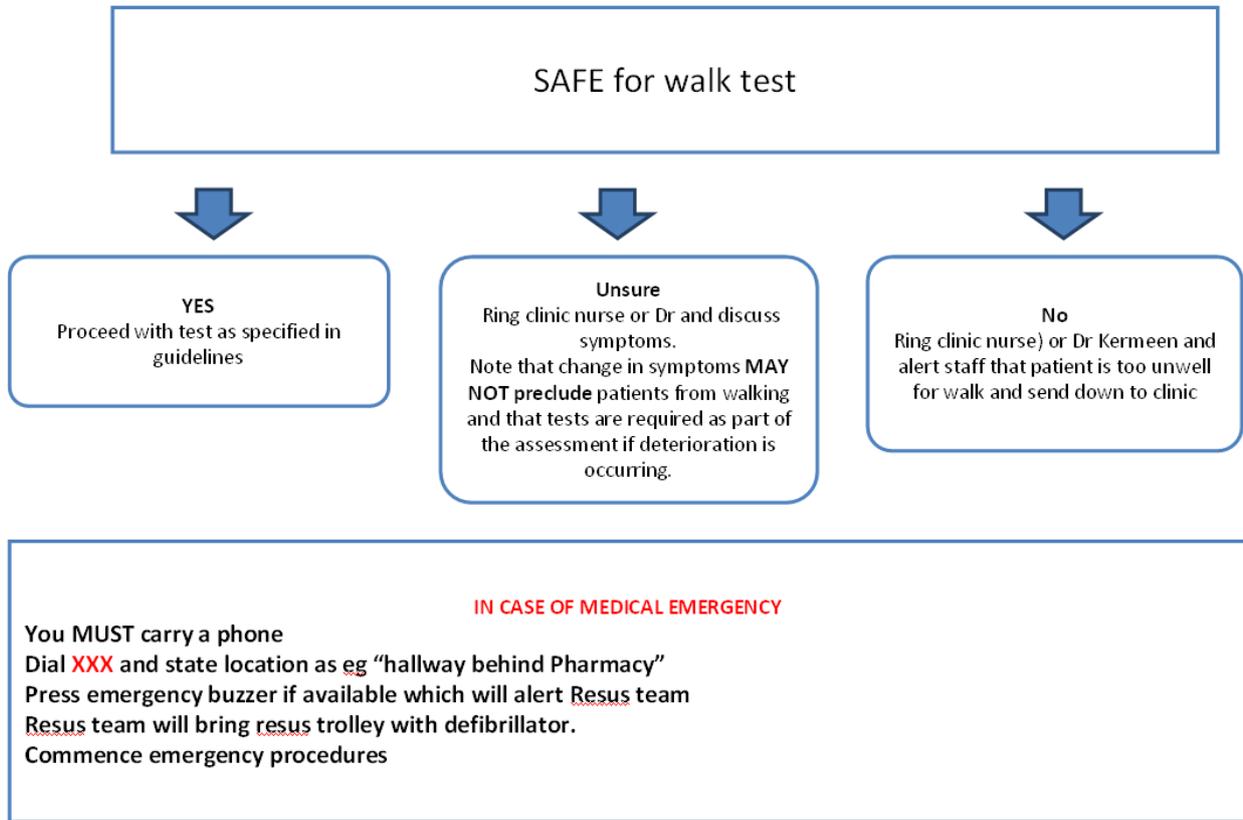
### STEP 1



### STEP 2



### STEP 3



## Appendix 3. Standardised instructions

Tip: Put the instructions on a laminated card and read them out to each patient.

### *Before the Test*

Describe the walking track to the patient and then give the patient the following instructions:

**"You are now going to do a 6 minute walk test. The object of this test is to walk as far as you can for six minutes (around the track; up and down the corridor etc... depending on your track set up) so that you cover as much ground as possible.**

**You may slow down if necessary. If you stop, I want you to continue to walk again as soon as possible. You will be regularly informed of the time and you will be encouraged to do your best. Your goal is to walk as far as possible in six minutes, but don't run or jog.**

**Please do not talk during the test unless you have a problem or I ask you a question. You must let me know if you have any chest pain or dizziness.**

**When the six minutes is up I will ask you to stop where you are. Do you have any questions?"**

*Begin the test* by instructing the patient to:

**"Start walking now."**

### *During the Test*

Monitor the patient for untoward signs and symptoms.

Use the following standard encouragements during the test:

At minute one: **"You are doing well. You have five minutes to go."**

At minute two: **"Keep up the good work. You have four minutes to go."**

At minute three: **"You are doing well. You are halfway."**

At minute four: **"Keep up the good work. You have only two minutes left."**

At minute five: **"You are doing well. You have only one minute to go."**

At minute six: **"Please stop where you are."**

### *If the patient stops during the test:*

Allow the patient to sit in a chair if they wish, and check SpO<sub>2</sub> and heart rate. Ask the patient why they stopped. Record the time the patient is stopped (keep the 6MWT time running). Give the following encouragement (repeat every 30 seconds if necessary): "Please resume walking whenever you feel able."

## Appendix 4. Modified Borg Dyspnoea Scale

### *Patient Instructions:*

“This is a scale that asks you to rate the difficulty of your breathing. It starts at number 0 where your breathing is causing you no difficulty at all and progresses through to number 10 where your breathing difficulty is maximal.”

“How much difficulty is your breathing causing you right now?”

0	Nothing at all
0.5	Very, very slight (just noticeable)
1	Very slight
2	Slight
3	Moderate
4	Somewhat severe
5	Severe
6	
7	Very severe
8	
9	Very, very severe (almost maximal)
10	Maximal

## Appendix 5. Instructions for Borg Rating of Perceived Exertion (RPE)

While doing physical activity, we want you to rate your perception of exertion. This feeling should reflect how heavy and strenuous the exercise feels to you, combining all sensations and feelings of physical stress, effort, and fatigue.

Do not concern yourself with any one factor such as leg pain or shortness of breath, but try to focus on your total feeling of exertion.

Look at the rating scale below while you are engaging in an activity; it ranges from 6 to 20, where 6 means "no exertion at all" and 20 means "maximal exertion." Choose the number from below that best describes your level of exertion.

This will give you a good idea of the intensity level of your activity, and you can use this information to speed up or slow down your movements to reach your desired range.

Try to appraise your feeling of exertion as honestly as possible, without thinking about what the actual physical load is. Your own feeling of effort and exertion is important, not how it compares to other people.

**Look at the scales and the expressions and then give a number.**

6	<b>No exertion at all</b>
7	
	<b>Extremely light (7.5)</b>
8	
9	<b>Very light</b>
10	
11	<b>Light</b>
12	
13	<b>Somewhat hard</b>
14	
15	<b>Hard (heavy)</b>
16	
17	<b>Very hard</b>
18	
19	<b>Very very hard</b>
20	<b>Maximal exertion</b>

Notes:

- 9 corresponds to "very light" exercise. For a healthy person, it is like walking slowly at his or her own pace for some minutes
- 13 on the scale is "somewhat hard" exercise, but it still feels OK to continue.
- 17 "very hard" is very strenuous. A healthy person can still go on, but he or she really has to push him- or herself. It feels very heavy, and the person is very tired.
- 19 on the scale is an extremely strenuous exercise level. For most people this is the most strenuous exercise they have ever experienced.

© Gunnar Borg, 1970, 1985, 1994

# APPENDIX 6. Record Templates for 6 Minute Walk Tests

 <p><b>Queensland Government</b></p> <p style="text-align: center;"><b>SIX MINUTE WALK TEST RECORDING SHEET</b></p> <p><b>FACILITY:</b> .....</p>	<p>(Affix identification label here)</p> <p>URN:</p> <p>Family name:</p> <p>Given name(s):</p> <p>Address:</p> <p>Date of birth: <span style="float: right;">Sex: <input type="checkbox"/> M <input type="checkbox"/> F</span></p>						
<p><input type="checkbox"/> Medical history checked</p> <p><input type="checkbox"/> Medical clearance provided by ..... for the patient to participate in exercise testing.</p> <p><input type="checkbox"/> No contraindications identified to 6MWT</p> <p><b>Contraindications to 6MWT:</b></p> <p><input type="checkbox"/> Unstable angina or myocardial infarction during the previous 3-5 days (Note: Stable angina is not an absolute contraindication but the test should be performed after administration of anti-angina medication and with rescue nitrate available.)</p> <p><input type="checkbox"/> Resting heart rate &gt; 120 beats / min after 10 minutes rest (relative contraindication)</p> <p><input type="checkbox"/> Systolic blood pressure &gt; 180 mm Hg +/- diastolic blood pressure &gt; 100 mm Hg (relative contraindication)</p> <p><input type="checkbox"/> Resting SpO<sub>2</sub> &lt; 80% on room air or on prescribed level of supplemental oxygen.</p> <p><input type="checkbox"/> Heart failure NYHA IV unless clearance provided by cardiologist</p> <p><input type="checkbox"/> Exercise induced arrhythmia unless clearance provided by cardiologist</p> <p><input type="checkbox"/> Physical disability preventing safe performance.</p> <p><b>Predicted HR Max</b> calculated (220-age):</p> <p><input type="checkbox"/> Prescribed inhaled bronchodilator medication taken within one hour of commencement of test, or on arrival for testing.</p> <p><b>Predicted 6MWT in middle-aged and elderly patients (Australia):</b></p> <p><input type="checkbox"/> Males: 6MWD(m) = 867 – (5.71 age, yrs) + (1.03 height, cm)</p> <p><input type="checkbox"/> Females: 6MWD(m) = 525 – (2.86 age, yrs) + (2.71 height, cm) – (6.22 BMI).</p>							
<p><b>6MWT 1</b></p> <p>Date: _____ Time: _____</p>							
<p>Supplemental oxygen: _____ Gait aid: _____</p>							
	Time (mins)	Blood pressure	SpO <sub>2</sub>	Heart rate	Dyspnoea	Distance walked	Rests/Limiting factors/Comments
	Rest						
	1						
	2						
	3						
	4						
	5						
	6						
	Recovery 1						
	2						
	3						
	4						
	5						
<p><b>Distance:</b></p> <p>Was test terminated? <input type="checkbox"/> No <input type="checkbox"/> Yes. If yes: when? .....</p> <p><b>6MWT Termination Criteria:</b></p> <p><input type="checkbox"/> Chest pain or angina-like symptoms</p> <p><input type="checkbox"/> Evolving mental confusion, light-headedness or incoordination</p> <p><input type="checkbox"/> Intolerable dyspnoea, unrelieved by rest.</p> <p><input type="checkbox"/> Abnormal gait pattern (leg cramps, staggering, ataxia)</p> <p><input type="checkbox"/> Physical or verbal severe fatigue</p> <p><input type="checkbox"/> Heart rate &gt; Predicted HR max.</p> <p><input type="checkbox"/> Persistent SpO<sub>2</sub> &lt; 80% (Note: pending clinical presentation)</p> <p><input type="checkbox"/> Other clinically warranted reason: .....</p>							
Signature: _____			Printed name: _____			Designation: _____	



**Queensland  
Government**

# SIX MINUTE WALK TEST RECORDING SHEET

(Affix identification label here)

URN:

Family name:

Given name(s):

Address:

Date of birth:

Sex:  M  F

FACILITY: .....

- Medical history checked  
 Medical clearance provided by ..... for the patient to participate in exercise testing.

No contraindications identified to 6MWT

**Contraindications to 6MWT:**

- Unstable angina or myocardial infarction during the previous 3-5 days (Note: Stable angina is not an absolute contraindication but the test should be performed after administration of anti-angina medication and with rescue nitrate available.)
- Resting heart rate > 120 beats / min after 10 minutes rest (relative contraindication)
- Systolic blood pressure > 180 mm Hg +/- diastolic blood pressure > 100 mm Hg (relative contraindication)
- Resting SpO2 < 80% on room air or on prescribed level of supplemental oxygen.
- Heart failure NYHA IV unless clearance provided by cardiologist
- Exercise induced arrhythmia unless clearance provided by cardiologist
- Physical disability preventing safe performance.

**Predicted HR Max** calculated (220-age):

- Prescribed inhaled bronchodilator medication taken within one hour of commencement of test, or on arrival for testing.

**Predicted 6MWT in middle-aged and elderly patients (Australia):**

- Males:  $6MWD(m) = 867 - (5.71 \text{ age, yrs}) + (1.03 \text{ height, cm})$
- Females:  $6MWD(m) = 525 - (2.86 \text{ age, yrs}) + (2.71 \text{ height, cm}) - (6.22 \text{ BMI})$

**6MWT 2**

Date:

Time:

Supplemental oxygen:

Gait aid:

Time (mins)	Blood pressure	SpO <sub>2</sub>	Heart rate	Dyspnoea	Distance walked	Rests/Limiting factors/Comments
Rest						
1						
2						
3						
4						
5						
6						
Recovery 1						
2						
3						
4						
5						

**Distance:**

Was test terminated?  No  Yes. If yes: when? .....

**6MWT Termination Criteria:**

- Chest pain or angina-like symptoms
- Evolving mental confusion, light-headedness or incoordination
- Intolerable dyspnoea, unrelieved by rest.
- Abnormal gait pattern (leg cramps, staggering, ataxia)
- Physical or verbal severe fatigue
- Heart rate > Predicted HR max.
- Persistent SpO2 <<80% (Note: pending clinical presentation)
- Other clinically warranted reason: .....

Signature:

Printed name:

Designation:



## Appendix 8. Exercise prescription from 6MWD in patients with COPD

This summary is derived from information published in the Pulmonary Rehab Toolkit – Exercise Training. Please refer to this guideline for further detail.

The minimum suggested duration for a lower limb endurance exercise session is 30 minutes (e.g. 30 minutes of walking or cycling). If a patient is very debilitated, the duration of the initial exercise sessions can be shortened (eg. to 10 minutes). The duration should be built up to 30 minutes as soon as tolerated.

Frequency of lower limb endurance training should be 5 – 7 days /week.

Exercise may be continuous or completed in an interval format. Continuous training is exercise at a prescribed intensity for the duration of the exercise period. Interval training is brief periods of high intensity exercise alternated with short periods of recovery (either rest or low intensity exercise).

Interval training may be preferable for patients who cannot sustain the prescribed intensity for the required duration of continuous exercise (i.e. due to severe dyspnoea, marked oxygen desaturation during exercise, signs of significant fatigue or presence of symptoms from co-morbid conditions, eg claudication pain).

**Walking training intensity:** It is recommended that for walking training a starting intensity should be 80% of the average 6MWT speed. Treadmill speeds may need to be 0.5-1.0kph slower than calculated. A minimum recommended treadmill speed is 2.0kph.

**Cycle training intensity:** The recommended intensity when prescribing cycle ergometry training is at least 60% of the peak work rate achieved on an incremental symptom-limited cycle ergometry test. However, clinically many patients do not undergo a cycle ergometry test.

Several published equations are available to estimate the initial work rate for prescribing cycle ergometry training based on the performance of a patient with COPD on the 6MWT or ISWT. However, for an individual patient, the different equations may give different estimates of peak work rate and thus different intensities for training (prescribed at a %peak work rate). These equations have not been prospectively validated and their utility in the clinical setting has not yet been tested.

In many settings, exercise intensity may be titrated based on achieving a modified BORG dyspnoea score or rate of perceived exertion score (RPE) of 3 to 4 on the 0-10 scale.