How to Diagnoses and Key steps for Physical, Clinical examination of Diseased animals

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Summary: Finding and treating sick animals early is the key to maintain a safe and nutritious food supply. On dairies it begins with basic history taking and physical examinations of the sick animals. The goal of physical examination includes: to identify sick animals and to treat them early, to prevent the spread of diseases and to improve the animal welfare. Veterinary clinical examination relies on knowledge of Anatomy, Physiology, Pathology and Animal behavior, skills in the methods and techniques of clinical examination, clinical sign and pathogenesis of the diseases which are the basic requirements for clinician in his/her good diagnostic practice. In any clinical examination procedures, it is necessary to employ some suitable means of restraint: physical, chemical or verbal, in order to be able to carry out the examination safely and without danger to the clinician or his assistants. Inspection, Palpation, percussion and auscultation are the commonly used methods of physical examination for assessing pathophysiological or anatomical abnormalities of given animal. In addition to history taking and clinical examination; skills on techniques of laboratory sample collection and submission is an important consideration for further diagnosis and treatment.

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1. Introduction

The purpose of the clinical examination is to identify the clinical abnormalities that are present and the risk factors that determine the occurrence of the disease in the individual or population. From this information the most likely cause can be determined. In addition, the organs or systems involved, the location, type of lesion present, the pathophysiological processes occurring and the severity of the disease can be deduced from the information gained during the clinical examination (Ararsa, 2016).

The success of clinical examination relies heavily on the knowledge of the clinician and usually assumes a single condition is responsible for the abnormalities. Many clinicians begin their examination by performing a general examination which includes a broad search for abnormalities. The system or region involved is identified and is then examined in greater detail using either a complete or a problem oriented examination. For this sound knowledge of Anatomy, Physiology, Pathology and Animal behavior, skills in the methods and techniques of clinical examination, knowledge of etiology, clinical sign and pathogenesis of the diseases are the basic requirements for clinician to make diagnosis.

Physical examination: Allows you to find signs of sickness that are not obvious and helps you to determine the extent of the injury or illness. During a physical examination you look at all the body systems and how they are working, for instance: All body systems are properly in function, if one doesn't work safely it may limit what you can do medically and a veterinarian may pick up on something that the owners didn't see or know was significant (Heart murmur, Growth problem, Skin problem and Parasites).

This review is a practical guideline for veterinary clinician with the following objectives: 1) Guide to apply methods of animal handling/restraint and ability to take history, 2) A guide for general physical, clinical examination for further diagnosis, treatment

and take practicable control and prevention measures on identified disease, 3) Having knowledge on preparation and administration of veterinary drugs.

2. History Taking

In animal disease diagnosis the first thing is taking history of sick animals. Disease problems in veterinary medicine are invariably presented to the clinician through the medium of the owner's complaint, which is a request for professional assistance. For completeness and accuracy of history taking, the following points should be well considered (Patient data, Immediate/present history, past history, Management and Environment history).

Patient data: This data is essential for accurate identification of the patient and includes: a) Owner's name, b) Owner's address: postal address, telephone, kebele, peasant association, c) Species, breed, sex, age, name, ID No., body weight and d) Description including color, marking, polledness, and other identification marks of patient.

Present history: This relates to the sequence of events associated with the period of time that the animal has been ill. Points to be focus in present history are: a) Duration of the disease: whether it is peracute, acute, subacute or chronic, b) Clinical sign/symptoms (appetite for food or drink, defecation, urination, respiration, sweating, physical activity, milk production, growth, gait, posture, voice, odour, etc.), c) The number of animals affected (morbidity rate and mortality rate) and d) Treatment given: determine whether any treatment has, in fact, been given before calling for assistance.

Past history: In this respect, information should be obtained relating to the nature and timing of any previous illness which had affected the individual animal or group. This includes: a) Details regarding clinical features, diagnosis, treatments, morbidity and mortality rates, post mortem observations laboratory test etc., should be obtained, b) Ascertain the system of animal replacement on the farm or in the home c) If animal introduced from outside sources, further enquiries should be made concerning the health history and status of the source animals (Ararsa, 2016).

Management and environmental history: The examination of an animal must be accompanied by a consideration of its surroundings and circumstances. a) **Management** includes: Nutrition, Livestock at pasture, Drinking water, Feeding methods/practice, House space, satisfactory ventilation, Proper management of milking cow and milking machine to avoid udder injury, Breeding and Reproductive history and Stocking rate/population density and b) **Examination of the environment** includes: Topography, Soil type, Ground surfaces, Climatic conditions, Environmental Hygiene, An excessive buildup of feces and urine and Quality of Floor (Ballard and Rockett, 2009).

3. Methods of Restraint:

Since animals often resist many of the clinical examination procedures, it may be necessary to employ some suitable means of restraint, in order to be able to carry out the examination safely and without danger to the clinician or his assistants. The methods available may be classified as: a) **Physical restraint** when various instruments are employed, b) **Chemical restraint** when drugs inducing varying degrees of sedation or immobilization are administered and c) **Verbal/Moral restraining** which can be more practiced by owner.

a) Physical restraint: It is important to perform all the physical manipulations in a quiet and gentle manner in order to carry out the examination safely without causing danger to the clinician or his assistants and to avoid disturbing the patient. Restraining methods for equine, cattle, Pet animal, sheep and goats are explained. Training requirements include: open air clinic, live animals, Rope, nose twitch, bull holder and crash (Ballard and Rockett, 2009).

Procedure includes the following: 1) Restraints of the equine: **a)** Twitch is applied to the upper or lower lip or to the ear**, b)** Nose twitch**, c)** Lifting the fore-leg and hind-leg by unaided hands or with Leg twitch**, c)** A loop of strong cord or soft rope is applied to the appropriate part**, d)** Two ropes one-person horse casting**, e)** Two ropes four persons horse casting. **2) Restraint of the cattle**: **a)** the nasal septum is gripped between the thumb and one finger or with 'bull-holder, **b**) Leg twitches are also employed**, c)** One rope locking two horns on a post or tree**, d)** One rope two person cattle casting **and** two ropes three person cattle casting **3) Restraint of sheep and goat**: **a**) one person holds the neck of the sheep or goat by two hands, **b**) One person stands beside the sheep or goat embracing the animal, **c**)

small animals are restrained by placing them on a table in the upright, lateral or dorsal position **4) Pet animals**: **a)** placing them on a table in the upright, lateral or dorsal position and in the dog a tape muzzle or a leather muzzle is used.

b) Chemical restraint: Drugs that is used for this purpose includes: **a)** Acepromazine, Acetylpromazine, Chlorpromazine, Promazine and Trimeprazine; members of this group can be used in most species of animals.

c) Verbal/moral restraining: It is more practiced by owner e.g., feed provision, massaging, calling name of animal etc.

4. Physical examination methods:

To apply general inspection, palpation, percussion and auscultation methods used to detect clinical signs of abnormalities. Training requirements include: a) live animals (equine, cattle, sheep and goats), Pleximeter, hammer, stethoscope and gloves (Chauhan and Agarwal, 2008).

General inspection: It is done some distance away from the animal; sometimes go round the animal or herd/flock, in order to get the general impression about the case. Attention should be paid to the following items: (Behavior, Appetite, Defecation, Urination, Pasture, Gait, Body condition, Body conformation) and Lesions on outer surface of the body can be observed: (Skin and coat, Nose, Mouth, Eyes, Legs and hoofs, Anus).

Palpation: To detect the presence of pain in a tissue by noting increased sensitivity. **Method**: Use fingers, palm, back of the hand, and fist, in order to get the information about the variation in size, shape, consistency and temperature of body parts and lesions, e.g., the superficial lymph nodes.

Percussion: To obtain information about the condition of the surrounding tissues and, more particularly, the deeper lying parts. Percussion can examine the area of the subcutaneous emphysema, lungs, rumen and rump. Method: By means of striking a part of the body to be percussed.

Immediate percussion: Using fingers or hammer directly strike the parts being examined. **Mediate percussion**: Finger-finger percussion; Pleximeter-hammer percussion. **Modified percussion**: can be Ballottement percussion and Fluid percussion. **Ballottement percussion**: Used to detect late pregnancy in small ruminants, dogs and cats. **Procedure**: Apply a firm and interrupted push on the uterine region of the abdomen of small ruminants. Detection of rebound of floated material shows pregnancy. **Fluid percussion**: Used to detect fluid in the abdomen. **Procedure**: Apply a push on one side of the abdomen, percussion on the other side. The presence of wave-like fluid movement shows accumulation of fluid in the abdomen, e.g., ascites.

Auscultation: To listen the sounds produced by the functional activity of an organ located within a part of the body. This method used to examine the lung, trachea, heart and certain parts of the alimentary tract.

Direct auscultation: **Procedure**: Spread a piece of cloth on the part to be examined using two hands to fix the cloth and keep your ears close to the body, then listen directly.

Indirect auscultation: **Use stethoscope and Procedure**: Fix the probe of the stethoscope firmly on the part of the body to be examined and listen to the sounds produced by the functional activities of the body carefully (Chauhan and Agarwal, 2008).

5. Clinical Examination of the Patient:

This is taking of vital parameters (temperature, hear rate, respiratory rate and capillary refill time), which is critical in animal disease diagnosis.

Temperature taking: Materials requirements are: live animals, thermometer, lubricant (soap or petroleum jelly) and antiseptics.

Procedure: The places, which can be used to take temperature are rectum or vagina (approximately 0.5 degree centigrade higher in vagina), the thermometer should be sterilized by disinfectant (antiseptics) before use, It should be well shaken before recording of temperature to bring the mercury column below the lowest point likely to be observed in different species of animals, The bulb end of the thermometer should be lubricated with liquid paraffin or glycerin or soap especially in case of small pup and kitten, Insert the thermometer in a rotational way and gentle manner, Care should be taken so that the bulb of the thermometer remains in contact with the rectal mucous membrane, The thermometer should be kept in site for at least 3-5 minutes, Pull out the thermometer, clean it and read the number, Evaluation: Read the value to define and explain a

state of fever, hypothermia, and febrile or non-febrile animals.

Pulse taking: Pulse can be adapted from the number of heart beats per minute by using stethoscope in less manageable animals. The rhythm of pulse should also be noticed while taking pulse.

Procedure: Place the digits on the artery to be examined, Applying gentle pressure until the pulse wave can be detected, Note the pressure or pulsation of the arteries felt on the finger digits, Count the number of beats per minute (counting should be done at least for 30 seconds and multiplied by 2); notice the quality and rhythm of pulse (Table 1). Materials requires for pulse taking are live animals, Stethoscope and Watch.

Table 1: Sites of pulse taking for different species of animals.

S No	Species of animal	Site of pulse taking
1	Horse	External maxillary artery, Transverse facial artery, Median artery and Great metatarsal artery
2	Cattle	Facial artery, Median artery and Middle coccygeal artery
3	Sheep/goat, dog, cat, pig, and calf	Femoral artery

Respiration taking: material requirements are: Live animals, Stethoscope, Watch, Gloves and Crash. **Method**: The respiration rate is measured through counting of either contraction or expansion of the thorax and abdomen which can be observed during clinical examination.

Procedure: A method for respiration rate taking includes: ***Inspection***: Stand behind and to one side of the animal, and observe the movement of the thoracic and abdominal areas of the body. ***Palpation***: Put one hand in front of the nostril, feel the exchange of the gas; or put one hand on the lung area or the thorax and feel the respiratory movements. ***Auscultation***: Use stethoscope, listen to the respiration sound in the trachea or lung area.

Capillary Refill Time (CRT): Method: This is taken by compressing the mucosa of the mouth or vulva to expel capillary blood, leaving a pale area, recording how long it takes for the normal pink color to return, in healthy animals the CRT should be less than 2 seconds, a CRT of more than 5 seconds is abnormal, and between 2 and5 seconds may indicate a developing problem (Frandson *et al*., 2009).

Regional anatomy of the heart -locate the heart area: The heart is suspended by great vessels and located on the left median mediastinum of ventral thorax. The left side of the heart apex reaches the chest wall. **For example,** in horse, heart is located between 2nd to 6th intercostal space**,** in cattle, 3rd to 6th **and** in camel, 3rd to 7th. Intercostal spaces found. After the heart, respiratory rates, and temperature are measured, the animal is examined from head to toe. If the animal is severely sick, the veterinarian may take samples of blood, urine, or feces.

Normal range of parameters in animals: in **Cat** (Respiration: 16-40 beats per minute (bpm), Temperature: 101.5°F and Heart Rate (HR): 120-140 bpm), in **Dog** (Respiration: 18-34 bpm, Temperature: 102°F and HR: 70-120 bpm), in **Pig** (Respiration: 32-58 bpm, Temperature: 102.5°F and HR: 70-120 bpm), in **Horse** (Respiration: 10-14 bpm, Temperature: 99-100°F and HR: 28-40 bpm), in **Cow** (Respiration: 26-50 bpm Temperature: 101-101.5°F and HR: 48-84 bpm) and in **Sheep/goat** (Respiration: 16-34 bpm, Temperature: 102.3°F and HR: 70-80 bpm). Below or above of this normal range is something wrong (Frandson *et al*., 2009).

6. Differential diagnosis: This is the ART of differentiation of diseases by comparison and contrasts with similar diseases. For example: differentials of red/coffee colored urine in cattle are cystitis, enzootic hematuria, bovine babesiosis, bovine theileriosis, leptospirosis, pyelonephritis, urinary calculi etc.

7. Tentative diagnosis (presumptive diagnosis): diagnosis based on clinical/physical examinations finding, until precise diagnosis (confirmatory

diagnosis) is made on the basis of laboratory or special investigations (Ararsa, 2016).

8. Treatment: The last thing the veterinarian may do is give the vaccinations, antibiotics based on the laboratory result, diagnosis result and mandatory history.

9. Routes of drug administration

Oral administration: There are large numbers of pharmaceutical preparations available for oral administration. Solid dosage forms (powders, tablet, capsules, pills, etc.) and liquid dosage forms (syrups, emulsion, mixture, drench, electrolytes, etc.)

Parenteral administration (IV, IM, SC, Id, epidural, subconjunctival): It refers to a drug administration by injection directly in to the tissue fluid or blood without having to cross the intestinal mucosa.

Intravenous route (IV) (Given at angle of 25 degree): Gives swift, effective and highly predictable blood concentration and allows rapid modification of dose and is used for emergency treatment. In most animals (horse, cattle, sheep and goat) usually given through jugular vein and in pig-ear veins, in the dog and cat-cephalic vein and recurrent tarsal vein (Kahn, 2010).

Intramuscular (IM) route (Given at angle of 90 degree): Absorption occurs either hematogenous or via lymphatic and is usually fairly rapid except for long acting preparation.

Subcutaneous (SC) route (Given at angle of 45 degree): Preferred when slow and continuous absorption of drug is required. The injected drug disperses through the loose connective tissues. They dissolve in tissue fluid before it can enter either capillaries or lymphatic (Kahn, 2010).

Intradermal route (ID) (**Given at angle of 10-15 degree)**: Used for testing hypersensitivity test and for vaccination (Kahn, 2010).

Epidural route: Refers to deposition of drug up on or outside the Dura matter. E.g. Introduction of local anesthetics between the first and second coccygeal vertebra to eliminate straining.

Drug dose calculation: Dose is the quantity of the drug to be administered at one time and expressed in mg/kg or IU/kg. *Dose* = (*Body weight x Dose Rate)/ Concentration.* E.g., A 5 kg cat needs an antibiotic at a dose of 15 mg/kg. The antibiotic comes in liquid form at concentration of 25 mg/ml how many ml do you give? Solution: (5 kg x 15 mg/kg)/25 mg/ml=3ml.

10. Prognosis

Prognosis is forecast or foretelling the probable course or termination of the disease. It may be graded as good/favorable, doubtful, poor/grave. Prognosis always performs after diagnosis (Kahn, 2010).

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