



Australian Government

Department of Education, Employment and Workplace Relations

ACMATE504A Administer anaesthesia and perform surgery on animals for scientific purposes

Release: 1

ACMATE504A Administer anaesthesia and perform surgery on animals for scientific purposes

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the process of preparing personnel, equipment, animals and the facility for anaesthesia and surgical procedures for scientific purposes. Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.
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Application of the Unit

Application of the unit	The unit has been specifically developed for animal technicians working with and caring for animals (all live non-human vertebrates) used within scientific establishments for scientific purposes and teaching. Animal technicians administering anaesthesia and performing basic surgery on animals operate under and must comply with the Australian Code of Practice for the Care and Use of Animals for Scientific Purposes, relevant state/territory legislative requirements as well as protocols, policies and procedures set down by the institution's Animal Ethics Committee (AEC). 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. <i>Note: Scientific purposes refers to 'all those activities that require approval from an Animal Ethics Committee (AEC) and are performed to acquire, develop or demonstrate knowledge of techniques in any scientific discipline, including activities for the purposes of teaching, field trips, environmental studies, research, diagnosis, product testing and the production of biological products'.</i>
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare facilities, equipment and personnel	1.1. Anaesthetic and surgical facilities are prepared for sterile surgery. 1.2. Anaesthetic agents, equipment and supplies are selected and prepared. 1.3. Surgical instruments and equipment are selected and prepared in accordance with surgical procedures. 1.4. Aseptic environment is maintained at all times to ensure sterile surgery. 1.5. Safe work practices, including occupational health and safety (OHS), are followed in accordance with institutional policies and procedures. 1.6. Institutional protocols, policies and procedures as set down by the AEC and relevant legislative requirements are complied with at all times.
2. Prepare animals for anaesthesia and surgery for scientific purposes	2.1. Animals are handled and restrained safely and humanely in preparation for anaesthesia and surgical procedures in accordance with institutional policies and procedures. 2.2. Animals are prepared for anaesthesia and surgery. 2.3. Pre-anaesthetic and pre-operative medication is administered to animals as required.
3. Induce, maintain and monitor anaesthesia in animals	3.1. Pre-anaesthetic and pre-operative evaluations of animals are performed, including indications for the use of tranquillisers, sedatives, analgesics and antibiotics in accordance with institutional policies and procedures. 3.2. Animals are induced in anaesthesia. 3.3. Animals are monitored and maintained during anaesthetic and/or surgical procedures. 3.4. Variations in the physiological parameters and signs of anaesthesia in animals are recorded and interpreted. 3.5. Institutional protocols for anaesthetic procedures on animals and relevant legislative requirements are complied with. 3.6. Anaesthetic emergency procedures are followed in accordance with institutional policies and procedures.
4. Identify and handle a range of body structures, tissues and organs	4.1. Integument and facial structures are located, identified and handled for surgical procedures. 4.2. Musculoskeletal structures are located, identified and handled for surgical procedures. 4.3. Digestive system structures and organs are located, identified and handled for surgical procedures.

ELEMENT	PERFORMANCE CRITERIA
	4.4.Reproductive and organs and structures are located, identified and handled for surgical procedures. 4.5.Other structures and organs relevant to basic animal technology surgical procedures are located, identified and handled for surgical procedures.
5. Perform basic surgery on animals	5.1.Surgical instruments are used correctly and safely. 5.2.Surgical equipment is operated correctly. 5.3.Surgical materials and medications are applied to animals as required and in accordance with AEC approval. 5.4.Basic surgical procedures are performed in accordance with research, institution and AEC protocols and relevant legislative requirements. 5.5.Surgical wounds are sutured as required by surgical procedures. 5.6.Post-operative anaesthesia procedures are completed in accordance with institutional policies.
6. Provide post-anaesthetic and post-operative care for animals	6.1.Analgesics and other supportive therapies are used to manage animals post-anaesthetically and post-operatively. 6.2.Fluid therapy, medication, dressings, bandages and oxygen are applied to animals as required. 6.3.Surgical wounds are monitored for signs of healing, inflammation or infection. 6.4.Animals are monitored post-anaesthetically and post-operatively and abnormalities are responded to appropriately. 6.5.Post-anaesthetic and post-operative emergencies are recognised and responded to immediately. 6.6.Monitoring records are maintained in accordance with research and AEC requirements.
7. Maintain facilities and equipment	7.1.Facilities and equipment are cleaned and stored in accordance with institutional policies and procedures. 7.2.Routine maintenance is carried out on anaesthetic and surgical equipment as required in accordance with manufacturers' requirements 7.3.Anaesthetic and surgical facilities are maintained in accordance with institutional policies and procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- calculate dosage and administer drugs, including anaesthetic and monitor response in accordance with project protocols and workplace standards
- check animals' physical conditions and vital signs and monitor for signs of progress or deterioration in condition or health of animals pre-, during and post-surgery
- comply with animal welfare and ethical standards in the humane handling of animals, administration of treatments, collection of samples and documenting of activities
- identify and locate animal structures, tissues and organs relevant to performance and monitoring of basic surgical procedures and induction of anaesthesia
- maintain the highest standards of hygiene and infection at all times to reduce the risk of infection and cross-infection
- measure, interpret and record animal weight and other relevant data required in the procedures associated with the administration of anaesthesia and related medications
- interpret and apply relevant legislation, regulations, codes of conduct, AEC procedures and standard operating procedures
- prepare and maintain appropriate records, including animal care and ethics register using relevant institutional electronic and/or manual systems
- use chemicals and cleaning agents in accordance with state or territory legislation and organisational policies and procedures
- use equipment and materials correctly and in accordance with manufacturers' specifications
- literacy skills to read, interpret and apply facility policies and procedures, including OHS, infection control, containment and exclusion and waste management; follow sequenced written instructions; record accurately and legibly information collected; and select and apply procedures to a range of defined tasks
- oral communication skills/language to fulfil the job role as specified by the organisation, including questioning, active listening, asking for clarification and consulting with or seeking advice from research group team members, senior or more experienced staff or other relevant persons
- numeracy skills to estimate, calculate and record routine and more complex workplace measures
- 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
- problem-solving skills to use available information and resources and prioritise daily tasks
- use personal protective clothing and equipment correctly

REQUIRED SKILLS AND KNOWLEDGE

- use safe manual handling techniques and/or equipment
- use safe waste handling and disposal procedures
- verify dose rates and identify precautions in application or administration of anaesthetic and other medications.

Required knowledge

- anatomical and physiological terminology, and glossary of terms and nomenclature related to the species being examined
- anatomical structures, tissues and organs relevant to basic surgical procedures and the induction and monitoring of animals under anaesthetic
- aseptic techniques
- biosecurity issues (for animals and humans) relating to conducting surgical procedures
- characteristics of healthy, sick or distressed animals including indicators of normal and undesirable responses to anaesthetic and related medications
- communication procedures and systems, and technology relevant to the organisation and the individual's work responsibilities
- methods and equipment used to monitor animals during anaesthesia and surgical procedures
- information that should be documented regarding the administration of anaesthetic and related substances and application of surgical procedures
- methods used to measure, interpret and record objective measure of animal health
- physiological features of animals related to the application of anaesthesia and related medications and the response to surgical procedures
- principles of animal welfare and ethics
- principles of managing an anaesthetic overdose
- relevant codes of practice, including the Australian Code of Practice for the Care and Use of Animals for Scientific Purposes
- relevant state or territory legislation and regulations relating to the practice of veterinary science, OHS, waste disposal, animal welfare and research
- relevant state or territory legislation covering the use of therapeutic and controlled substances
- surgical procedures and techniques used in animal technology facilities
- safe animal handling techniques, including approved handling methods during the administration of substances and surgical procedures
- terminology used to describe anaesthetic processes, equipment, materials and physiological responses
- types of information that has to be reported and recorded in relation to anaesthesia and surgical procedures
- workplace hygiene standards, disinfectants, cleaning agents, cleaning techniques and cleaning equipment and materials.

Evidence Guide

EVIDENCE GUIDE

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.

Overview of assessment

Critical aspects for assessment and evidence required to demonstrate competency in this unit

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:

- prepare facilities, personnel and equipment, including anaesthetic equipment, anaesthetic agents and surgical instruments and equipment
- prepare animal and carry out pre-anaesthetic and pre-operative evaluation
- comply with institutional protocols, policies and procedures, AEC and relevant legislative requirements
- induce, monitor and maintain an animal in anaesthesia
- perform aseptic and basic surgical procedures
- recognise and respond to emergencies during and after anaesthesia and surgery
- provide post-anaesthetic and post-operative care
- maintain appropriate and accurate records.

The skills and knowledge required to administer anaesthesia and perform surgery on animals for scientific purposes must be transferable to a range of work environments and contexts and include the ability to deal with unplanned events.

Context of and specific resources for assessment

Assessment of this unit is to be practical in nature and will be most appropriately be assessed in an animal research facility or an environment that reproduces normal work conditions that has a scientific establishment licence and access to an approved AEC.

There must also be access to the relevant information, materials and documentation to enable one to demonstrate competence. This would include access to

EVIDENCE GUIDE	
	research animals, anaesthetic equipment, anaesthetic agents, surgical instruments and equipment as required for the anaesthetic and surgical procedures.
Method of assessment	To ensure consistency in one's performance, competency should be demonstrated, to industry defined standards, on more than two occasions over a period of time in order to cover a variety of circumstances and over a number of assessment activities. The assessment strategy must include practical skills assessment. Suggested strategies for this unit are: • written and/or 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 study analysis • third-party evidence • workplace documentation • portfolio. This unit may be assessed in a holistic way with other units of competency relevant to the industry sector, workplace and job role.
Guidance information for assessment	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 socioeconomic backgrounds).

Range Statement

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.

<i>Anaesthesia</i> refers to:	the use of a drug administered for medical or surgical purposes that induces total loss of sensation.
<i>Anaesthetic agents, equipment and supplies</i> may include:	- anaesthesia agents: - isoflurane - ketamine - ketamine combination anaesthesia - methoxyflurane - anaesthetic equipment and supplies: - anaesthetic machines and trolleys - filters - gas cylinders - incubators - masks - re-breathing bags - soda lime and canisters - scavenging systems - tubes - vaporisers - relevant state or territory drugs and poisons legislation must be complied with.
<i>Surgical instruments and equipment</i> may include:	- forceps - needles - needle holders - resection clamps - scalpels - scissors - sutures.
Maintaining an <i>aseptic environment</i> includes:	- positive pressure airflow - sterile drapes, gloves, gowns and equipment - swabs of betadine or alcohol.

RANGE STATEMENT	
<i>OHS</i> risks associated with animal technician procedures include:	• animal bites, kicks, scratches or crush injuries • biological hazardous waste and sharps disposal • handling of chemicals and medicines • gas leakage • inhalation of aerosol particles • intraocular contamination • manual handling, including carrying, lifting and shifting • needle pricks and cuts from other sharps • release of infective agents (animal and human) • scalds and burns from sterilising and cleaning equipment • zoonoses.
<i>Relative legislative requirements</i> include:	• Australian Code of Practice for the Care and Use of Animals for Scientific Purposes • related state or territory legislation for: • animal welfare • protection of cruelty to animals • animal protection • animal research • relevant state or territory drugs and poisons legislation.
Subject to research requirements <i>animals</i> may include:	• on most occasions the animal species will be common laboratory animals: • guinea pigs • mice • rabbits • rats • on some occasions animal species may include: • amphibians, fish and reptiles • dogs and cats • fish • invertebrates • livestock (e.g. sheep, cattle and pigs) • native wildlife (e.g. marsupials and birds) • primates • poultry.
<i>Preparing an animal</i> may include:	• applying restraining devices: • halters or hobbles

RANGE STATEMENT	
	• head collars • muzzles • rearing bits • aseptic preparation of injection sites • clipping • preoperative skin preparation routines • further preparation may extend to: • administration of necessary premedication • intubation and the insertion of intravenous or urinary catheters • preparation of equipment and materials for intravenous infusions.

RANGE STATEMENT	
<i>Pre-anaesthetic and pre-operative medication</i> may include:	- the use of: - analgesics - antibiotics - sedatives - tranquillisers.
<i>Pre-anaesthetic and pre-operative evaluations</i> may include:	- animal health checks: - general health and condition - heart rate - respiration - temperature - weight.
Methods used to <i>induce</i> an animal in anaesthesia may include:	- gaseous and injectable preparations: - intermittent positive pressure ventilation.
Possible <i>anaesthetic emergencies</i> may include:	- an animal going into: - hypothermia or hyperthermia - respiratory distress - shock.
<i>Basic surgical procedures</i> that may be performed on common laboratory animals include:	- embryo insertion - implantation of mini-pumps or catheters - ovarian transfer - vasectomy.
<i>Post-operative anaesthesia procedures</i> may include:	- extubation - continued monitoring of vital signs - positioning of patient recumbency in consideration of recovery phase and surgical site - adjustment of intravenous fluid therapy rates.
<i>Post-operative abnormalities</i> that may be encountered include:	- abnormalities in wounds and surgical sites: - haemorrhage or other exudation - swelling - self-trauma - other abnormalities: - abnormal distension - cold extremities - delayed recovery - increased heart rate - increased respiratory rate

RANGE STATEMENT	
	• low body temperature • pale mucous membranes.

Unit Sector(s)

Unit sector	Animal technology
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Competency field

Competency field	
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Co-requisite units

Co-requisite units		