



Australian Government

Department of Education, Employment and Workplace Relations

ACMEQU403A Relate musculoskeletal structure to horse movement

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This Unit of Competency covers the process of identifying equine musculoskeletal structural characteristics and relating these to the impact on horse movement.

Application of the Unit

The Unit is applicable to the equine industry where it may be necessary to determine and relate the structural characteristics of the equine musculoskeletal system to horse movement and communicate findings to others. In addition to legal and ethical responsibilities, all Units of Competency in the ACM10 Animal Care and Management Training Package have the requirement for animals to be handled gently and calmly. The individual is required to exhibit appropriate care for animals so that stress and discomfort is minimised.

Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this Unit at the time of publication.

Pre-Requisites

There are no pre-requisite Units for this competency standard.

Employability Skills Information

This Unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a Unit of Competency.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Determine structural characteristics of the equine musculoskeletal system	1.1 Terminology describing the anatomical and physiological features and planes of the body is interpreted 1.2 The <i>operation of the musculoskeletal system</i> in relation to body stability, movement, power and stamina, is determined 1.3 <i>Structure and types of bones and joints</i> are identified, and related to purpose 1.4 <i>Structure and types of soft tissues</i> is determined, as well as the relationship of ligaments and tendons to the musculoskeletal system
2 Locate equine muscles and supporting tissues related to equine locomotion, power and stamina and determine their function	2.1 Deep and superficial muscles of significance to power and locomotion are located 2.2 Muscle actions, origin and insertion points are defined 2.3 Tendons and ligaments of significance to power and locomotion are identified
3 Define changes in the equine musculoskeletal system due to growth and performance	3.1 <i>Changes to bone</i> due to age, exercise, ailments and injury are determined 3.2 <i>Changes to soft tissues</i> as a result of growth, exercise, ailments and injury are determined 3.3 <i>Impact of overtraining and injury</i> on the musculoskeletal system is identified 3.4 <i>Changes to hooves and feet</i> that can occur as a result of growth, exercise, ailments and injury are identified 3.5 Outcomes of findings using anatomical, physiological and industry terminology are communicated to <i>others</i>

Required Skills and Knowledge

This section describes the skills and knowledge required for this Unit.

Required skills include:

Ability to:

- analyse and solve problems using available information and resources including recording information and prioritising daily tasks
- apply interpersonal skills to work with others and relate to people from a range of cultural, social and religious backgrounds and with a range of physical and mental abilities
- communicate effectively with others, including questioning, active listening, asking for clarification and consulting with or seeking advice from other relevant persons
- consult clearly and precisely with other equine service providers, horse owners and others
- document and report using appropriate terminology
- employ safe and environmentally responsible organisational systems and procedures when working with and handling horses
- follow sequenced written instructions; record accurately and legibly information collected; and select and apply procedures to a range of defined tasks
- identify evidence of musculoskeletal changes that have occurred due to age, performance, ailments and injury
- identify musculoskeletal features that influence movement, power and stamina
- identify origin and insertion points of muscles on horses and models
- identify hoof and foot structures and changes that occur due to growth, exercise, ailments and injury
- identify prominent bones, structures, muscle groups, ligaments and tendons through palpation
- identify sensitive areas on surface anatomy which if handled may result in the horse behaving in a manner dangerous to itself or the handler
- interpret and respond appropriately to horse behaviour
- locate palpable muscles relevant to locomotion, power and stamina on surface anatomy of live horses
- maintain the highest standards of hygiene and infection control at all times to reduce the risk of infection and cross-infection; considering zoonotic and exotic disease possibilities (biosecurity)
- numeracy skills to estimate, calculate and record routine workplace elements
- read and follow required policies and procedures, including OHS, infection control and waste management
- read and interpret anatomical references, diagrams and other documents relevant to the musculoskeletal system of horses
- use and interpret terminology used to describe the planes of the body and to orientate anatomical features
- use safe manual handling techniques and/or equipment

- use safe, hygienic and environmentally friendly waste handling and disposal procedures.

Required knowledge includes:

Knowledge of:

- anatomical and physiological terminology used to describe features, actions, location and orientation of the musculoskeletal system
- changes in the anatomical structure that have occurred during the evolution of the horse
- changes in the anatomical structure that can occur due to age, performance, ailments and injury
- conformational characteristics that may impact on musculoskeletal structure stability
- demands on modern competition and working horses that may impact on the musculoskeletal system
- hoof and foot anatomical features and the impact of growth, exercise, ailments and injuries on structures
- pathology and symptomology of common horse ailments and injuries related to the musculoskeletal system of the performance horse
- principles of animal welfare
- relevant legislation, regulations and codes of practice, including OHS, animal welfare and ethics, veterinary practice and waste disposal
- safe work practices
- structure, function, actions, names and location of muscles significant to horse performance
- structure, shape, function, names and location of bones and joints of the horse
- structure, function, name and location of ligaments and tendons significant to horse performance
- workplace hygiene standards (biosecurity) including: disinfectants, cleaning agents and techniques, cleaning and appropriate disinfection or sterilisation of equipment, materials and personal protective equipment (PPE).

Evidence Guide

<p>The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.</p>	
Overview of assessment	
<p>Critical aspects for assessment and evidence required to demonstrate competency in this Unit</p>	<p>The evidence required to demonstrate competence in this unit must be relevant to workplace operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this Unit. Assessors should ensure that candidates can:</p> <ul style="list-style-type: none"> • determine the structural characteristics of equine musculoskeletal system • locate and determine the function of equine muscles and supporting tissues related to locomotion, power and stamina • define the changes in equine musculoskeletal system due to growth, performance, ailment or injury • communicate with others to describe and interpret musculoskeletal structures and features using anatomical, physiological and industry terminology. <p>The skills and knowledge required to relate musculoskeletal structure to horse movement must be transferable to a range of work environments and contexts and include the ability to deal with unplanned events.</p>
Context of and specific resources for assessment	<p>Assessment for this Unit is to be practical in nature and will be most appropriately assessed in an equine workplace or in a situation that reproduces normal work conditions.</p> <p>There must be access to a range of horses and ponies, anatomical models and the relevant equipment and resources to enable one to demonstrate competence.</p>
Method of assessment	<p>To ensure consistency in performance, competency should be demonstrated, to industry standards, on more than two occasions over a period of time in order to cover a variety of circumstances, cases and</p>

	<p>responsibilities and over a number of assessment activities.</p> <p>The assessment strategy must include assessment of competency in a work environment. Suggested strategies for this Unit are:</p> <ul style="list-style-type: none"> • written and oral assessment of candidate's required knowledge • observed, documented and first-hand testimonial evidence of candidate's application of practical tasks • simulation exercises that reproduce normal work conditions • case studies • third-party evidence • workplace documentation. <p>This Unit may be assessed in a holistic way with other Units of Competency relevant to the industry sector, workplace and job role.</p>
Guidance information for assessment	<p>Assessment methods should reflect workplace demands (e.g. literacy and numeracy demands) and the needs of particular target groups (e.g. people with disabilities, Aboriginal and Torres Strait Islander people, women, people with a language background other than English, youth and people from low socio-economic backgrounds).</p>

Range Statement

The range statement relates to the Unit of Competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

<p><i>Operation of the musculoskeletal system</i> may include:</p>	<ul style="list-style-type: none"> • components of the musculoskeletal system: <ul style="list-style-type: none"> • blood supply • bones • cartilage including hoof and foot • ligaments • muscles • tendons • functions of the musculoskeletal system: <ul style="list-style-type: none"> • agonist and antagonist muscle pairs for stability, weight support and range of motion • components of the hematopoietic system • concussion absorption • creation of levers to create power • organ protection • stay apparatus for body stability at rest • storage of energy • storage system for calcium and phosphorus.
<p><i>Structure and type of bones and joints</i> may include:</p>	<ul style="list-style-type: none"> • bone structure: <ul style="list-style-type: none"> • cancellous • concentric lamellae • cortical • marrow • osteons • periosteum • veins • bone types: <ul style="list-style-type: none"> • flat • irregular • long • sesamoid • short • bone functions:

	<ul style="list-style-type: none"> • blood production • mineral storage • structural support • weight bearing • cartilage types: <ul style="list-style-type: none"> • elastic • fibrocartilage • hyaline • cartilage structure: <ul style="list-style-type: none"> • chondroblasts • chondrocytes • structure of joints: <ul style="list-style-type: none"> • cartilaginous joint, joined by cartilage such as sliding, synchondrosis and symphysis joints • fibrous joint, joined by fibrous connective tissue such as a skull suture • synovial joint, not directly joined such as ball and socket and hinge joints • function of joints: <ul style="list-style-type: none"> • amphiarthrosis, permits slight mobility, most are cartilaginous joints eg. vertebrae • diarthrosis, permits a variety of movements, all are synovial joints eg. hip, knee • synarthrosis, permits little or no mobility, most are fibrous joints eg. skull sutures • biomechanical function of joints: <ul style="list-style-type: none"> • simple joint: 2 articulation surfaces eg. hip joint • compound joint: 3 or more articulation surfaces eg. knee • complex joint: 2 or more articulation surfaces and an articular disc or meniscus eg. stifle • surface features and orientation.
<p><i>Structure and types of soft tissues</i> may include:</p>	<ul style="list-style-type: none"> • muscle tissue: <ul style="list-style-type: none"> • skeletal • smooth • cardiac • muscle types: <ul style="list-style-type: none"> • 2/3 headed parallel • quadrate • straight

	<ul style="list-style-type: none"> • triangular • flat • orbicular • pennate • fusiform • ligaments and tendons • surface features and orientation.
<i>Changes to bone</i> may include:	<ul style="list-style-type: none"> • accelerated cell replacement • deformity • demineralisation • growth plate development • ossification • overgrowth.
<i>Changes to soft tissue</i> may include:	<ul style="list-style-type: none"> • atrophy • blood flow increase to muscles • bruising of muscles • hypertrophy • inflammation • lesion development • ossification • temperature increase.
<i>Impact of overtraining and injury</i> may include:	<ul style="list-style-type: none"> • adaptive failure: <ul style="list-style-type: none"> • bleeding • cell wall failure • exertional rhabdomyolysis (tying up) • fractures • inflammation • ligament sprain, tear • ossification of tendons and ligaments • osslet production • swelling • tendon strain or tear • arthritic changes to joint surfaces • joint fluid loss • scar tissue development.
<i>Changes to hooves and feet</i> may include:	<ul style="list-style-type: none"> • abscesses • bruising of soles • concussion related changes: <ul style="list-style-type: none"> • sidebone • navicular disease

	<ul style="list-style-type: none">• corns• cracks and splits in hoof wall• hoof wall separation• wearing of hoof faster than rate of tissue replacement.
<i>Others</i> may include:	<ul style="list-style-type: none">• veterinarians• colleagues• handlers or attendants• equine allied health care providers• owners or carers• trainers.

Unit Sector(s)

Equine