Advanced Life Support (ALS) Paramedic

Physical Capacity Testing Protocols
Pre-Employment Candidate Pack

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AV Physical Capacity Testing Protocols
Version 1 – 04/09/2015
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**Physical Capacity Testing Requirements for ALS Paramedics**

Taking into account the job demands, the following table provides an overview of the Physical Capacity Testing (PCT) Regime for this role.

<table>
<thead>
<tr>
<th>ALS Paramedic</th>
<th>Aerobic</th>
<th>Endurance</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5</td>
<td>6 7 8 9 10 11</td>
<td></td>
</tr>
</tbody>
</table>

**Light blue**  
Medical clearance required but no specific PCT

**Medium blue**  
Medical clearance required plus PCT baseline

**Dark blue**  
Medical clearance required plus advanced PCT Baseline plus advanced elements

### Physical Capacity Tests - ALS

1. Aerobic Step Test
2. Double Leg Hold
3. Neck Hold
4. Core Strength A - Timed Prone Hold
5. Core Strength B - Dynamic Prone Hold *(Not required for ALS)*
6. Static Lift - 245mm
7. Static Lift - 600mm
8. Static Lift - 950mm
9. Static Push - 950mm
10. Static Pull - 950mm
11. Grip Strength
Preparation for Tests

The Ambulance Victoria Physical Capacity Testing for ALS Paramedics involves 10 tests. The tests involve vigorous physical exertion, which in some cases will be maximal in nature. Movements include stepping, balancing, holding and generating maximal strength in certain muscle groups.

Muscles, ligaments, tendons and joints may be placed under high stress and there is an inherent risk of injury with such testing. To mitigate these risks, some suggestions are outlined below:

1. Avoid heavy strenuous exercise for the 24 hours prior to testing.
2. Wear appropriate clothing for the conditions (e.g. shorts/track pants and t-shirt/singlet/sports top) and non-slip athletic footwear with laces securely fastened.
3. Remove restrictive jewellery, watches, bracelets or hanging earrings that may get caught in equipment.
4. Testing will not be conducted if the applicant is suffering any injury or illness that is likely to worsen as a result of participation or if they are unwell/not in good general health.
5. A warm-up is conducted prior to the commencement of testing. This would typically involve a 5-minute period of light exercise incorporating a series of stretches for the upper and lower body.

Medical Clearance

A medical clearance is required prior to the commencement of the Physical Capacity Testing. A General Health Practitioner will provide this clearance. You are encouraged to discuss any concerns with the General Health Practitioner during the medical clearance screening prior to undertaking the testing process.

Informed Consent

A consent form must be completed and signed prior to the commencement of the Physical Capacity Testing. You will be made fully aware of all of the tests you are about to perform.
Physical Capacity Testing Protocols - Advanced Life Support (ALS) Paramedics

1. Aerobic Step Test

**Purpose and rationale:**
This test provides a measure of cardiovascular and endurance fitness. Cardiovascular endurance is a specific requirement of many ALS paramedic tasks. Cardiovascular endurance ensures they can maintain periods of sustained intensity without suffering from high levels of fatigue.

**Procedure:**
This test requires the subject to step up and down on a 413mm step at a gender-determined rate for 3 minutes (The metronome is set to 88 beats per minute (22 steps) for females and 96 beats per minute (24 steps) for males. The heart rate (HR) response to exercise predicts the subject’s aerobic capacity. The recovery heart rate is also taken to determine the subject’s level of health and fitness. As soon as the test is completed the subject will sit on a chair to rest and recover. The recovery HR is taken whilst sitting.

**Pass Marks:**
- Predicted VO2 MAX – *Fair* age/gender related Norms
- Heart Rate Recovery – *Fair* rating
Estimated VO2 Max Scoring Table

<table>
<thead>
<tr>
<th>Condition</th>
<th>Recovery Rate Number</th>
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<tr>
<td>Poor</td>
<td>Less than 2</td>
</tr>
<tr>
<td>Fair</td>
<td>2 to 2.9</td>
</tr>
<tr>
<td>Average</td>
<td>3 to 3.9</td>
</tr>
<tr>
<td>Good</td>
<td>4 to 5.9</td>
</tr>
<tr>
<td>Excellent</td>
<td>Above 6</td>
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Heart Rate Recovery Scoring Table

<table>
<thead>
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<tbody>
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Adapted by permission from Cooper Institute, Physical fitness assessments and norms for adults and law enforcement (Dallas, TX: The Cooper Institute), 24. For more information: www.cooperinstitute.org.
2. Double Leg Hold

**Purpose and rationale:**

To test the endurance of the lumbar extensors and gluteal muscles. Carrying, bending and lifting endurance is necessary for injury prevention while undertaking a range of ALS paramedic tasks.

The ALS paramedic’s tasks related to this test include:

- Lifting bags from the vehicle and carrying to the scene
- Lifting and positioning equipment while attending to a patient
- Lifting the stretcher loaded with a patient.
- Lifting the spine board at ground level.

**Procedure:**

1. The subject lies prone on the plinth, with their chest on the plinth and their legs over the end of the plinth. Position their body so that their ASIS (Anterior Superior Iliac Spine) is exactly at the end of the plinth.
2. The subject may hold on to the plinth with their hands for stability.
3. The subject is asked to lift both legs simultaneously, with the knees straight until their hips are flexed 10 degrees. Their feet, heels and knees must remain together.
4. Ask the subject to maintain the double leg lift position “As long as you can or until I say stop.”
5. The test concludes when the subject lets their legs down or when the pre-determined time is reached.

**Pass mark:**

- The recommended endurance time is **120 seconds**
3. Supine Neck Hold

Purpose and rationale:
To test the endurance of the neck flexor muscles. Carrying, bending and lifting endurance is necessary for injury prevention while undertaking a range of ALS paramedic tasks.

The ALS paramedic tasks related to this test include:

- Lifting bags from the vehicle and carrying to the scene
- Lifting and positioning equipment while attending to a patient
- Attending to the patient whilst adopting awkward postures.

Procedure:

1. The subject lies supine on the plinth, with their head off the end of the plinth. The assessor must support the subject’s head with their hands.
2. Position the subject’s body so that their shoulders are above the end of the plinth.
3. The assessor positions the subject’s neck in the neutral position.
4. The assessor advises that subject that they are going to remove their hands, and the subject will be asked to maintain the neutral neck position for “As long as you can or until I say stop.”
5. The assessor lowers their hands away so that they are no longer supporting their head. The assessor will keep their hands in a ready position to allow the assessor to provide immediate support to the subject’s head when the subject fatigues.
6. Ask the subject to maintain the supine neck hold position as long as they are able or until 30 seconds passes.
7. The test concludes when the subject lets their head down, when control of chin position is lost or when the pre-determined time is reached.

Pass mark

- The recommended endurance time is 30 seconds
4. Core Strength A - Timed Prone Hold

**Purpose and rationale:**

This test measures abdominal muscle strength and endurance for core stability and back support. Core stability is an important component in many tasks that the ALS paramedic is required to perform.

The ALS paramedic tasks related to this test include:

- Attending to patient in a cramped/inaccessible space
- Extrication to stretcher using spine board and evacuation mat
- Moving a patient on a stretcher
- Lifting the shock stand whilst in the ambulance.

**Procedure:**

The subject balances their weight evenly on their wrists (hands clasped together directly under their chin), elbows and feet (between 100mm and 200mm apart).

**Pass Mark:**

- **75 seconds:** Pass, 90 seconds: Desirable
6. Static Lift - 245mm

Purpose and rationale:
This test measures the strength of various muscle groups involved in lifting, including gluteals, quadriceps, shoulders and the lower back.

This test is designed to assess the subject’s ability to lift at low levels. The 245mm height lift test represents a spine board team lift.

The ALS paramedic tasks related to this test include:

- Lifting and positioning patients and patients limbs at low heights
- Lifting patients on a spine board as a team lift.

Procedure:

1. The force gauge is attached to a cable from the floor and adjusted to the required height of 245mm.
2. The subject stands with their feet at shoulder width apart.
3. After a warm up, the subject is required to perform a 50% maximum lift at the 245mm height to get a feel for the test. The subject is then required to perform a safe maximum lift from the 245mm height. This force is exerted for five seconds. Note that the computer software will record the force exerted over a five second period.
4. After a comfortable rest period is achieved or a maximum rest period of 30 seconds, the same procedure is followed for the second attempt, and then again for the final attempt.
5. Correct manual handling techniques must be maintained throughout the test.

Pass Mark:

- **42kg**: Pass, 61kg: Desirable
7. Static Lift - 600mm

Purpose and rationale:

This test measures the strength of various muscle groups involved in lifting, including gluteals, quadriceps, shoulders and the lower back.

This test is designed to assess the subject’s ability to lift at medium levels. The 600mm height lift test represents a mid-stretcher team lift.

The ALS paramedic tasks related to this test include:

- Lifting and positioning patients and patients limbs at medium heights
- Changing the height of the stretcher when loaded with a patient.

Procedure:

1. The force gauge is attached to a cable from the floor and adjusted to the required height of 600mm
2. The subject stands with their feet at shoulder width apart.
3. After a warm up, the subject is required to perform a 50% maximum lift at the 600mm height to get a feel for the test. The subject is then required to perform a safe maximum lift from the 600mm height. This force is exerted for five seconds. Note that the computer software will record the force exerted over a five second period.
4. After a comfortable rest period is achieved or a maximum rest period of 30 seconds, the same procedure is followed for the second attempt, and then again for the final attempt.
5. Correct manual handling techniques must be maintained throughout the test.

Pass Mark

- 41kg: Pass, 57kg: Desirable
8. Static Lift - 950mm

Purpose and rationale:

This test measures strength of various muscle groups involved in lifting, including gluteals, quadriceps, shoulders and the lower back.

This test is designed to assess the subject’s ability to lift at high levels. The 950mm height lift test represents a full stretcher height team lift/load.

The ALS paramedic tasks related to this test include:

- Lifting and positioning patients and patients limbs at high heights
- Lifting and loading of the stretcher when loaded with a patient.

Procedure:

1. The force gauge is attached to a cable from the floor and adjusted to the required height of 950mm.
2. The subject stands with their feet at shoulder width apart.
3. After a warm up, the subject is required to perform a 50% maximum lift at the 950mm height to get a feel for the test. The subject is then required to perform a safe maximum lift from the 950mm height. This force is exerted for five seconds. Note that the computer software will record the force exerted over a five second period.
4. After a comfortable rest period is achieved or a maximum rest period of 30 seconds, the same procedure is followed for the second attempt, and then again for the final attempt.
5. Correct manual handling techniques must be maintained throughout the test.

Pass mark

- 36kg: Pass, 56kg: Desirable
9. Static Push - 950mm

Purpose and rationale:

This test measures upper body pushing strength. Pushing strength is an important component of the tasks that are required of an ALS paramedic.

The ALS paramedic tasks related to this test include:

- Pushing equipment, stabilizing unsteady patients, moving patients into ambulance
- Pushing stretchers over various terrain, including up sloping ground, over obstacles, through gravel and grass
- Pushing patients in wheelchairs.

Procedure:

1. The force gauge is positioned on one end to the wall and the other end to the modified handle.
2. The subject stands with one foot in front of the other at about 200mm apart.
3. After a warm up, the subject is required to perform a 50% maximum push to get a feel for the test. The subject is then required to perform a safe maximum push. This force is exerted for five seconds. Note that the computer software will record the force exerted over a five second period.
4. After a comfortable rest period is achieved or a maximum rest period of 30 seconds, the same procedure is followed for the second attempt, and then again for the final attempt.
5. Correct manual handling techniques must be maintained throughout the test.

Pass mark

- **21kg: Pass, 32kg: Desirable**
10. Static Pull - 950mm

**Purpose and rationale:**

This test measures upper body pulling strength. Pulling strength is an important component of the tasks that are required of an ALS paramedic.

The ALS paramedic tasks related to this test include:

- Pulling equipment, stabilizing unsteady patients, moving patients into ambulance
- Pulling stretchers over various terrain, including up sloping ground, over obstacles, through gravel and grass
- Pulling a patient in a wheelchair.

**Procedure:**

1. The force gauge is attached using the supplied strap and hook to a fixed bollard/post and the other end to the modified handle.
2. The subject stands with one foot in front of the other at about 200mm apart.
3. After a warm up, the subject is required to perform a 50% maximum pull to get a feel for the test. The subject is then required to perform a safe maximum pull. This force is exerted for five seconds. Note that the computer software will record the force exerted over a five second period.
4. After a comfortable rest period is achieved or a maximum rest period of 30 seconds, the same procedure is followed for the second attempt, and then again for the final attempt.
5. Correct manual handling techniques must be maintained throughout the test.

**Pass mark**

- **20kg:** Pass, **29kg:** Desirable
11. Grip Strength

Purpose and rationale:

The purpose of this test is to measure the maximum isometric strength of the hand and forearm muscles. Handgrip strength is important for many tasks performed by the ALS paramedic. Also, as a general rule people with strong hands tend to be strong elsewhere, so this test is often used as a general test of strength.

The ALS paramedic tasks related to this test include:

- Gripping bags and equipment, holding unsteady patients, moving patients
- Gripping and pulling stretchers over various terrain, including up sloping ground, over obstacles, through gravel and grass
- Gripping and restraining wheelchairs on slopes.

Procedure:

1. The subject is seated and holds the dynamometer in the dominant hand to be tested, with the arm at right angles and the elbow by the side of the body.
2. The handle of the dynamometer is adjusted so the base should rest on the thumb pad (heel of palm), while the handle should rest on the pads of the index and middle finger.
3. When ready the subject squeezes the dynamometer with maximum isometric effort, which is maintained for about five seconds. No other body movement is allowed.
4. After a comfortable rest period is achieved or a maximum rest period of 30 seconds, the same procedure is followed for the second attempt, and then again for the final attempt.

Pass mark

- 28kg: Pass, 38kg: Desirable