



Republic of Rwanda
Ministry of Education



MAJOR SURGERY

ANHMS503

ASSIST IN MAJOR SURGERY

Competence

RQF Level: 5

Learning Hours



Credits: 7

Sector: AGRICULTURE AND FOOD PROCESSING

Trade: ANIMAL HEALTH

Module Type: Specific

Curriculum: TVET Certificate V in Animal health

Copyright: © Rwanda TVET Board, 2024

Issue date: August, 2024

2024-25

Purpose statement	This module describes the skills, knowledge and attitude required to assist in Major surgery. It is intended to the learners pursuing TVET Certificate V in Animal health. Upon completion of this module the learner will be able to perform preoperative activities, assist in surgical operations, perform post-operative care activities under minimum supervision.					
Learning assumed to be in place	Ethics and Jurisprudence					
Delivery modality	Training delivery		100%	Assessment		Total 100%
	Theoretical content		30%	Formative assessment	30%	50%
	Practical work:		70%		70%	
	• Group work and presentation	30%				
	• Individual work	40%				
			Summative Assessment		50%	

Elements of Competency and Performance Criteria

Elements of competency	Performance criteria
1. PERFORM PREOPERATIVE ACTIVITIES	1.1. Surgical materials, tools and equipment are properly prepared according to the type of surgery to be performed
	1.2. Workplace is properly prepared according to the type of surgery to be performed
	1.3. Patient is properly prepared according to the type of surgery to be performed
2. ASSIST IN SURGICAL OPERATIONS	2.1. Patient is properly prepared according to the type of surgery to be performed
	2.2. Abdominal surgery is properly performed according to the procedure
	2.3. Orthopaedic surgery is properly assisted according to the procedure
3. PERFORM POST OPERATORY CARE	3.1. Patient after head or neck surgery is properly cared according to the operation performed

ACTIVITIES	3.2. Patient after abdominal surgery is appropriately cared according to the operation performed
	3.3. Patient after orthopaedic surgery is appropriately cared according to the operation performed

Knowledge, Skills, and Attitude

Knowledge	Skills	Attitude
<ul style="list-style-type: none"> ✓ Identification of surgical tools, materials and equipment ✓ Description of basic animal biology and chemistry ✓ Description of animal anatomy and physiology ✓ Description of animal behaviors ✓ Explanation of drugs and drug dosage ✓ Identification of suture materials. ✓ Description of infectious diseases 	<ul style="list-style-type: none"> ✓ Select surgical tools, materials and equipment ✓ Restrain animals ✓ Perform injections ✓ Perform suturing/wound dressing ✓ Perform rehydration ✓ Care operated animal ✓ Apply drug dosage and administration ✓ Prepare patient to be operated ✓ Diagnose and treat animal wound infections and infectious diseases ✓ Assess animal health parameters ✓ Keep record ✓ Report the results 	<ul style="list-style-type: none"> ✓ Being honest ✓ Being polite ✓ Having self-motivated behaviors ✓ Being decisive ✓ Being punctual ✓ Being creative ✓ Being patient ✓ Being responsible ✓ Being flexible

Course content

Learning outcomes	<p>At the end of the module the learner will be able to:</p> <ol style="list-style-type: none"> 1. Perform preoperative activities 2. Assist in surgical operations 3. Perform post operative care activities
Learning outcome 1: Perform preoperative activities	Learning hours: 25

Indicative content


- **Preparation of surgical tools, materials, and equipment**
 - ✓ Head and neck surgery
 - + Preparation of surgical tools and equipments
 - + Preparation of materials (drugs, other consummables)
 - ✓ Abdominal surgery
 - + Preparation of surgical tools and equipments
 - + Preparation of materials (drugs, other consummables)
 - ✓ Orthopaedic surgery
 - + Preparation of surgical tools and equipments
 - + Preparation of materials (drugs, other consummables)
- **Preparation of workplace**
 - ✓ Head and neck surgery workplace
 - ✓ Abdominal surgery workplace
 - ✓ Orthopaedic surgery workplace
- **Preparation of patient**
 - ✓ Head and neck surgery
 - + Restraining technique
 - + Checking of vital signs
 - + Drug administration
 - + Preparation of operation site / asepsis of surgical patient
 - ✓ Abdominal surgery
 - + Restraining technique
 - + Checking of vital signs
 - + Drug administration
 - + Preparation of operation site / asepsis of surgical patient
 - ✓ Orthopaedic surgery
 - + Restraining technique

- + Checking of vital signs
- + Drug administration (antistress, other drugs related to vital signs parameters)
- + Preparation of operation site / asepsis of surgical patient

Resources required for the learning outcome

Equipment	<ul style="list-style-type: none"> ▪ Crush ▪ PPE ▪ Audiovisual equipments
Materials	<ul style="list-style-type: none"> ▪ Cotton ▪ gauze ▪ Needles ▪ Syringes ▪ Bandage materials ▪ Tranquilisers ▪ Anaesthetics ▪ Antiseptics ▪ Antibiotics ▪ Antiinflammatories ▪ Water ▪ Reanimation drugs ▪ Suture materials ▪ Surgical blades ▪ Surgical kit
Tools	<ul style="list-style-type: none"> ▪ Rope ▪ Nose lead ▪ Books and pens ▪ Internet ▪ Animals

Facilitation techniques	<p>Demonstration, group work, Practical works, Group discussion, Brainstorming, Case study, Field visit, simulation.</p> <p>Practical work and/or Field visit</p> <ul style="list-style-type: none"> ▪ Trainer brings trainees to the Clinic to perform preoperative activities on available chosen animal ▪ Trainer gives instructions regarding the task assigned ▪ Trainer monitors group activities ▪ Trainer engages trainees in discussion about effectiveness of the work and provides feedback to close the session
Formative assessment methods /(CAT)	<p>Oral assessment</p> <ul style="list-style-type: none"> ▪ Interviews ▪ Questionnaires <p>Written assessment</p> <ul style="list-style-type: none"> ▪ Matching ▪ True or false ▪ Multiple choice questions ▪ Written report ▪ Sequencing ▪ Essay (short responses / extended responses) <p>Performance assessment</p> <ul style="list-style-type: none"> ▪ Practical task ▪ Demonstration activities ▪ Photographs/drawings interpretation/analysis ▪ Videos interpretation/analysis

Learning outcome 2: Assist in surgical operations	Learning hours: 40
<p style="text-align: center;">Indicative content</p> <ul style="list-style-type: none"> • Assisting in head and neck surgery <ul style="list-style-type: none"> ✓ Oesophageal choke  Description 	

- + Indications
- + Anaesthesia
- + Incision
- + Haemostasis
- + Foreign body removal technique
- + Suturing of the neck

✓ Third eyelid

- + Eyes anatomy
- + Indications
- + Anaesthesia
- + Incisions
- + Haemorrhage control
- + Suturing techniques

✓ Eye enucleation

- + Indications
- + Anaesthesia
- + Incisions
- + Haemorrhage control
- + Suturing techniques

• **Assisting in abdominal surgery**

✓ Treat hernia

- + Description of hernia
- + Types of hernia
- + Anaesthesia
- + Incisions
- + Haemorrhage control
- + Suturing techniques

✓ Prolapsis

- + Description of prolapsis

- + Types of prolapsis
- + Anaesthesia
- + Incisions
- + Haemorrhage control
- + Suturing techniques

✓ Atresia

- + Description of atresia
- + Types of atresia
- + Anaesthesia
- + Incisions
- + Haemorrhage control
- + Suturing techniques

✓ Laparorumenotomy


- + Indications
- + Anaesthesia
- + Incisions
- + Haemorrhage control
- + Suturing techniques

✓ Hysterectomy

- + Indications
- + Anaesthesia
- + Incisions
- + Haemorrhage control
- + Suturing techniques


✓ Ovariectomy

- + Indications
- + Anaesthesia
- + Incisions
- + Haemorrhage control


-  Suturing techniques


- ✓ Foetotomy

-  Indications


-  Anaesthesia


-  Incisions

-  Haemorrhage control


-  Suturing techniques


- ✓ Caesarean section

-  Indications

-  Anaesthesia

-  Incisions


-  Haemorrhage control


-  Suturing techniques

- **Assisting in orthopaedic surgery**

- ✓ Sprain and strain


-  Description 


-  Manage inflammation


-  Immobilization (compress or bandage)

- ✓ Dislocation

-  Description of joint

-  Description of dislocation

-  Restoration of joint


-  Immobilisation technique of joint: Traditional splints, Casts, Bandages

- ✓ Fractures

-  Description

-  Types

-  Reduction

-  Immobilisation technique of broken bones: Traditional splints, Casts, Bandages

Resources required for the learning outcome	
Equipment	<ul style="list-style-type: none"> ▪ Crush ▪ PPE ▪ Audiovisual equipments
Materials	<ul style="list-style-type: none"> ▪ Cotton ▪ gauze ▪ Needles ▪ Syringes ▪ Bandage materials ▪ Tranquilisers ▪ Local anaesthetics ▪ Antiseptics ▪ Antibiotics ▪ Antiinflammatories ▪ Surgical blades ▪ Surgical kit ▪ Suture materials
Tools	<ul style="list-style-type: none"> ▪ Rope ▪ Nose lead ▪ Books and pens ▪ Internet ▪ Animals
Facilitation techniques	<p>Demonstration, group work, Practical works, Group discussion, Brainstorming</p> <p>Demonstration and/or field visit</p> <ul style="list-style-type: none"> ▪ Trainer assembles trainees into the veterinary clinic to demonstrate surgical operation on an animal ▪ Trainer gives instructions including asking clarification if any during demonstration of the operation

	<ul style="list-style-type: none"> ▪ Trainer carries out the surgical operation while explaining to the trainee what going on step by the other ▪ Trainer engages trainees in discussion about effectiveness of the work and provides feedback ▪ Trainer closes the session.
Formative assessment methods /(CAT)	<p>Oral assessment</p> <ul style="list-style-type: none"> ▪ Interviews ▪ Questionnaires <p>Written assessment</p> <ul style="list-style-type: none"> ▪ Matching ▪ True or false ▪ Multiple choice questions ▪ Written report ▪ Sequencing ▪ Essay (short responses /extended responses) <p>Performance assessment</p> <ul style="list-style-type: none"> ▪ Simulation ▪ Observation checklist ▪ Practical task ▪ Demonstration activities ▪ Photographs/drawings interpretation/analysis ▪ Videos interpretation/analysis

Learning outcome 3: Perform post operative care activities	Learning hours: 15
Indicative content	
<ul style="list-style-type: none"> • Care of patient after head or neck surgery <ul style="list-style-type: none"> ✓ Control pain ✓ Control infection ✓ Follow healing and recovery • Care of patient patient after abdominal surgery <ul style="list-style-type: none"> ✓ Control pain ✓ Control infection ✓ Follow healing and recovery 	

- **Care of patient patient after orthopaedic surgery**

- ✓ Control pain
- ✓ Control infection
- ✓ Follow healing and recovery

Resources required for the learning outcome

Equipment	<ul style="list-style-type: none"> ▪ Crush ▪ PPE ▪ Audiovisual equipments
Materials	<ul style="list-style-type: none"> ▪ Cotton ▪ gauze ▪ Needles ▪ Syringes ▪ Bandage materials ▪ Tranquilisers ▪ Local anaesthetics ▪ Atiseptics ▪ Antibiotics ▪ Antiinflammatories ▪ Surgical kit ▪ Suture materials
Tools	<ul style="list-style-type: none"> ▪ Rope ▪ Nose lead ▪ Books and pens ▪ Internet ▪ Animals
Facilitation techniques	Demonstration, group work, Practical works, Group discussion, Brainstorming, Case study, Field visit, Simulation

	Practical work and/or field visit <ul style="list-style-type: none"> ▪ Trainer brings trainees to the farm to follow up an operated animal ▪ Trainer gives instructions of work ▪ Trainer forms small groups of trainees ▪ Trainer assigns tasks to each group ▪ Trainer monitors group activities ▪ Trainer engages trainees in discussion about effectiveness of the work and provides feedback to close the session
Formative assessment methods /(CAT)	<p>Oral assessment</p> <ul style="list-style-type: none"> ▪ Interviews ▪ Questionnaires <p>Written assessment</p> <ul style="list-style-type: none"> ▪ Matching ▪ True or false ▪ Multiple choice questions ▪ Written report ▪ Sequencing ▪ Essay (short responses/ extended responses) <p>Performance assessment</p> <ul style="list-style-type: none"> ▪ Simulation ▪ Observation checklist ▪ Practical task ▪ Demonstration activities ▪ Photographs/drawings interpretation/analysis ▪ Videos interpretation/analysis

Integrated/Summative assessment

Integrated situation

A Farmer of cattle and small ruminants in Kinazi sector, Ruhango District has a cow in his farm with a small ulcer on the eyelid ocular and there is suspicion of squamous cell carcinoma; his goat also presents loose of 25% body weight, bloating and cachexia, while there is no change about feeding and other management practice but few months ago their goats grazed in the pasture behind the shelters. Also his dog which lives

in the farm together with these ruminants fell down and it has signs of fore leg fracture. The District wishes to hire the assistant to the surgeon after passing the practical exam.

As a veterinary technician applied for that position, you are requested to perform the following tasks:

- Perform eye enucleation of the heifer in 1 hour
- Perform Laparo-rumenotomy of the goat in 1 h 30 minutes
- Perform the treatment of the fracture of the dog 1 hour

All the needed resources are available

Resources

Tools	<ul style="list-style-type: none"> ▪ Rope ▪ Nose lead ▪ Books and pens
Equipment	<ul style="list-style-type: none"> ▪ Crush ▪ PPE
Materials/ Consumables	<ul style="list-style-type: none"> ▪ Cotton ▪ gauze ▪ Needles ▪ Syringes ▪ Surgical blades ▪ Bandage materials ▪ Tranquilisers ▪ Anaesthetics ▪ Antiseptics ▪ Antibiotics ▪ Anti-inflammatories ▪ Surgical kit ▪ Suture materials ▪ Animals

Assessable outcomes	Assessment criteria (Based on performance criteria)	Indicator	Observation		Marks allocation
			Yes	No	
	1.1. Surgical materials, tools and equipment are properly prepared according to the type of	Assessment Indicator 1: Surgical tools, materials, and equipment in line with			3

1. Perform preoperative activities	surgery to be performed	eye enucleation head and neck surgery are prepared			
		Assessment Indicator 2: Surgical tools, materials, and equipment in line with laparo-ruminotomy are prepared			3
		Assessment Indicator 3: Surgical tools, materials, and equipment in line with fractures treatment are prepared			4
	1.2. Workplace is properly prepared according to the type of surgery to be performed	Assessment Indicator 1: Workplace aligns with eye enucleation is prepared			4
		Assessment Indicator 2: Workplace aligns with laparo-ruminotomy is prepared			4
		Assessment Indicator 3: Workplace aligns with fractures is prepared			4
	1.3. Patient is properly prepared according to the type of surgery to be performed	Assessment Indicator 1: Patient is prepared for eye enucleation (restraining technique, drugs dosage and administration)			4
		Assessment Indicator 2: Patient is prepared for laparo-ruminotomy (restraining technique,			4

2. Assist in surgical operations		drugs dosage and administration)			
		Assessment Indicator 3: Patient for treatment of fracture (restraining technique, drugs dosage and administration)			4
	2.1. Head and neck surgery is properly performed according to the procedure	Assessment Indicator 1: Sedation and anaesthesia for eye enucleation (dosage and administration) is performed			4
		Assessment Indicator 2: Eye removal (incision, eye extraction and control of hemorrhage) is done			4
		Assessment Indicator 3: Suturing of the eye (suture pattern and technique) is done			4
	2.2. Abdominal surgery is properly performed according to the procedure	Assessment Indicator 1: Sedation and anaesthesia for laparoruminotomy (dosage and administration) is done			4
		Assessment Indicator 2: Foreign body removal in the rumen (incision,			4

		extraction of foreign body and control of hemorrhage) is done			
		Assessment Indicator 3: Suturing (suture pattern and technique) is performed			4
	2.3. Orthopaedic surgery is properly assisted according to the procedure	Assessment Indicator 1: Handling of the dog with leg fracture (manipulation of the dog and the leg presenting the problem) is done			4
		Assessment Indicator 2: Fractures Reduction (restoration of bones in normal position) is done			4
		Assessment Indicator 3: Immobilization technique of broken bone (traditional splints, Casts or Bandages) is performed.			4
	3. Perform post operative care activities	3.1. Patient after head or neck surgery is properly cared according to the operation performed	Assessment Indicator 1: Pain after eye enucleation is controlled		4
			Assessment Indicator 2:		3

		Infection after eye enucleation is controlled			
		Assessment Indicator 2: follow up of healing and recovering after eye enucleation is done			3
	3.2. Patient after abdominal surgery is appropriately cared according to the operation performed	Assessment Indicator 1: Pain after laparo-ruminotomy is controled			3
		Assessment Indicator 2: Infection after laparo-ruminotomy is controled			3
		Assessment Indicator 2: Follow up of healing and recovering after laparo-ruminotomy is done			4
	3.3. Patient after orthopaedic surgery is appropriately cared according to the operation performed	Assessment Indicator 1: Pain after leg fracture is controlled			3
		Assessment Indicator 2: Infection after leg fracture is controlled			3
		Assessment Indicator 2: Follow up of healing and recovering after leg fracture is done			4
Total marks		90			
Percentage Weightage		100%			
Minimum Passing line % (Aggregate):		70%			

References:

1. Anderson, D.E. ed., (March 2001) 'Lameness', Veterinary Clinics of North America: Food Animal Practice, 17, 1, 1–223 (multiple topics)
2. Andrews, A.H. ed., (2000) The Health of Dairy Cattle: Chapter 10 'Internal cattle building design and cow tracks' (J. Hughes); Chapter 11 'Dairy farming systems: husbandry, economics and recording' (D. Esslemont & M.A. Kossaibati), Oxford: Blackwell Scientific.
3. Hyndman B, Ream AK. Selection and maintenance of monitoring equipment. In: Saidman LJ, Smith NT, eds. Monitoring in Anesthesia. 3rd ed. Boston, MA: Butterworth-Heinemann; 1993:505-514.
4. Dorsch JA, Dorsch SE. Understanding Anesthesia Equipment, Construction, Care and Complications. 3rd ed. Baltimore, MD: Williams & Wilkins; 1994:51-147.
5. Eisenkraft JB. The anesthesia machine. In: Ehrenwerth J, Eisenkraft JB, eds. Anesthesia Equipment: Principles and Applications. St. Louis, MO: Mosby; 1993:27-56.
6. American National Standards Institute. ANSI Z79-8: Minimum Performance and Safety requirements for Components and Systems of Continuous Flow Anesthesia Machines for Human Use. New York, NY: ANSI; 1979.
7. American Society for Testing and Materials. ASTM F1161-88 Standard: Specification for Minimum Performance and Safety Requirements for Components and Systems of Anesthesia Gas Machines. West Conshohocken, PA: ASTM; 1997.
8. Narang J, Thys DM. Electrocardiographic monitoring. In: Ehrenwerth J, Eisenkraft JB, eds. Anesthesia Equipment: Principles and Applications. St. Louis, MO: Mosby; 1993:284-296.
9. Perrino AC Jr, Feldman JM, Barash PG. Noninvasive cardiovascular monitoring. In: Saidman LJ, Smith NT, eds. Monitoring in Anesthesia. 3rd ed. Boston, MA: Butterworth-Heinemann; 1993:101-143.
10. A Text-Book of Operative Veterinary Surgery (Classic Reprint), 2016
11. Andrews, A.H. (2000) The Health of Dairy Cattle. Blackwell Science, Oxford.
12. Arthur, G.H., Noakes, D.E., Pearson, H. & Parkinson, T.J. (1996) Veterinary Reproduction and Obstetrics, 7th Edition.
13. Essential of Veterinary Surgery, 8/E, Venugopalan, 2000
14. Veterinary Clinics of North America, Food Animal Practice, Vol. 3.1.W.B. Saunders, Philadelphia.
15. W.B. Saunders, London. Baker, J.C. (1987) Bovine Neurologic Diseases
16. Boothe HW, Skater MR, Hobson HP, et al. Exploratory celiotomy in 200 non traumatized dogs and cats. Vet Surg. 1992; 21(6):452-457.
17. Boothe HW. Exploratory laparotomy in small animals. Compendium Contin Educ Pract Vet. 1990;12: 1057-1066.
18. Savvas I, Papazoglou LG, Kazakos G, et al. Incisional block with bupivacaine for analgesia after celiotomy in dogs. JAAHA. 2008; 44(2):60-66.
19. Mack P, Ooi LL. (1993) *Manual of basic operative laparoscopic and thoracoscopic surgery*. ForcesPublication, Singapore.
20. R.T.H Ng. (1994)*Microsurgery Training & Graded Excercises*. In: Peter Mack (ed): *Clinician's Guide to Experimental Surgery*. Image Medicus, Singapore pp 155-188.