7- Traumatic perforation of the abdominal wall from exterior by horn gores, trocarization, during laparafomy (sepsis); intraperitoneal injections may cause peritonitis.

8- Rupture of spleen, liver or umbilical vessels.

9- Tuberculosis and actinomycosis cause localized infections, ganders, pyaemia ... etc.

10- In the course of some specific diseases as in serositis and arthritis (in sheep & goats) bovine encephalomyelitis (in cattle).

Pathogenesis:

Four factors operate:

a) Toxemia or septicemia.

b) Paralytic ileus.

c) Accumulation of fluids exudate.

d) The development of adhesions.

E) Bacteria and toxins produced from breakdown of tissues absorbed through the peritoneum causing toxemia.

Clinical signs:

A- Variations between bacteria and their virulence and toxin production, the type of infection govern the condition.

a) In acute diffuse peritonitis = toxemia is profound.

b) Local inflammation signs are negligible.
B- Paralytic ileus results from the reflex inhibition of alimentary tract tone and the movement in acute peritonitis.

C- Accumulation of fluids causes abdominal distension leading to interference with resorption.

D- In chronic peritonitis the formation of adhesion is more important and the signs are not clear, but vigorous exercise breakdown the adhesions with return of clear clinical signs.

**Clinical findings:**

A- Acute diffuse peritonitis:

1- Severe abdominal pain where the animal refuses any abdominal palpation.

The animal arches its back and its trunk is rigid. The animal generally lacks desire to move and if it does, it will be as on pieces with grunting at each step. Also it does not lie down and if it lies it will be with great care.

2- Highly elevated body temperature.

3- Increased respiration that may be mainly thoracic type.

4- Increased pulse rate.

5- Affected animals is reluctant to pass urine and faeces and when urination occurs there is usually very large amount of urine.

6- Vomition especially in pigs (in early stages).

7- In rare cases when the exudate is sufficient in amount it will cause abdominal distension.
8- Constipation is usually present.

9- The outcome in cases of acute diffuse peritonitis varies with the severity. Peracute cases accompanied by severe toxemia usually die within 24 hours.

Less severe cases are fatal in 4-7 days but adequate treatment may result in recovery in about the same length.

B)- Acute local peritonitis:

As in acute diffuse form but the signs are less severe and temperature and pulse are moderately elevated and the outcome is more likely to be favorable.

C) Chronic peritonitis

- There will be a picture of in digestion and toxemia.

1- By rectal palpation one can feel adhesion of the intestinal mass and may also found distended or ballooned parts of the intestine as a result of constriction or even obstruction in the intestine resulting from adhesion and constriction of fibrous tissue formation around the intestine.

2- The condition of the animal may be very bad and even death may occurs from the increased adhesions.

Clinical pathology:

- There is leucopema in peracute cases.

- Leucocytosis with shift to left and neutrophilia in acute diffuse peritonitis.

- Bacteriological examination of fluid removed by paracentesis.
**Diagnosis:**

Mainly from the clinical findings but is somewhat difficult in cases accompanied by marked toxemia and in severe chronic cases.

**Treatment:**

1- Avoid giving food for the 1St 48 hrs and give only saline and glucose solution by I/V injection. In addition give polyvitamines and amino acids.

2- Give sedative (Novalgin by I.V. injection) to control the pain, every 12 hrs.

3- Gives broad-spectrum antibiotics by I.M. injection.

4- Apply hot application on the abdomen.

5- Supply the animal with plenty soft feedings.

6- Surgical drainage of the abdominal cavity is advisable to remove the source of toxins and make relief for the animal.

**SKIN DISEASES**

The skin is a heterogeneous organ, which serves as the principal medium of communication between the animal and its environment. The main functions of the skin include maintenance of water and electrolyte balance of the body, participation in temperature regulation, mechanical protection and limitation of penetration of noxious physical and chemical agents, sensory perceptively and elaboration of vitamin D.

The skin is a stratified tissue consisting of two major layers: the outer epithelial layer called epidermis and the inner corium or dermis. The associated structures, including hairs, quills, horns, claws, nails, hoofs and sebaceous and sweat glands, all develop from the epidermis. Smooth muscle fibers comprising the erectors poilorm, which are attached to the hair follicles, are distributed at intervals throughout the dermis.’
The epidermis, which extends over the whole surface of the body in mammals is composed of two main layers: the stratum Malpighii and stratum corium. The deeper stratum Malpighii is subdivided into a basal layer stratum germinativum, one cell thick overlying the dermis, and the stratum spinosum (prickle cell layer) of varying thickness. The upper prickle cells comprise the stratum granulosum, superimposed on which is a hyaline layer, the stratum lucidum, seen only on the digital pads and muzzle of the dog, cat and other animal. The outer stratum corium is composed of dead keratinized cells which are continuously shed from the skin surface.

The dermis consists of a fibrous connective tissues layer, the bulk of which comprises collagen along with elastic and reticular fibbers. Capillary loops and nerve endings. Cutaneous appendages including hairs and sebaceous and sweat glands extend from the epidermis into and even beyond the dermis itself.

As well as being directly involved in a variety of disease processes, the skin and coat are indirectly influenced by the general health status of animal.

The incidence of skin disease in domestic animals is high. It may be primary or secondary in origin. In primary skin diseases, the lesions are restricted to the skin and its associated structures, spread to other tissues may occur as a complication. Secondary skin disease occurs as the result of extension of a disease process from elsewhere in the body.

Skin diseases may also be classified into parasitic and non-parasitic categories, according to their etiology. Skin parasites in animals include certain members of the dermatophytes and metazoan groups, many of which will be referred to later in this section. It is important to remember that some skin diseases are contagious, so that prompt recognition is essential in order to prevent further dissemination of infection and to assist control. In this contest there are several parasitic skin diseases, including sheep
scab and parasitic mange in equine species, which are subject to statutory control in many countries.

The risk to persons handling animals affected with certain parasitic skin diseases is an important public health responsibility for the veterinary clinician. Sarcoptic mange and certain forms of ringworm are a problem in this respect. Temporary personal embarrassment can arise from acquisition, through contact with animals, of certain of the larger arthropod parasites such as ticks and fleas.

**Clinical examination:**

In the general examination of the patient, visual inspection would reveal when obvious skin disease was present. At all events the history of the case, as noticed by the owner or attendant, would in many instances, have drawn attention to the situation of the trouble. In such circumstances, the general clinical examination would be followed by a special examination of the skin, consisting of more detailed inspection and also palpation, coupled with other procedures, such as the taking of skin scrapings for examination for parasites, skin swabs for bacteriological examination and skin biopsy for histological examination in selected areas.

In the text, which follows the various skins, structures will be considered in sequence, and changes from normal structure or function, along with any other associated clinical sign, will be discussed. Reference will also be made to the application of any of the special methods of examination where they are considered to be appropriate.

**Condition of the coat:**

In any persistent disturbance of nutrition, the coat is affected and becomes lusterless, dry and staring; conversely, a smooth, shiny coat usually implies that the animal is not suffering from significant nutritional deficiency. In the examination of the coat it is
necessary to take into consideration the species, breed, grooming and housing of the animal. In healthy cattle, during winter tick marks can be seen over the body. Certain breed of animals are naturally rough coat and shaggy, e.g. Scottish highland cattle, old English sheep, dog, horses and cattle that are allowed to run at grass for a long period. Particularly during the winter, grow a rough coat of long hair, lack of grooming leads, to a dirty rough, lusterless coat. In such neglected animals, long hair may become matted into locks or balls, the hair is greasy in seborrhoeic eczema.

Contraction of the erectors pilorum muscles is a nervous reaction occurring in emotional states associated with the release of adrenaline (excitement, fear, anger). It is also present during the shivering (rigor) stage of fever, i.e. when there is a feeling of coldness in spite of a normal or even an elevated body or skin temperature, sometimes even accompanied by sweating. Erection of hair occurs locally over areas of serous infiltration into the skin, e.g. in Urticaria.

In the spring and autumn it is normal, in most species for the coat to be changed (molting). Occasionally at molting the hair, for some unknown reason, may be shed so suddenly and rapidly that the whole body of the animal is denuded. Loss of hair occurs mainly in demonstrable diseases of the skin itself, such as eczema, dermatitis, mange, and ringworm and in generalized disease, which also involve the skin, such as iodine deficiency and hyperkeratosis, when it is known as asymptomatic hair loss. Sometimes, however, the skin itself shown no structural lesions, in which case the condition is known as alopecia, it is due to follicle dysfunction, the cause of which is sometimes difficult to ascertain. It may occur in certain forms of poisoning (mercury, selenium, thallium, potato poisoning in the horse); in copper deficiency; in hormonal imbalance as hypothyroidism.

Changes in pigmentation of the coat include a decrease or an increase. Decreased pigmentation causing graying of the hair occurs physiologically in old age, particularly
on the head of the horse, dog and ox. Sometimes, it occurs prematurely in the young animal. When it is usually difficult or impossible to identify the cause. Harness marks are composed of white hairs or hairs with an alternately white and pigmented shafts. The position of these depigmented arrows indicate that they are due to the effects of pressure caused by various kinds of harness, bandages, etc.

Reduced pig, mention of the coat occurs in certain chronic debilitating diseases (John’s disease, molybdenosis, hypocuprosis). An increase in pigmentation is usually a very local event and occurs following irritation of rather short duration.

**Elasticity of the skin:**

The elasticity of the skin is tested by lifting up and then releasing, a fold of skin in the region of the neck, back or ribs. In a healthy animal, the fold of skin is easily grasped at these sites and release immediately flattens out again. This test particularly well demonstrated in the dog, in which species have -a proportionately large fold of skin may- be raised readily from the region of the back.

When its elasticity is reduced. The skin is less easily picked up and the fold tend to remain after the grip has been released. When the elasticity of the skin is completely lacking it is impossible to pick up even a small fold. The animal is then said to be hidebound. Loss of elasticity arises when there is reduction in the semifluid ground substances of the dermis and subcutaneous tissues, as well as of the elastic fibbers. The elasticity of the skin is reduced when itself is affected with disease, particularly in those diseases which are extensive and of long standing (eczema, mange) and in various systemic disorders associated with marked loss of condition (malnutrition, tuberculosis, leptospirosis, etc.) and/or severe dehydration (salmonellosis, white scour, enteric colibacillosis of pigs, transmissible gastroenteritis of pigs, vomiting and wasting disease of suckling pigs, John’s disease, subacute grass sickness, diabetes insipidus).
Surface of the skin: -

Changes in the colour and/ or structure of the skin not only occur in primary diseases of the integument. But may also be secondary to many systemic diseases, e.g. a vesicular and pustular exanthema may occur vesicular and pustular exanthema may occur in canine distemper, an Urticaria eruption in association with feeding high protein diets and in swine erysipelas.

Absence of pigment may occur in a general or local form and is inherited or acquired. Albinism (White skin) is a developmental or hereditary absence of melanin in the skin, it is seen as a breed characteristic, particularly in rabbits. Vitiligo means an induced deficiency of pigment, e.g. white patches permanently affecting a pigmented skin, it is sometimes seen as a sequel to disease of the skin, e.g. ringworm and gladness.

Excessive pigmentation causing the affected part to become much darker or even black, occurs in places where irritation has been intense.

Increased redness or hyperemia of the skin may be circumscribed or diffuse, it occurs in inflammatory diseases of the skin (acute dermatitis), and underlying structures in photosensitivity reactions, and also as a result of extreme dilatation of the cutaneous capillaries in certain systemic diseases of the pig, e.g. Swine erysipelas, swine fever, salmonellosis and pasteurellosis, and in sun burn and heat stroke.

Cutaneous hemorrhage is caused by rupture or increased permeability of the walls of the dermal and subcutaneous blood vessels (warfarin and sweet clover poisoning).

Bluish discoloration of the skin, or cyanosis, occurs when the capillaries, contain venous blood, it disappears ‘if the blood is squeezed out from an area of skin. It occurs to a variable degree, in a generalized form, in all diseases associated with respiratory distress
(chronic pulmonary congestion, pneumonia, respiratory paralysis, airway obstruction, hydrothorax and pneumothorax).

Yellow discoloration of the skin (Jaundice or icterus), which can only be identified in non-, pigmented areas, occurs when an excessive quantity of free bile pigment or conjugated bilirubin passes into the blood and deposited in the tissues.

**PRURITIS (ITCHNESS):**

This is a characteristic sensation having much in common with pain, but it create the desire to scratch, which pain does not.

Itchness is associated with a variety of skin diseases in animals, and is indicated subclinically by scratching, biting and rubbing against any convenient object. The stimulus for itching may originate peripherally or centrally.

Itching of central origin occurs and Aujeszky’s disease (pseudorabies), in certain forms of hepatitis, obstructive jaundice, chronic nephritis, diabetes mellitus and the nervous form of Acetonaemia. Apparent itchiness, indicated by licking and biting one of the extremities, is a feature associated with other neurological signs, in occasional cases of canine distemper.

Local histamine release, as in Urticaria, is a known chemical mediator of itching. It is doubtful whether memodermia or “skin memory” a well known form of pruritis in man, in which skin hypersensitivity evinced by scratching persists after relatively mild lesions have disappeared, occurs in animals.

**Primary lesions:**

A macula or spot is a circumscribed area of discoloration of the skin, which is not elevated above the level of the surrounding skin, e.g. the local hyperemia of the skin, which occurs at the onset of many skin diseases including the pox group. Lesions of this
type arising from erythema of the skin can be temporary obliterated by pressure, in contrast to those due to hemorrhage into the skin caused by the bite of a tick or louse. Macula may be large or small, circular or irregular.

A papule or a pimple is a solid elevation on the surface of the skin, varying in size from a pinhead to a pea, caused by cellular infiltration. A similar lesion of larger size is described as a nodule and still larger lesion of this type is termed a node. The situation of a papule in an area of skin covered by hair can be recognized by the erection of the overlying hair on the coat, in the form of a tuft. Papules may involve only the superficial layers of the epidermis, in which cases they are comparatively avascular and painless, or they may extend more deeply which they become vascular and painful.

Eruptions of a papular or nodular character occur in the early stages of acne, furunculosis, eczema, various forms of animal pox, contagious pustular dermatitis (Orf) of sheep, in lumpy skin disease and malignant catarrhal fever of cattle and in ganders in horses.

A vesicle is a small elevation of the superficial epithelium of the skin caused by a lenticular shaped accumulation of serous fluid or lymph between the epidermal (prickle cell) or dermal layers.

A pustules is a similar lesion containing pus, which gives its yellow colour. Vesicles containing blood are black in colour.

A wheal is a circumscribed swelling in the skin caused by local serous infiltration and erythema, as in Urticaria. The lesion has a flat surface and in unpigmented skin it is beetroot colored. The number, size and shape are variable.

Secondary lesions:
Scurf (Scales or Pityriasis) is discarded epithelial tissue retained in the coat. A certain amount of desquamation is normal consequence of the continual proliferation of the germinative layer of the skin. Pityriasis is exaggerated in certain dietary, parasitic or fungal diseases, and in some forms of chemical intoxication. The Important dietary deficiencies include Avitaminosis A, nicotinic acid, riboflavin and linolenic acid.

Erosion is a destructive loss of the superficial layers of the skin (epidermis). Erosive lesions, which tend to develop other characteristics, occur in the interdigital cleft and on the teats as well as the more usual sites in cattle in foot and mouth disease and vesicular stomatitis, and the muzzle in malignant catarrhal fever and mucosal disease.

An ulcer is the result of localized destruction breakdown of tissue, which may occur as part of an inflammatory reaction or may result from trauma. Ulceration of the skin occurs at the site of earlier vesicular or necrotic lesions in foot and mouth disease, vesicular exanthema, bovine ulcerative mammilitis, malignant catarrhal fever, Rinderpest, mucosal disease, lumpy skin disease, ulcerative dermatitis and certain diseases of equidae which will be refer to almost immediately.

A crustor scab is a firm mass, consisting of dried inflammatory exudate and epithelial debris or f blood, in which case it is black, and closely attached to the underlying tissues. Scab formation is a recognized phase in the animal pox diseases and in many other conditions in which a cutaneous exanthema or ulcer occurs at an earlier stage. Characteristic crusts occur in ringworm in cattle and in certain instances also in rabbits, dogs and cats.

A scar is formed by the proliferation of fibrous tissue at the site of a lesion which has destroyed the corium of the skin. Causes include disease associated with severe, extensive or deep ulceration or trauma which may have been self infected, of surgical origin or result from injudicious use of irritant drugs or catheterization.
Eczema:

Eczema has been defined as inflammatory reaction of the epidermis to exogenous or endogenous substances, which may act in the manner or sensitizing agents. In many instances, predisposing factors such as nutritional deficiency, trauma, certain chemicals or ectoparasites may play a significant part in its development.

In typical cases the skin reaction, which shows a tendency to extend to the dermal layers is characterized by a variety of lesions including any combination of papules, vesicles and pustules, with a varying degree of cutaneous erythema, which results in moist, crusted or scaly itching lesions.

True eczema is rare in large animals. Occasionally it is seen in the horse, but the other farm animals are only rarely affected.

DERMATITIS

The term dermatitis includes those conditions characterized by inflammation of the deeper layers of the skin, including the blood vessels and lymphatics, with secondary involvement of the epidermis. The cause of dermatitis in animals may be classified as follow: bacterial, Mycotic dermatitis of cattle and sheep. Infectious dermatitis of pigs, ulcerative Granulomatous of pigs. Viral (Cow pox, Pseudo cow pox, swine pox, horse pox, sheep pox, bovine ulcerative mammilitis, contagious pustular dermatitis of sheep, lumpy skin disease of cattle, ulcerative dermatosis of sheep); Fungal (ringworm, initially in all species, only involve the stratum corneum, but in some cases more especially in horse, may spread to the dermal layers, sporotriehosis in horses; metazoan ectoparasites (mange and other mites, myiasis caused by blowflies or screw worm fly larvae, stephanofilariasis, cutaneous habronemiasis); physical agents (sunburn, frost-bite, photosensitization, fleece rot in sheep due to excessive wettings, radiation burn); irritant or toxic chemicals (mercuric iodide, to the skin, or arsenic taken orally), nutritional
deficiency of the nicotinic acid or biotin in the diet is considered to produce dermatitis in pigs or undetermined (excessive consumption of potato in cattle, collie nose in dogs). Allergy to certain substance which are innocuous to most animals more usually results in the development of eczema involving the epidermis alone; when the reaction is severe, the deeper tissue are likely to be affected as in allergic dermatitis in horses.

The inflammatory reaction associated with dermatitis varies in intensity depending to some degree on the character of the causal agent and whether self inflicted trauma has taken place. It may be acute or chronic, supportive, exudative, seborthoeic, ulcerative or necrotic. Erythema is observed in unpigmented skin and pain or itching is evident. The temperature of the affected area is raised and cellular and fluid infiltration produce thickening of the skin. The main histological changes in acute dermatitis consist of leukocyte infiltration and cellular necrosis.

Its clinical features readily recognize dermatitis; its specific nature may be indicated by the characteristic syndrome some of the etiological agent produce. Differentiation from eczema is sometimes difficult unless contact with a known allergen can be established. Examination of skin scrapings or swabs for parasites, bacteria or fungi is always advisable. Skin biopsy is also worth serious consideration as it provides the opportunity to examine the deeper structures of the skin in a variety of ways. Some of the types of dermatitis referred to will be considered on more detail later in this chapter.

**HYPERKERATOSIS**

Hyperkeratosis (thickening of the skin with or without loss of hair) is produced by accumulation of excessively keratinized epithelial cells on the surface of the skin. Although thickening of the skin may occur in any part of the body in all species, hyperkeratosis is recognized most often as a clinical entity in cattle (particularly calves), in which it is caused by contact with or ingestion of certain chemical substances, such as highly chlorinated naphthalene compounds, which are incorporated in wood
preservatives, lubricating oils and insulating materials and creosote, arsenic, etc. In chlorinated naphthalene and creosote poisoning, the excessive keratinization is due to interference with conversion of carotene to vitamin A by the liver hyperkeratosis is not a feature of nutritional Hypovitaminosis A) and with normal cell division in the granular layer of the epidermis, leading to hypertrophy of the stratum corneum and adhesion of epithelial scales. The skin of the upper two thirds of the stratum corneum and adhesion of epithelial scales. The skin of the upper two thirds of the trunk and the sides of the neck is thickened and wrinkled and that over the angle of the jaw and upper part of the neck is characteristically dry, gray, wrinkled and hairless (there are also papillary proliferations of the mucous membrane of the mouth, tongue, esophagus and other parts of the alimentary tract. In newborn animals especially calves, rare cases of congenital hyperkeratosis (ichthyosis, fish scale disease) may occur.

**PARAKERATOSIS**

This is a condition of the skin in which keratinization of the superficial epidermal cells is incomplete. The initial abnormality consists of edema of the prickle cell layer with lymphatic dilatation and leukocyte infiltration. These lesions may be extensive and diffuse or localized.

Parakeratosis also occur in a diffuse form in calves being reared on ‘whole milk, or processed milk diets, when these are deficient in zinc (less than 40 ppm). Areas of affected skin include legs, scrotum, neck and head especially around the nostrils. The calves’ loss condition and fail to thrive unless additional zinc is provided. In sheep, loss of wool with thickening and wrinkling of the skin in the exposed areas characterize parakeratosis.

In a local form parakeratosis is often confined to the flexor aspects of joints where it results from non-specific chronic inflammations. Clinical examples include mallenders and sallenders. Parakeratosis occurs along with other skin changes including superficial
desquamations and alopecia, in thallium poisoning. Noting that skins crusts in the former are soft, and when removed leave a raw surface beneath makes differentiation of parakeratosis from hyperkeratosis.

ECTOPARASITES

A number of important ectoparasites are responsible for producing skin disease in animals. The larger species include ticks, kids, fleas and lice which are readily seen and recognized as such with naked eye the sheep ked (Melóphagus ovinus) is a blood sucker, and heavy infestations may cause anemia; otherwise it is a source of irritation resulting in scratching, biting and damage to the fleece; staining of the wool may depreciate the value of the fleece. Kids are suspected to be a vector of a fever in sheep Goats are also sometimes infested by kids.

Like the sheep ked, lice are usually host specific and pass their whole life on the host. There are a considerable number of species of lice but only two types are recognized:
a) Biting lice, which have broad, blunt beads with chewing, mouth parts.
b) Sucking lice with long, narrow heads and mouthparts designed for sucking blood.

Ticks are of great important as vectors in the transmission of many diseases in animals. In addition they may have more direct effects on animal health, e.g. Ixodes recinus and Argus spp. as well as some other are active blood- suckers that in heavy infestations they are capable of causing very severe anemia. Otherwise tick borne infestation may interfere with food intake and cause loss of weight and depressed production.

In addition to their direct effect on animals ticks may transmit a variety of Protozoal, bacterial, viral and rickettsial diseases.

Mange mites:
Certain species of the mange mites (Psoroptes, Chorioptes and Otodectes) are visible to the unaided eye, but require the use of a microscope for their identification. Many of the other mange mites (Sarcoptic and Notoecires) however, can be found and identified only by Microscopical examination of suitable material.

Suitable material for this type of examination is obtained from the periphery of the active skin lesions. Scales are scrapped off with a sharp bladed knife held at a wide angle to the skin surface until slight bleeding occurs (when working out of doors, the examiner may find it helpful to rub a little 5% caustic potash solution, or water, onto the selected area by means of a cotton wool swab, so that the skin scrapings adhere to the knife blade instead of being blown away by the wind). Some of the material is then placed on the microscope slide, triturated with a few drops of a 5 - 10% solution of potassium hydroxide (and may be gently heated to near boiling point over a small flame) until the crusts and scales are softened and somewhat clarified. The preparation on the slide is gently pressed out into an even layer with a cover slip or another slide, taking care to exclude air bubbles. Alternatively, the scraping from the skin may be gently boiled in the potash solution in a suitable test tube, using a water bath. When the liquid becomes syrupy, centrifuge and after discarding the supernatant fluid, place the deposit on a microscopic slide and examine the preparation with minimum delay. Preliminary examination is carried out under low power magnification (about 100 diameters); for species identification, the detailed morphology of the mites is obtained with medium magnification (about 300 diameters).

For a diagnosis of mange, recognition of mites, portion of mites or eggs is sufficient, but a negative finding may not mean that mange is absent. Further material from the same and different lesions on the skin must be examined.

Sarcoptic mange affects many species including man. It is caused by Sarcoptic scabii, which is usually considered to have individual host subspecies. For example, S. scabii
var. bovis, etc., this host specificity is by no means absolute, so that interspecies transmission can occur fairly readily. In the early stage of development the lesions are characterized by the appearance of small red papules and general hyperemia of the affected area, with excoriation by biting and scratching because of the intense itchiness. Later because of exudation, dry scales and crusts form which, when the disease is severe, become extensive and may be up to 1 cm thick. In the horse and ox, the head and neck are chiefly affected. The medial surface of the thighs and around the root of the tail is also likely to be involved in cattle. In the pigs the lesions appear on the inner aspect of the pinna of the ear and spread to limbs and trunk; in the sheep, goats and rabbits the head and ear are first affected then spread to involve the whole trunk except in the sheep, where the lesion don’t occur in the woolen area. In the dog the areas involved include the face behind the muzzle, posterior border of the ear, elbow, sternal region, base of the tail and posterior aspect of the thigh.

Psoropitc mange is of greatest importance in the sheep, in which species it is known as “scab” but it occurs in all species of animals. The causal parasites, Psoropitc communis, is much more host specific than S. scabii, so that biological evidence suggested that each species of animals is affected by a distinct species of Psoropitc mites, viz, horse, P. communis equi and P. hippotis; ox, P. communis bovis and P. communis natalensis; sheep, P. communis ovis; and goat, P. communis caprae.

Demodectic mange occurs in all species of domestic animals. The incidence is highest in the dogs, although it may be sever in the goat and in some areas large proportions of cattle may be affected. The causal mites, which differ from other mange mites by invading hair follicles and sebaceous glands, are host specific, being thereby designated as Demodex bovis for cattle. D. equi for horses, D. ovis for sheep, D. caprae for goats, D. phylloides for pigs and D. canis for dogs.
It occurs in two main types: a squamous (scaly) form usually found in the region of the head and neck (very often around the eyes) and a pustular (follicular) form resulting from secondary staphylococcal infection, which may affect almost any part of the body surface. The squamous form is most commonly seen in the dog, and is relatively uncommon in large animals. The pustular form occurs in the dogs, occasionally in the ox, pig and goat, and very occasionally in the horses. A third type occurs in the dogs, which in the initial stages stimulate acute eczema and may be of the nature of an allergic type of reaction.

Material suitable for laboratory examination in suspected cases of demodectic mange consists, in the squamous form, of a fairly deep scarping taken with sharp blade from the most severely affected part of the skin and in the pustular form of the squeezed out content of a pustule.

**Ringworm:**

Ringworm is a disease caused by Dermatophytes fungi which invade the superficial layers of the skin or its appendage, the hairs and nails. Although ringworm affect animals in all countries, the incidence is highest when animals are kept in close contact, such as occurs when they are confined in houses or yards. The disease is most prevalent during the winter months and affected animals tend to recover spontaneously during spring. A number of species of two genera of fungi are recognized to cause ringworm in domestic animals. According to the specific character of the affection it can be classified as:

a) Trichophytosis, which occurs in all species, the commonest form of ringworm being associated with Trichophton varcosum var discoids infections in the calf

b) Microsporosis, which occurs in the horse, pig and small animals mainly in the form of Microsporum canis infections in the dogs and cats.
Ringworm is an important zoonotic disease, it has been determined that in rural area about 80% of human ringworm is acquired from animals. It can be diagnosed by skin scraping; some of the collected materials is placed on microscope slide with a few drops of 10% pot. Hydroxide solution, it cover slip is applied and the slide gently wormed if present in any quantities, will be more readily detectable under high power magnification in the form of chains (Trichophton) or and irregular mosaic (Microsporum) of highly retractile arthrospors, which may form a sheath sometimes of considerable thickness around the shaft of an affected hair, mycelia may be seen in the interior of the hair.

When repeated Microscopical examination of selected material from suspected ringworm lesions fails to reveal the presence of the causal fungus, specimen material may be submitted to a laboratory for a cultural examinations.

Bacterial infections of the skin: -

The skin may be invaded by bacteria, giving rise to a variety of diseases including impetigo, acne like conditions, furunculosis, cutaneous pyodemia, and the various forms of bacterial dermatitis mentioned earlier. A variety of bacteria including streptococci, staphylococci. (Sycosis), diphtheroid species, Dermatophilus spp. and other associated with these conditions. Please see a textbook of internal veterinary medicine.

Myiasis: -

The important Myiasis affecting are screwworm infestation and blowfly strike. In the former conditions the female flies, Callitroga Americana and Chrysomia bezziana laid
their eggs in fresh surgical and other rooms (the navel of newborn animals is a common site).

Affected sheep are restless, move around with the head lowered, wriggle the tail and tend to bite and kick at the infested areas, which is moist and brownish in colour. The larvae move to the periphery of the area. Blowfly Myiasis is readily recognized but specific identification of the flies involved necessitates examination of larvae and fly trapping. Nematodes Certain species of nematodes are recognized causes of skin diseases in animals in some countries. Stephanofilariasis stilesi, a filarial worm, produces lesions clinically similar to those of Sarcoptic mange on the ventral aspect of the body or on the midline in cattle. The scab-covered lesions vary from 2 to 15 cm in diameter. The causal parasite, both in the adult and larval forms can be found in scrapings made from active parts of the lesions. Other stephanofilariasis spp. Causing dermatitis include: S. dedoesi which causes dermatitis (cascado) in cattle in the East Indian; S. kaeli and S. assamensis which cause (humpsore) in cattle in India and Malaya; and S. zaheeri, which causes (erasure) of buffaloes in the same countries.

Infestation of the skin wound in horses by the larvae of Habronemus muscae, H. microstoma, or H. megastoma causes cutaneous habronemiasis.

When the larvae are deposited in wounds they cause an inflammatory reaction with the production of quantities of granulation tissue (summer sores, Swamp cancer) the lesions occur on the face below the eye and on the midline of abdomen, areas where the vector flies are not readily distributed. Larvae may only be found following biopsy, in the central part of early lesions, in later lesions, a marked local esenophilia is characteristic.

**Photosensitization:**

Secondary dermatitis following damage of the superficial layers of relatively unpigmented skin by the energy released from interaction between light of certain wave
lengths and certain photodynamic agents, occurs in the disease phenomenon known as photosensitization. Photodynamic agents may be ingested in an active form. A variety of plants and some chemical substances have been especially incriminated as important sources of these so-called Hepatogenous photosensitization.

The lesions are confined to those unpigmented parts of the body most exposed to sunlight, so that they are usually most obvious on the dorsal aspects with diminishing intensity down the side and are virtually absent from the ventral aspect. The initial sign is erythema followed by edema, both stages being associated with severe irritation, which causes the animal to rub the affected parts, therapy producing lacerations. Exudation causes matting of the hair, and edema may cause dropping of the ears, dysphagia because of swelling of the lips and dyspnoea due to nasal obstruction.

Diagnosis depends upon appreciation of the distribution and nature of the lesions. Recognition of the type of food sensitization requires consideration of other aspects.

**CUTENEous ODEMA (ANATHARCA)**

This is swelling on the surface of the body caused by increased diffusion of serous fluid into the tissue spaces of the subcutis and secondarily of the dermis. It is recognized by the appearance of doughy swelling that pit under pressure, when pressed firmly with the finger tips it retains the indentation for a considerable periods of time.

Edema of the cutaneous tissue is caused either by increased hydrostatic pressure in the capillaries or by reduced osmotic pressure of the blood, inflammatory damage to capillaries walls and obstruction of lymphatic drainage. Classified according to the origin as following:

1- Non inflammatory edema:

The signs of inflammation are missing so that there is neither redness nor pain and the affected areas are cool (cold edema).
It occurs:

a) As a sequel to increase hydrostatic pressure in the veins and capillaries arising from congestive heart failure, traumatic pericarditis in cattle, fibrosis of the liver and in compression of veins by tumors (obstructive odema).

b) As a sequel to a fall in plasma protein concentration (hypoproteinaemia).

2. Inflammatory odema:

This is associated with inflammation resulting in damage of small blood vessels by toxins or infectious agents e.g. Abscesses, anthrax, blackquarter (Clostridium chauvoei), malignant odema (Clostridium septicum, Cl. chauvoei, Cl. perfringens, Cl. . sordellii, Cl. odematiens) septicemia pasteurellosis of cattle (Pasteurella multocida type 1), bowel odema (E. Coli)

**GENERAL SYSTEMIC STATE**

Many infectious and non-infectious diseases exert their effect through disturbances of homeostasis (relative constant of the internal environment of the body). The following items are considered as the most important effects of diseases and play a major role in its pathogenesis, clinical signs and prognosis.

1. Toxaemia.

2. Disturbances in internal body temperature such as hyperthermia, hypothermia and fever.


5. Disturbances of body fluids, electrolytes and acid-base balance.

**1. TOXAEMIA**
It is the condition caused by the presence of circulating toxins produced by bacterial or body cells. It does not involve the diseases caused by toxic substances deriving from:

- Plants.
- Insects.
- Ingested organic or inorganic poisons.

**Causes:**

Antigenic and metabolic toxins:

A- Antigenic toxins (Produced by bacteria and to some extent by helminthes parasites), they are classified into exotoxins and endotoxins.

1- Exotoxins

They are very specific proteinous toxins, which diffuse to the surrounding medium, such as toxins produced by clostridium species and Staphylococcus. Those exert their effect mainly on the intestinal mucosa causing disturbances in fluid and electrolyte balance or called enterotoxins.

2- Endotoxins:

They are lipopolysaccharides and found within the cell, usually as a part of cell wall, they are liberated into the medium when the bacterial wall is broken down. They are similar in their pathological effect to exotoxins. They are not usually absorbed through the intestinal mucosa unless it is damaged or strangulated causing systemic intoxication, they are largely absorbed also from mastitic udder, peritonitis, metritis, abscesses and other septic foci, E coli, salmonella spp. and Corynebacterium spp. are the best examples of endotoxins secreting bacteria.

**B- Metabolic toxins:**
These are toxins, which may be accumulating as a result of incomplete elimination of toxic materials produced by normal or abnormal metabolism. Examples of metabolic toxins are:

- Toxic phenols, cresols and amines, which accumulate and are absorbed in the obstructed lower intestine causing autointoxication.

- Histamine and histamine like substances are examples of toxins produced by abnormal metabolism.

- Ketone bodies in association with primary and secondary Acetonaemia.

**Pathogenesis and clinical signs:**

The specific effect of bacterial endotoxins and metabolic toxins are variable according to the type and amount of toxins present in the animal body.

Endotoxins such as that of E. coli are potent pyrogen and cause severe shock resulted in tissue perfusion, disseminated intravascular coagulation, Haemoconcentration, neutropenia and finally subsequent neutrophilia and thrombocytopenia are the common reaction. Hepatic dysfunction, hypoglycemia and abortion are also characteristic for E.coli endotoxins.

**Systemic effect:**

- Systemic effect of endotoxins, endotoxaemia (endotoxicosis) plus to that caused by inflammatory stress of the disease could be summarized into the following effects:

**1- effect on carbohydrate metabolism:**

- Hypoglycemia.

- Decreased glucose tolerance of tissues.

- Disappearance of hepatic glycogen.

- Increased blood lactate and pyruvate due to poor tissue perfusion and anaerobic nature of tissues metabolism resulting into mental depression and poor prognosis.
2- Effect on protein metabolism:
• Increase tissue breakdown and increase in blood non-protein nitrogen.
• Increase in total blood serum protein due to stimulation of antibody production.

3- Mineral metabolism:
• Decrease blood serum iron and zinc levels.
• Increase blood serum copper due to increase blood serum ceruloplasmin.

4- Effects on tissues and body systems:
• Stimulation of phagocytic cells by the infections agent which leads to liberation of substances that affect endocrine glands and enzymes systems of the liver, Damage of the liver and kidney parenchyma may also occur.
• Reduction in the functional activity of most tissue and organs due to combined effects of hypoglycemia, high blood lactate and low blood pH.

Diagnosis:
It is usually difficult to diagnose toxaemia due to the difficulties in isolation of toxins, however it could be recognized on the basis of the described clinical syndrome, clinical pathology and the accompanying signs if primary disease.

Treatment:
- Removal of the cause of toxemia if possible.
- Provision of specific antitoxins.
- Supportive therapy such as fluid and electrolyte infusion.

2- DISTURBANCES IN INTERNAL BODY TEMPERATURE
A. HYPERTERMIA (HEAT STROKE)
It is an elevation of the body temperature due to excessive heat production or
absorption, or to deficient heat loss when the cause of these abnormalities are purely physical.

**Causes:**

1- Mainly higher environmental temperature and prolonged severe muscular exertion especially when the humidity is high and the animals are fat with a heavy hair coat, or are confined with inadequate ventilation such as on board ship. The critical point of environmental at which heat stroke occurs is variable according to animal spp., breed, age and its healthy condition.

2- Other causes include:

- Neurogenic due to damage of hypothalamus e.g. spontaneous hemorrhage.
- Dehydration.
- Excessive muscular activities in strychnine poisoning.

**Pathogenesis:**

- Advantageous effects of hyperthermia:
  1- Inhibition of growth and multiplication of the invading organism.
  2- Facilitate the processes of phagocytosis and immune body production.

- Pathological effects of hyperthermia:
  3- Increase metabolic rate up to 40-50% resulting in depletion of liver glycogen.
  4- Considerable loss of weight and lack of muscle strength accompanied by hypoglycemia and rise in blood nonprotein nitrogens.

**Clinical findings:**

- Increase in internal body temperature above 39.5 °C (in most cases exceeds 42.0 °C).
- Increase in heart rate with weak pulse and increased respiratory rate.
- Sweating and salivation occur firstly followed by dryness of mouth and skin.
- Restless, then dullness and affinity to lie down.

- Increase thirst.
- Finally, when temperature exceeds 41°C in most species there is labored respiration, general stress, then collapse, convulsion and coma may occur.
**Diagnosis:**
- Case history of grazing on a pasture in hot climate or severe muscular exertion may be helpful in recognition of hyperthermia.
- Heat stroke or hyperthermia could be distinguished from fever and Septicaemia by the presence of signs of toxaemia in the latter conditions. Petichael hemorrhage is present in septicemia.
- In fever the temperature seldom exceed 41 °C but in hyperthermia it frequently does.

**Treatment:**
1. Cold application.
2. I.V. injection of fluids such as normal saline and dextrose 5%.
3. Avoid the long standing of animals on hot climate.
4. Adequate supply of drinking water is essential.

**B. HYPOTHERMIA**

It occurs when excess heat is lost or insufficient heat is produced so that the body temperature falls below the normal range.

**Causes:**
1. Exposure to severe cold air
2. Decrease in muscle tone as parturient paresis
3. Acute Ruminal impaction.
4. During anesthesia and sedation.
5. It associates profuse diarrhoea.
6. It associates peripheral vasodilatation in shocks.
7. In terminal stages of many diseases where reduction in the metabolic activity occurs.

N.B Sudden fall in body temperature of a previously febrile animal is a bad prognostic sign and is called premortal falling.

**C. Fever**

It is a syndrome in which hyperthermia and toxaemia are produced by substances circulating in the blood stream.
Causes:
I. Septic fever:
In infection with bacteria, viruses, protozoa and fungi.

1. Aseptic fever:
   • Chemicals e.g. injection of foreign protein.
   • Surgical fever due to tissue breakdown.
   • Fever from tissue necrosis.
   • Immune reactions, anaphylaxis and angioneurotic edema.

Pathogenesis:
   • Most fevers are mediated through the action of endogenous or leucocytic pyrogens (interleukin-l) produced by gametocytes, monocyte and macrophages. The mediators between endogenous pyrogen and the hypothalamus appear to be prostaglandin’s and the level of calcium in the hypothalamus appears to regulate its activity.
   • The effects of bacterial and tissue pyrogens are exert their effects on the thermoregulatory center of the hypothalamus resulting in:
     a) Stage of increment or chill is manifested by cutaneous vasoconstriction resulting in coldness and dryness of the skin, absence of sweating, muscular shivering, minimal urine formation and rectal temperature is increased.
     b) Stage of constant temperature or fastigium (high point of fever) in which heat dissipation and production return to normal. Cutaneous vasodilatation causing flushing of the skin mucosa, sweating and diuresis.
     c) Stage of decrement or fever effervescences, It occurs when the effect of pyrogens is removed. It is manifested by continuous heat dissipation until the rectal temperature return to normal or subnormal state.

3. SEPTICAEMIA/VIRAEMIA
It is a diseased condition in which there are toxaemia., hyperthermia and the presence of
large numbers of circulating infectious agents e.g. viruses, bacteria and protozoa. The difference between Septicaemia and bacteraemia is that in bacteraemia, Bacteria are present in the blood stream for only transitory periods and do not produce clinical signs. In Septicaemia, bacteria are present in blood stream during the course of disease, multiply and produce toxins which responsible for clinical signs e.g. Anthrax, pasteurellosis, salmonellosis, Rift valley fever.... etc.

**Pathogenesis:**
- A profound toxaemia due to exotoxins and high fever. Localization of organism and toxins in many organs causing severe hazard in animals, which survive the toxaemia. Damage to the endothelium and hemorrhage into tissue commonly result. In viraemia it is the same pathogenesis except that viruses do not produce toxins. The products of tissue cells killed by the multiplying viruses are responsible for the clinical signs. Disseminated intravascular coagulation may occur in septicaemic diseases. This begins with a vascular injury and disrupted entima as a result of circulating foreign bodies, bacterial cell walls, antigen-antibody complexes and endotoxins.

**Clinical findings:**
Signs are those of toxaemia and hyperthermia. It includes fever, submucosal and subepidermal hemorrhage.

**Diagnosis:**
Depend upon:
1. Clinical signs.
2. Isolation of the causative agent.

**Treatment:**
1. Urgent intravenous or parenteral administration of antibiotic and antitoxin.
2. Antipyretic and supportive treatment should be done.

4. PAIN
Pain is a distressing sensation arising from stimulation of specific end organs in particular parts of the body and perceived in the thalamus and cerebral cortex. It is a protective mechanism by which the animal express about the presence of exogenous or endogenous harmful influences. The pain is measured by observation of actions and behavior of animals and by measuring of its physiological parameters.

**Causes:**
- Cutaneous or superficial pain e.g. burning, freezing, cutting and crushing, demiatitis, laminitis, mastitis, foot rot, trauma etc.
- Visceral pain e.g. inflammation of serous surface of many organ such as pleurisy, peritonitis, pericarditis, nephritis, distention of visceral organs such as stomach, bladder, swelling of organs and obstruction or twisting of organs………..etc.
- Musculoskeletal or somatic pain e.g. muscle haematoma, myositis, fracture, arthritis, dislocations of joints, sprains of ligaments and tendons……………………etc.

**Pathogenesis and clinical findings:**
- The physiological responses to pain include morphine-like endorphin release from the brain giving an endogenous analgesic system and cortisol released by adrenal cortex. It is manifested by tachycardia; polypnoea, pupilary dilatation, hyperthermia and sweating.
- The behavioral response include abnormal posture, gait, rolling, pawing or crouching, flank watching... ……..etc.

**Elicitation of pain by the veterinarian:**
It is an essential part of clinical examination and include:
- Pressure by palpation such as firm ballottement with the first and use of a pole to depress the back a horse. Movement by having the animal walk actively or by flexing or extending limbs or neck.
- Stimulation of pain; e.g. stimulation of coughing.
5. DISTURBANCES IN BODY FLUIDS
ELECTROLYTES AND ACID-BASE BALANCE

This item could be referred in the part of Clinical laboratory diagnosis

DRUG INTERACTION (DI)

The effect of DI may be:

1. Increase the effect of used drugs.
2. Decrease the effect of used drugs.
3. Harmful especially toxic effect.

Types of the used effect of drugs or substances:

(I) Those & affecting gastrointestinal tract.

1. Antacids: These clearly minimize the absorption of certain antibiotic like penicillin and tetracycline.
2. Antidiarrhoeal drugs: Like pectin, bithmus, and kaolin.
3. Substance that lower the absorption of certain antibiotics as milk and its byproduct which absorption of calcium complex and tetracycline.

(II) Those causing interaction at the receptor site:

1. Neuromuscular blocking affects certain antibiotics as neomycin, streptomycin, bacitracin, gentamycin, and kanamycin.

These effect is exaggerated by giving muscle relaxant as anesthetics or drugs like barbiturate or sodium citrate or giving organophosphorus insecticides leading to respiratory depression or apnea or even muscle weakness.

•2. Increasing the catabolic effect of glucocorticoids

3. May cause decrease in the production of antibodies as using antibiotics mainly broad spectrum ones for a long periods.

(III) Activity against pathogens:

1. Giving bacteriostatic drugs with certain bactericidal effect where the effect will be on those bacteria that did not multiply quickly.

2. Decreasing the inflammatory response of certain drugs as giving corticosteroids,
bacteriostatic antibiotics will minimize the power of phagocytosis of white blood
phagocytic cells against bacteria.

(IV) Those causing toxic effect due to interaction:
Many of antibiotic when given together at one time cause toxic effect which may be severe leading to renal failure or even death of the animals.

(V) Interaction which changes acid-base balance: As alkalosis or acidosis will affects the spreading of certain in the animal body or even affecting these actions on the microorganism.

Concerning the effect of antibiotics:

(I) Human health concern:
1- The pressure of certain residue of antibiotics in the meat or the milk or their product of animals which are used for human consumption especially in people that have certain sensitivity from the used antibiotics.
2- Occurrence of bacterial resistance against the used antibiotics which eventually leads to ineffective treatment of human being against these bacteria.
3- Certain antibiotics from the given animal product to human being may cause unwanted harmful effect as carcinogenic effect.

(II) Animal health concern:
1 Harmful effect on the rumen microflora.
2. Sensitivity harmful effect on the animal itself.
3. Toxic effect from the improper used of antibiotics.

(III) Producer concern:
By the low the presence of residue of certain antibiotics in the meat or any other animal product need total condemnation of these products which lead to great losses from the economic point of view for the producers.

Species difference as a consideration in drug therapy:
These depend on the fate of the drugs in the animal body and its effect. This difference is dependent on:
1. Absorption of the drugs.
2. Distribution of the drugs in the body.
4. The effect of the drug on the microbes, which differs from one animal to another.

**Precaution in giving antibiotics orally:**
1. When the aim is the treatment of internal organ other than gut, the antibiotic must be water-soluble and vise versa.
2. Avoid giving certain drugs, which interfere with the absorption of antibiotics as atropine.
3. Do not use the antibiotic that had its expired date.
4. The used antibiotics must be known its effect on bacteria present in the animal.
5. The difference in the effect of antibiotic on the microorganisms, which differ from one animal to another, must be taken in consideration.
6. The process of the excretion of the antibiotics from the animal or bird body must be taken in consideration, consequently long acting antibiotics must not be given to birds as its capacity to get rid of the these antibiotics is very weak, consequently the presence of these antibiotics in the bird body will be harmful.
7. Do not give sedative like salicylates to carnivorous as these animals mainly cats cannot get rid of these drugs except after a long period which will cause harmful effect on them (in cats it will be in their bodies for 38 hours while in sheep only 8 hours).

**Drug metabolizing enzymes:**
Generally most of the given drugs are rapidly metabolized in rodents than in farm animals or man. Consequently carried out experimental work of certain drugs. On rodent must not be taken as a measure for human, this is because certain enzymes as glycogenic transferase is deficient in man while it is abundant in rodents. These enzymes are responsible for getting rid of the used drugs.

**Variation in animals responsible systems:**
This depends on:
1. Physiological response.
2. Biochemical reaction in the animal body.
3. Integrative effect in the animal body.

For example, atropine dilates the pupil of an animal but does not dilate those of a bird as the muscles of the pupil in the birds are striated while in animals they are smooth.

**Clinical significance of used drugs:**

(1) Pallor drugs: Which are drugs that can be removed from the animal body by renal excretion and not by metabolism through their liver.

(2) Drug related to glucoronic system: where their excretion from the animal body needs the presence of glucoronic transferase enzyme.

(3) Drugs that lose their action in acidic or alkaline media or acid media to exert their effect.

**Antibiotic prophylaxis in veterinary practice:**

This is used for:

1. Protection against certain disease(s).
2. Protection against the sensitivity of certain microbes against certain antibiotics.
3. For minimizing the effect of certain chronic affection.
4. For animal in critical care conditions.
5. To know the effect of certain antibiotics.

**The bad and opposing effect of antibiotics:**

1. Toxic effect.
2. Development of resistant of certain microorganisms against the used antibiotics when it is improperly used.
3. Colonization and super infection effect.
4. These occur when the given antibiotic will destroy certain bacteria giving super infection with severe effect on the animal which usually are manifested in the high increase in the total WBCs count and occurrence of fever.
Conditions that don’t giving antibiotics:
1- Clean surgery.
2- Viral infection.
3- Immunosuppressed patients.
4- When cortisone’s are given.
5- Tumors affections especially leukemia.

VETERINARY EMERGENCY AND CRITICAL CARE FACILITY
Intensive care emergency facilities and the practical of critical care medicine must be available in veterinary private clinic as well as in governmental ones.
This is because of:
1- Increased public awareness of the necessity and availability of critical care emergency for saving the life of the variable diseased animals.
2- From economic point of view, to save the critical life threatening conditions.
3- Providing good medical service for critically ill animals especially those after major surgical operation.

Types of animals admitted to the critical emergency facility care:
1. Animals require intensive nursing care.
2. Animals that are physiologically stable but require intensive monitoring or observation.
3. Animals that are physiologically unstable and require constant veterinary care.

Drugs and compounds should be available in critical care facility:
1. Blood.
2. Glucose for intravenous injection.
4. Lactate ringer.
5. Potassium chloride.
7. Sodium bicarbonate.
8- Sterile water for injection.
9- Aminophyllin.
10- Antibiotics.
11 - Antihistaminic.
12- Ascorbic acid
13- Assorted eye and ear medicament.
14- Atropine.
15- Calcium gluconate.
16- Calcium chloride.
17- Digoxin (Injectable oral).
18- Antiinflammatory drugs (Steroidal and nonsteroidal ones).
19- Anticoagulant drugs.

**Personal character:**
1. They must have the ability to work under stress.
2. They must have the ability to maintain in good communication skills with other members of the team in this stressful environment.
3. They must follow continue reduction and training course about the work in intensive care unit (ICU).

**Laboratory and diagnostic capabilities:**

**I. Hematology equipments:**
1. Instruments for blood sampling.
2. Chemicals for carrying out of blood tests.
3. Apparatuses for carrying out of blood tests with accurate determinations.

**II. Cytology equipments:**
1. A slide preparation tissue for direct smear tissue *examination or aspiration* or biopsy samples.
2. Needed stains as Gram stain or other quick needed stains.

**III. Microbiology equipments:**
1. Aerobic and anaerobic media for bacterial cultivation.
2. Different instruments needed for microbiological sampling and examinations.

IV. Ancillary services equipments
1. Radiography services.
2. Ultrasonography service.
3. Endoscopy and bronchoscope services.
5. Respiratory function equipment

The emergency and critical cares patients:
1. Animals with serious traumatic injuries especially those with major or internal hemorrhages or with deep coma or those with cardiopulmonary or kidney failure. In addition to those with severe traumatic shocks.
2. Surgical emergencies:
3. Gastric dilatation.
4. Intestinal obstructions.
5. Thoracopulmonary intervertebral disc.
7. Fracture (severe pain).
3. Preoperative and postoperative surgical patients especially in the major operations.
4. Patients with acute abdominal pain.
5. Patients with severe shock including sepsis nurses and septic shocks.
6. Physical and chemical injuries.
   a) Heat stroke.
   b) Hypothermia.
   c) Burns.
   d) Erospite (freezing effect on a part of the body or on the body as a whole).
   • Cardiac emergency patients especially those suffering from failure.
• Patients with metabolic and endocrine emergencies.
  a) Diabetic and ketoacidosis diseases.
  b) Acute adrenocortical insufficiency (Addison disease).
  c) Hypothyroid mexodemal comatic patients.
  d) Feline thyrotoxicosis.
  e) Pituitary and nephrogenic diabetes insipidus.
  f) Hypercalcaemia (more than 15-20 mg/dl).
  g) Hypocalcaemia.

Ocular emergency patients (eye affections mainly severe ones that need periodical
treatment and nursing along the whole day).

10. Neurological emergency patients:
  1. Spinal and traumatic affections.
  2. Brain traumatic injuries.

Seizures patients (those with repeated motor seizures
without intervening periods of consciousness).

11- Urological emergency patients:
  1. Upper urinary tract traumatic affections.
  2. Renal trauma.
  3. Lower urinary trauma mainly those of urinary
bladder.
  4. Urethral prolepses.
  5. Urethral obstruction.
  6. Acute renal failure.

12- gastrointestinal emergency patients:
  1- penetrating wounds on laceration of the esophagus.
  2- Caustic or other chemical gastrointestinal injuries.
  3- Gastric foreign bodies.
  4- Acute diarrhoea.
5- Intestinal obstruction.
6-Non traumatic affections of the large intestine.
7-Acute bacterial enteritis.
8-Acute parasitic enteritis.
9-Acute pancreatitis.
10-Hepatic failure.
11- Hematological and ontological emergency patient.
12-Anaemia.
13-Bleeding disorders.
14-Leukaemia.
15-Oncologic metabolic emergency patient (especially those related to tumor affections).
16-Oncologic myelosupression especially those induced by chemotherapy.
1. Skin anaphylaxis affections (arthropod bite or stings).
2. Biotraumatic dermatitis.
3. Skin diseases with threatening complications (severe mite infestations in dogs.
4. Severe erythema.
5. Skin malignant tumor.
6. Life threatening disorders with skin diseases, these are like:
7. Dermatomycosis.
8. Endocrine disorders.
10. Autoimmune diseases.
11. Drug eruption effect.
12. Respiratory emergencies:

a- Upper airway emergencies affections(nose, upper esophagus, trachea and larynx).
b- Chest emergencies affections: Mainly those the lung and pleura.
13. Reproductive tract emergency patients:
  a) Dystockia.
  b) Postpartum emergency mainly eclampsia (calcium deficiency) and cystic endometrial hyperplasia in case of pyometra.
  c) Acute bacterial prostitis.
  d) Prosthetic abscess.
  e) Paraphymosis.
  f) Orchitis especially acute form.
  g) Inguinal hernia.
  h) Testicular torsion (dog with intra abdominal testis).

17. Toxicological emergency patients:
Those suffering from toxins affections especially severe acute form.