

<b>Title</b>	<b>Demonstrate knowledge of human anatomy, physiology and health risk factors</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>13</b>

<b>Purpose</b>	People credited with this standard are able to: demonstrate knowledge of structural anatomy; explain the structure, properties and function of muscle; explain the nervous system and its functions; explain the cardiovascular system and its functions; explain the respiratory system and its functions; demonstrate knowledge of health risk factors and common conditions; and, describe the acute physiological responses and chronic physiological adaptations of the body's systems to exercise.
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<b>Classification</b>	Exercise > Human Anatomy, Physiology and Nutrition
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<b>Available grade</b>	Achieved
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### Guidance Information

- 1 Recommended skills and knowledge: Unit standard 30636, *Demonstrate knowledge of the human body and its movement during exercise and stretching.*
- 2 All learning and assessment within this unit standard must be carried out in accordance with the following, as relevant to their role:
  - relevant legislation including Health and Safety at Work Act 2015, Privacy Act 1993, Consumer Guarantees Act 1993, Accident Compensation Act 2001, and any subsequent amendments;
  - guidelines and codes of practice applicable to this standard include Code of Ethical Practice endorsed by Exercise New Zealand;
  - organisational policies and procedures including Emergency Action Plans (EAPs) and Standard Operating Procedures (SOPs).

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### Outcomes and performance criteria

#### Outcome 1

Demonstrate knowledge of structural anatomy.

**Performance criteria**

1.1 Identify the location of muscles of the human body.

Range muscles include but are not limited to – pectoralis major, pectoralis minor, trapezius, deltoid, latissimus dorsi, sternocleidomastoid, erector spinae, rhomboid, teres major, teres minor, infraspinatus, supraspinatus, subscapularis, biceps brachii, brachialis, triceps, wrist flexors, wrist extensors, rectus abdominus, serratus anterior, obliques, transverse abdominis, quadratus lumborum, multifidus, gluteus maximus, gluteus medius, piriformis, tensor fascia latae, rectus femoris, vastus medialis, vastus lateralis, sartorius, adductor magnus, adductor longus, adductor brevis, gracilis, semitendinosus, semimembranosus, biceps femoris, gastrocnemius, soleus, tibialis anterior, extensor hallucis longus.

1.2 Describe anatomical terms providing examples of their use.

Range inferior, superior, distal, proximal, lateral, medial.

1.3 Describe the fascial system and its functions.

1.4 Describe the human skeleton in terms of function.

Range bone development, bone growth and repair, loss of bone mass, structure of spine, protection.

1.5 Describe the structure of tendons and ligaments and their functions.

**Outcome 2**

Explain the structure, properties and functions of muscle.

**Performance criteria**

2.1 Describe the types of muscle.

2.2 Explain the structure of skeletal muscle.

2.3 Explain the major biomechanical properties of skeletal muscle.

2.4 Explain the types and functions of skeletal muscle fibres.

2.5 Explain the steps resulting in muscle action.

2.6 Explain force regulation in skeletal muscle.

2.7 Describe the roles of muscles during a movement.

Range agonist, antagonist, synergist, fixator.

2.8 Explain the relationship between force, velocity, and power in movement.

- 2.9 Explain the different energy systems and their use by the body.  
Range aerobic, anaerobic, lactic.
- 2.10 Identify the function of the lymphatic system and the effect that muscles have on it.

### **Outcome 3**

Explain the nervous system and its functions.

#### **Performance criteria**

- 3.1 Explain the functions and organisation of the nervous system.
- 3.2 Explain the structure and function of nerves.
- 3.3 Explain the components and function of the sensory pathways of the central nervous system.

### **Outcome 4**

Explain the cardiovascular system and its functions.

#### **Performance criteria**

- 4.1 Explain the anatomy of the cardiovascular system and the pathway of blood flow through the body.
- 4.2 Explain the physiology of the cardiovascular system.
- 4.3 Explain cardiac output and blood pressure and their determinants.

### **Outcome 5**

Explain the respiratory system and its functions.

#### **Performance criteria**

- 5.1 Explain the anatomy of the respiratory system.
- 5.2 Explain the physiology of the respiratory system.
- 5.3 Explain the mechanics of ventilation.
- 5.4 Explain the transport of gases throughout the body.

### **Outcome 6**

Demonstrate knowledge of health risk factors and common conditions.

**Performance criteria**

- 6.1 Describe key health risk factors including modifiable and non-modifiable factors.
- 6.2 Identify common conditions and their symptoms and describe the impact that the symptoms have on a participant's ability to exercise.
- 6.3 Describe the relationship between health risk factors and common conditions.
- 6.4 Describe the impact medications can have on a participant's ability to exercise.
- 6.5 Describe how pregnancy impacts a participants' ability to exercise.

Range precautions, contra-indicators

**Outcome 7**

Describe the acute physiological responses and chronic physiological adaptations of the body's systems to exercise.

**Performance criteria**

- 7.1 Identify undesirable responses that may occur within a single training bout.
- 7.2 Explain potential reasons for the undesirable responses and identify possible actions to rectify.
- 7.3 Describe indicators of excessive exercise stress and the actions to be taken when excessive stress is detected.
- 7.4 Describe signs and symptoms of poor adaptation to training.
- 7.5 Explain potential reasons for poor adaptation and identify actions to rectify.
- 7.6 Describe the effects of commencing, sustaining and ceasing types of training in terms of acute physiological responses.

Range immediate responses, long term responses.

- 7.7 Describe the effects of repeated performance of certain types of training in terms of chronic physiological adaptations over time.

<b>Planned review date</b>	31 December 2022
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**Status information and last date for assessment for superseded versions**

Process	Version	Date	Last Date for Assessment
Registration	1	23 November 2017	N/A

<b>Consent and Moderation Requirements (CMR) reference</b>	0099
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

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### Comments on this unit standard

Please contact Skills Active Aotearoa Limited [info@skillsactive.org.nz](mailto:info@skillsactive.org.nz) if you wish to suggest changes to the content of this unit standard.