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Guide to occupational health and general dog care

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Foreword

International standards for humanitarian mine clearance programmes were first proposed by working groups at an international technical conference in Denmark, in July 1996. Criteria were prescribed for all aspects of mine clearance, standards were recommended and a new universal definition of 'clearance' was agreed. In late 1996, the principles proposed in Denmark were developed by a UN-led working group and the International Standards for Humanitarian Mine Clearance Operations were developed. A first edition was issued by the UN Mine Action Service (UNMAS) in March 1997.

The scope of these original standards has since been expanded to include the other components of mine action, and to reflect changes to operational procedures, practices and norms. The standards were re-developed and renamed as *International Mine Action Standards* (IMAS).

The United Nations has a general responsibility for enabling and encouraging the effective management of mine action programmes, including the development and maintenance of standards. UNMAS, therefore, is the office within the United Nations responsible for the development and maintenance of IMAS. IMAS are produced with the assistance of the Geneva International Centre for Humanitarian Demining.

The work of preparing, reviewing and revising IMAS is conducted by technical committees, with the support of international, governmental and non-governmental organisations. The latest version of each standard, together with information on the work of the technical committees, can be found at <http://www.mineactionstandards.org/>. Individual IMAS are reviewed at least every three years to reflect developing mine action norms and practices and to incorporate changes to international regulations and requirements.

Introduction

The more obvious challenges faced when using dogs for detection of mines are issues such as training methodology, environmental factors, and operational procedures. Occupational health and general dog care may be given less attention, despite the obvious need to ensure good dog health and welfare. When a demining organisation decides to establish a Mine Detection Dog (MDD) capacity, they have already made a commitment to invest significant funds and resources in the dogs themselves. Like other demining assets, dogs need to be well looked after. Lack of attention to care of dogs will result in a reduced output and cost efficiency, and will raise questions about the credibility and reliability of MDD as a whole.

Dogs need to be well fed and well treated in order to perform successfully. A well-balanced diet increases resistance to disease. It also makes the dog stronger, increases its perseverance and interest during training and operations. Reduced performance of a dog reduces safety and cost effectiveness. Mine detection is hard physical work. MDD can be compared with human athletes, where training and diet, mental health, fitness, and preventive treatment against potential diseases and injuries are all vital for success.

IMAS 09.44 is a guide to occupational health and general dog care. It addresses all the basic health and dog-care requirements applicable to MDD worldwide. However, IMAS 09.44 is not a substitute for national standards or Standard Operational Procedures (SOPs). MDD are used under many different environmental conditions. It will therefore be necessary to adapt the principles of IMAS 09.44 to the local operational conditions, and it is the responsibility of national authorities and demining organisations using MDD to incorporate these principles into their national standards and SOPs.

Guide to occupational health and general dog care

1. Scope

This standard provides guidelines for occupational health and general dog care. It covers general health care and health control, medical support requirements, dietary requirements, kennel requirements, transportation of dogs and details of epidemic diseases and dog parasites.

2. Terms, definitions and abbreviations

A complete glossary of all the terms, definitions and abbreviations used in the IMAS series of standards is given in IMAS 04.10.

In the IMAS series of standards, the words 'shall', 'should' and 'may' are used to indicate the intended degree of compliance. This use is consistent with the language used in ISO standards and guidelines:

- a) 'shall' is used to indicate requirements, methods or specifications which are to be applied in order to conform to the standard;
- b) 'should' is used to indicate the preferred requirements, methods or specifications; and
- c) 'may' is used to indicate a possible method or course of action.

The term 'National Mine Action Authority (NMAA)' refers to the government entity, often an inter-ministerial committee, in a mine-affected country charged with the responsibility for the regulation, management and coordination of mine action.

Note: In the absence of a NMAA, it may be necessary and appropriate for the UN, or some other recognised international body, to assume some or all of the responsibilities, and fulfil some or all the functions, of a MAC or, less frequently, an NMAA..

The term 'MDD organisation' in this IMAS refers to any organisation (government, NGO or commercial entity) responsible for implementing demining projects or tasks with the use of MDD. The MDD organisation may be a prime contractor, subcontractor, consultant or agent.

The term 'demining' refers to activities which lead to the removal of mines and ERW, including unexploded sub-munitions hazards.

The term 'Mine Detection Dog' (MDD) refers to a dog specifically trained to detect the vapour from mines and ERW, which may be not only explosive vapours but vapour from the case material and other substances. MDD training and deployment are often significantly different from those given to other search dogs.

'Epidemic diseases' are diseases, which spread rapidly and extensively by infection and affect many individuals in an area or a population at the same time. In contrast to an endemic disease, which is prevalent in or peculiar to a particular locality, region, or people.

In this Standard, the term 'nutrition' describes the process by which a dog assimilates food and uses it for growth and maintenance.

The term 'quarantine' describes an enforced isolation or restriction of free movement imposed to prevent the spread of contagious disease.

3. MDD health care

3.1. General

Good physical and mental health is a prerequisite for all working dogs. Strength, resistance to disease, fitness, liveliness, endurance, motivation and learning ability are all essential to the maintenance of an effective MDD. These requirements rely on systematic and comprehensive health care coupled with careful training. Neglecting these requirements can result in poor performance, frequent illness and even permanent disability or death. Poorly established vaccination schemes may, for example, result in the spread of epidemic diseases, disability or death.

3.2. Initial screening

Genetically-inherited illnesses and attributes may prevent a dog from developing appropriate skills. An initial screening test when selecting dogs for training should involve a medical examination and a test for desirable and undesirable qualities.

3.3. Principal health requirements

Quality health care relies on the provision of:

- a) sufficient nutrient-rich food, including supplements for growth and hard physical work;
- b) vaccinations against common diseases;
- c) periodic health checks and treatment;
- d) physical and mental exercise;
- e) a high standard of general hygiene;
- f) adequate kennel or shelter facilities;
- g) skilled veterinary support; and
- h) adequate transportation facilities and procedures.

3.4. Exercise

Dogs need to be exercised regularly to remain in top physical and mental condition. This requirement should not be compromised in hot climates just because it is difficult to exercise dogs during the day. Early morning exercise and swimming are good options. Stereotyped exercises should be avoided, to prevent boredom. The type and period of exercise should be adjusted to the dog's individual needs and the environment in the area of operation.

4. Health control

4.1. General

A dog often attempts to continue to work even if something is wrong. It is therefore necessary to understand and be aware of all possible signs of illness or injury. Proper physical care includes routine grooming, as well as daily examination of the dog's body for evidence of parasites, illness or injury.

A medical record/logbook should be maintained for each dog. Information about vaccinations, other prophylactics, de-worming, illness, injuries and any medical treatment should be included in the logbook. Some of the most important health care aspects to address in the logbook are listed in Annex A.

Vaccination cards should be established and maintained for each dog. The dog handler should be given a copy of the vaccination card while the project manager or the veterinarian keeps the original. International vaccination cards for dogs exist in the same way as for humans. Some countries may also have national regulations with regards to vaccination and the use of vaccination cards. If this is the case, the national regulations should be adhered to by the demining organisation.

4.2. Daily health checks

A dog should be examined by the dog handler before, during and after each working day and the dog supervisor should be informed immediately any symptoms or abnormalities are discovered. The daily health check results should be recorded in the logbook.

Serious medical problems or instances where a dog fails to respond to treatment should be reported to a veterinarian for further assessment. Recommended daily health check points are included in Annex B.

4.3. Comprehensive health checks

A more comprehensive examination of dogs should be done periodically, preferably at least on a monthly basis. The examination should be done by an experienced para-veterinarian, a specially-trained dog supervisor or a veterinarian. The examination results should be recorded in the dog's logbook. Recommended monthly health check points are included in Annex B.

4.4. Dog caregiver training requirements

All personnel with direct responsibility for providing care for dogs (normally the dog handlers, but this may also include kennel staff) should have basic training in care and maintenance of dogs covering the following topics:

- a) general health care requirements;
- b) general health and illness hazards;
- c) skin diseases and parasites;
- d) epidemic diseases;
- e) transmission of diseases to humans;
climatic effects (heat and cold) on dogs;
- f) signs and symptoms of poisoning;
- g) health check requirements and procedures;
- h) medical support requirements and procedures;
- i) vaccination requirements;
- j) nutrition and feeding of dogs;
- k) kennelling requirements;
- l) quarantine requirements; and
- m) transportation of dogs, (local, national and international).

5. Medical support for dogs

Demining organisations should treat the health care of their dogs with the same consideration as they treat the health care of humans. At all times when dogs are working:

- a) there should be one person on site with the required knowledge and skill to provide emergency medical treatment for dogs;
- b) suitable medical equipment is to be available on site for the treatment of dogs. This may be the same medical kits used to treat humans; and
- c) a dog emergency evacuation plan should be in place, which includes procedures for retrieving the dog safely from the minefield and transporting the dog via the quickest and safest route to suitable veterinary support.

When dogs are not working i.e. during non-working hours or on weekends:

- d) there should be one person available on call with the required knowledge and skill to provide medical treatment for dogs; and
- e) a plan should be in place for the transferral of sick or injured dogs to a suitable veterinary facility.

6. Dietary requirements

6.1. General

Working dogs need a comprehensive diet containing the correct proportion of nutrients, minerals, and vitamins. Most commercially-prepared dog food has a good balance of essential nutrients and is of adequate quality. Details are shown below:

- a) dry food. Dry food contains about 10% water. All common dry-food brands have a similar nutritional content. Dry food can be stored for several weeks without refrigeration provided it is protected from damp and vermin. However, if dry food is stored for too long, it may lose some of its nutrients;
- b) semi-moist food. Semi-moist food contains about 25% water. It should be stored as for dry food. Semi-moist food has a high sugar content, making it unsuitable for diabetic dogs; and
- c) canned food. There are two types of canned food, complete (containing cereal components) and all-meat (containing meat only). Canned food does not provide a nutritionally-balanced diet and must be supplemented.

Home-cooked food provides a good alternative in situations when ordinary dog food is difficult to obtain or if a dog requires a special diet. It also permits a certain amount of variety in the diet. A nutritionally-balanced diet is easy to prepare using basic ingredients, such as meat and rice. Essential vitamins and minerals can be provided by adding liver, bone meal, corn oil, and salt.

The essential dietary ingredients for the average dog are water, protein, fat, minerals, vitamins and carbohydrate. An adult dog's ability to digest different types of nourishment differs. It is therefore important to feed a dog in the correct proportions.

6.2. Nutritional disorders

Several diseases, including hip dysplasia, are due in part to improper nutrition. A bad diet may result in deficiency diseases, such as rickets (weak and bending bones) or osteoporosis (weak bones which break easily). Insufficient food may also result in a lack of energy, power, concentration, and weight loss. Excess feeding of particular ingredients, such as vitamins and minerals, may cause toxic and allergic reactions in the skin and mucus membranes. Excess feeding can also cause bone deformities, especially in young or large dogs.

6.3. Food requirements

The amount of food required to maintain good health and stamina will vary depending upon the physical demands on the dog. All dogs have different rates of turning food into energy, even within the same breed. The dog's body weight should therefore be checked on a monthly basis, and any significant weight change countered by changes in feeding.

6.4. Liquid balance

Dogs need regular access to fresh water, of the same quality as is available to humans. More water is needed if a dog has kidney problems or diarrhoea. Daily water consumption should be monitored and any obvious deviations from the normal water consumption should be investigated.

7. Kennel requirements

7.1. Basic requirements

To satisfy their basic housing needs, dogs should be provided with a clean, healthy, and low-stress housing environment. Basic kennel facilities should:

- a) be adequately-sized to provide a certain degree of comfort, freedom of movement and freedom for the expression of natural behaviour.
- b) have a non-slip, easy-to-clean dry floor that is safe for the dog;
- c) ensure the dogs have constant access to fresh water;
- d) ensure the dogs have access to natural daylight and fresh air;
- e) include suitable relief and exercise areas;
- f) include lighting to enable observation of the dog at any time; and
- g) ensure that dogs have the company of humans or other dogs.

7.2. Permanent kennel facility

The kennel is primarily a place for the dog to rest or sleep. Only authorised personnel such as handlers, trainers, or kennel attendants should be allowed to enter the kennel without prior authorisation. All permanent kennel staff should have basic training in general dog health care and kennel maintenance.

Plans should be established in the event of a fire or other emergency and kennel staff should be trained in these plans.

Suggested requirements for permanent kennel facilities are included in Annex C.

7.3. Temporary kennel facilities

Temporary kennels are often established when undertaking operations in remote areas. Temporary kennels should, where possible, satisfy all the basic requirements included in clause 7.1 above.

Temporary kennels may be of any construction and in some cases transport cages may be used for short periods. In establishing temporary kennel facilities the following requirements should be followed:

- a) the kennel should be clean, warm, dry and well ventilated. In cold climates it may be difficult to keep a kennel both warm and well ventilated so a compromise must be reached;
- b) the dog's sleeping area should be raised about 10 cm above the ground on blocks or supports;
- c) dogs should be shielded or protected from parasites;
- d) the kennel should be relatively free from distractions or disturbance that may cause a dog to become stressed;
- e) no more than 3 dogs should be housed in the same kennel, and dogs should only be housed together if they are comfortable together;
- f) the dogs should always have access to clean drinking water. There should also be access to clean water for washing dogs and cleaning kennels;
- g) a temporary quarantine facility should be established in the event of illness; and
- h) consideration is to be given to the risk of fire.

7.4. Quarantine requirements

Dogs are placed in quarantine to prevent the transmission of diseases or parasites. A period of quarantine is often required for newly-arrived dogs that need to be medically assessed before joining the other dogs in a kennel. Where applicable, any national quarantine requirements should be followed, both when bringing young dogs into a country for training and operations, and when taking trained dog teams to work in another country. This procedure is costly and time-consuming, and should be included in the early stages of planning

All kennel facilities should have an established quarantine area. The following requirements should be applied in establishing or managing quarantine areas:

- a) the quarantine site should be an adequate distance from the other dog kennels, as far away as possible. Ideally the distance should be 300m or more;
- b) quarantine kennels should ideally have separate water, drainage, and sewage systems;
- c) quarantine kennels should be constructed in a manner that prevents other animals and birds from entering the kennel as these animals may transmit bacteria, viruses, and parasites to other dogs;
- d) quarantine kennels should be constructed in a manner that prevents larger animals from breaking in by force;
- e) waste products from medical treatment should be disposed of carefully to prevent disease transmission. When epidemic diseases are being treated medical waste products should be burned;

- f) personnel required to work with quarantined dogs or in quarantine kennels should have no contact with the other dogs or normal kennels without taking measures to prevent transmission of disease or parasites, such as disinfection or change of clothes, gloves, and boots; and
- g) clothing and equipment that have been used with quarantined dogs or in the quarantine kennel should be stored separately from other clothes and equipment.

8. Transportation of dogs

8.1. General considerations

The following procedures should be followed while transporting dogs:

- a) during transportation, the dog should be accompanied by its handler or another person trusted by the dog. Dogs should not be left unattended unnecessarily during transportation;
- b) dogs should always be transported in portable cages or in specially-designed dog transport vehicles. When a dog is transported inside a vehicle the windows to the dog compartment should be covered with reflective film or insulation material to prevent overheating;
- c) dogs should always be lifted into and out of vehicles. For loading and unloading into low-tailboard vehicles, the dog's collar and chest should be the lifting points. For vehicles with high tailboards, the dogs should be lifted onto the handler's shoulder during loading and unloading;
- d) adequate ventilation should be ensured during transportation, especially when vehicles are stationary in hot climates. The dog compartment or cage should be protected from dry air, exhaust fumes and dust. If dogs are transported using open vehicles on dusty roads, the dog vehicle should lead the convoy to avoid dust from other vehicles;
- e) on long journeys the dogs should drink every second hour and be exercised for at least 10 min every fourth hour. It may be necessary to muzzle the dogs and take them out one at a time during rest periods to prevent dogfights; and
- f) during international transportation by air, dog cages should comply with the regulations provided by the International Air Transport Association (IATA) (www.iata.org). The same cage-size regulations can be applied for land and sea transportation.

8.2. Transport cage recommendations

Transport cages should ideally be made of fibreglass, metal, or rigid plastic as these are stronger and more easily cleaned and disinfected than wooden cages. Transport cages should have a strong frame, without protruding studs or bolts. Metal cages should be avoided in very hot or cold climates due to the thermal conductivity of the metal.

Access to the cage should be via a secure hinged or sliding door, covered with securely-fixed bars, welded mesh, or smooth-expanded metal.

A portable cage should be large enough to permit the dog to shift position and turn around inside, however the cage should not be larger than necessary. A small cage will prevent injury from the dog tumbling around inside the cage during transportation.

A non-slip carpet or other slip-resistant material should cover the floor to prevent injury caused by sliding on the floor.

The main ventilation should be supplemented if necessary by slots or holes distributed regularly around the cage. The dog should not be able to poke its nose or paws through slots or holes in the cage.

Cages that are mainly made of wire-mesh are unsuitable for international transportation by air. Wooden cages may not be robust enough for large dogs.

8.3. Recovery after transportation

After shipment into an area, dogs should be given a recovery period of at least 2 days, to allow for acclimatisation to the new environment. Dogs that are frequently transported may require shorter recovery periods than dogs that are rarely moved.

9. Contagious and Epidemic diseases

Many diseases are contagious, and some of the most contagious are epidemic. The most common epidemic diseases are viruses or bacteria affecting the digestive tract causing diarrhoea and vomiting. Another common epidemic disease is kennel cough, a collective name for a number of different viral and bacterial diseases which attack the lungs. Epidemic diseases spread very quickly and if not contained, may affect all the dogs in a few days. The best prevention is proper hygiene and vaccination.

If a highly contagious or epidemic disease is suspected, the infected dog(s) should be immediately quarantined to prevent the outbreak from spreading. If a dog is suspected to have an epidemic disease during operations, all the dogs in the area should be temporarily withdrawn from operations and assessed to determine those that may have been infected. While this is occurring, all the dogs should be housed separately and exercised in different areas.

If an epidemic disease is suspected in a kennel, all dogs should be taken out and examined outside the kennel. All kennel facilities should be disinfected and all areas used by any of the dogs classified as restricted until it has been established whether one or several dogs have been infected. Dogs should remain separated while infection rates are being established. The infected dog(s) should immediately be quarantined.

It is the responsibility of the demining organisation to report all cases of epidemic diseases to other demining organisations using dogs, and to the NMAA.

10. Dog parasites

Included at Annex D is a list and brief description of common parasites that affect dogs.

11. Responsibilities

11.1. National Mine Action Authority (NMAA)

The NMAA, or an agency acting on its behalf, shall:

- a) develop and implement relevant national standards and other guidelines governing the use of MDD within the programme to include guidelines for occupational health and general dog care. Where applicable, any national regulations concerning the health and safety of working dogs should be incorporated into national standards; and
- b) assist demining organisations with the provision of information on endemic diseases and health hazards that may affect the use of MDD within the programme.

11.2. Demining organisation

The demining organisation employing MDD shall:

- a) establish systems, procedures and facilities to ensure the occupational and general health care of MDD. These are to be in accordance with any national standards and other guidelines governing the use of MDD within the programme or in the absence of national standards and guidelines, with the IMAS 09.4 series of standards;
- b) ensure that all personnel – male and female - responsible for the occupational and general health care of MDD are suitably trained and qualified for the tasks they are required to carry out; and
- c) ensure that suitable veterinary support is available for MDD as required.

In the absence of a NMAA, the demining organisation should assume additional responsibilities. These include, but are not restricted to:

- d) assisting the host nation, during the establishment of a NMAA, in framing national standards for MDD operations to include the occupational and general health care of MDD; and
- e) establish liaison with other demining organisations employing MDD to ensure a consistency in standards for the occupational and general health care of MDD.

11.3. Donors and international organisations

Donors and international organisations should assist the NMAA, or any organisation acting on its behalf, with the development and implementation of national standards and other guidelines on the occupational and general health care of MDD.

In the absence of a national authority donors and international organisations should assist and encourage demining organisations employing MDD to establish and implement systems, procedures and facilities for the occupational and general health care of MDD.

Annex A
(Informative)
Logbook health care check points

Daily logging	Monthly logging
Appetite	Appetite
Thirst	Thirst
Skin condition	Skin condition
Occurrence of ectoparasites	Occurrence of ectoparasites
Condition of the legs	Condition of the legs
Condition of paws and claws	Tail condition
Tail condition	Condition of the anal region
Vagina/penis and testes condition	Vagina/penis and testes condition
Nose condition	Nose condition
Eye condition	Eye condition
Ear condition	Ear condition
Mouth condition	Mouth condition
Throat condition	Throat condition
Teeth condition	Teeth condition
Temperature	Temperature
Other prophylactics	Other prophylactics
De-worming	De-worming
Treatment	Treatment
Use of medicines	Use of medicines
Vaccinations	Vaccinations
General physical/mental health	Pulse condition
Willingness to work and play	Respiration and lung function
	Urine test
	Blood test

Annex B (Informative) Daily and monthly health-check points

Table of recommended daily and monthly health check points

Daily health check	Monthly health check
The dog's general condition and willingness to play and respond to positive stimuli.	The dog's general condition and willingness to play and respond to positive stimuli.
Examine the skin and coat and let the hand run over the body to feel for wounds, ticks, thorns and areas of matted hair, or lumps and bumps.	Check the appetite and faeces by asking the dog handler.
Examination of breast, legs and paws. Look particularly for hot spots, swollen joints, dry pads, long or damaged claws, and fungus diseases on the feet. Carry out de-worming	Check the skin and coat for wounds, ticks, thorns and areas of matted hair, or lumps and bumps. Check for parasites, and carry out de-worming
Examine the tail, anal region and anal sacs. Look for swelling and irritation.	Examine the nose, mucous membranes, mouth, throat, tongue, and teeth.
Examine the vagina/penis and testes.	Examine the eyes and ears.
Examine the nose, eyes, and ears.	Check visually the lung functions and the hydration status.
Examine the mouth and throat. Look for swelling, changes in colour, inflamed gums, bad breath, foreign bodies/objects loose or broken teeth and accumulated tartar.	Inspect lymph nodes for swelling or sore points.
Check the temperature if there is any doubt about the dog's health.	Check the pulse and temperature.
Check date of next vaccination	Check vaccination status

Annex C (Informative) Permanent kennel facility requirements

Construction	The kennel should be purpose built, constructed of brick/breeze blocks, or wood covered by tiles or other appropriate surface material. There should be no sharp, poisonous, or hazardous objects within reach of the dog. The floor should have a surface impervious to water.
Temperature and ventilation	The kennel should be well ventilated and, if necessary, protected against uncomfortable chill, heat, dry air, and humidity. The shelter should facilitate a comfortable inside temperature (10 – 30 °C) independent of the outside weather conditions. The use of air conditioning may be necessary under extremely hot and humid conditions, but should be avoided if possible as it may interfere with the dog's adaptation to field conditions.
Kennel size	The kennel-size requirement depends on the size of the dog, the number of dogs in each kennel, and the length of time the dog spends in the kennel. MDD are normally active outside the kennel during the day. Thus, it may not be necessary to establish large individual kennels. Each kennel should, however, be large enough for the bedding to be placed at the back and for the dog to stand, turn, lie, and change position without any discomfort.
Lighting	The kennel facility should be equipped with a lamp to enable observation and assessment of the dogs at any time.
Running facility	A separate run associated with each kennel is desirable.
Visibility	The environment immediately outside the kennel should be visible to the dog.
Inside material	All materials used inside the kennel should be easy to change, wash, and dry to minimise the spread of parasites and diseases.
Relief area	The kennels should be close to an exercise/relief area. The relief area should be fully enclosed to a height of approximately two metres.
Hygiene	There should be access to water for cleaning. A hygienic method should be established for faeces disposal. If there are national health and safety requirements in country, these should be followed.
Drinking water	The dog should have constant access to clean drinking water.
Food preparation	The kennels should be close to a hygienic food-preparation area. There should be a separate store for dog food, which must be protected from damp and vermin. A freezer and refrigerator should be available if fresh foods are used.
Cleaning/ treatment area	There should be a bathing, grooming, and treatment area for the dogs.
Quarantine facility	There should be a facility available for the quarantine of infectious dogs to protect the rest of the dog population.
Sleeping place	The dog bedding should be warm and raised off the ground.

Annex D (Informative) Parasites that affect dogs

Parasite name	Characteristics	Ecto	Endo
Demodex	Carried by most dogs, these mites are usually no problem, but may be a nuisance at times of stress or in animals whose natural defences are not fully developed.	X	
Sarcoptes	These are commonly known as 'scabies'. Sarcoptes are small parasites that burrow through the skin, producing tunnels in which they lay eggs.	X	
Otodectes	These normally appear in the dog's ears where they can cause inflammation. It is the only type of mite visible to the human eye and then only rarely as tiny, white, moving dots.	X	
Ring worm	An infectious fungus which grows on the skin and in the coat.	X	
Lice	There are two different types of louse; biting lice which eat skin flakes, and sucking lice which penetrate the skin to feed on tissue fluids. Sucking lice cause greater irritation.	X	
Fleas	When a flea bites, it injects a form of saliva which stops the blood from clotting whilst it feeds. The saliva contains chemicals which can cause an allergic reaction.	X	
Ticks	Ticks hang on to the dog's hair and penetrate the skin with their mouths to suck blood. Ticks can transmit several serious diseases but this takes time, and therefore it is important to remove the tick as soon as possible.	X	
Tapeworms	Tapeworms are transmitted by fleas in which tapeworm larvae develop. Normally the clinical symptoms are vague or absent, but may contribute to exhaustion, diarrhoea, weight loss, and nervousness.		X
Roundworms	The two most important types of roundworms are <i>Toxocara canis</i> and <i>Toxascaris leonina</i> which both live in the small intestine. They are particularly harmful to young dogs. Other roundworms infest the large intestine, blood vessels, and respiratory system. These worms can infect humans.		X
Hookworm	Hookworms are bloodsuckers and can cause anaemia, diarrhoea, and poor condition.		X
Whipworm	Whipworm is a larger type of hookworm. Severe infection may cause weight loss, anaemia, diarrhoea, and poor condition.		X

Heartworm	European heartworm is transmitted via slugs eaten by the dog. Its larvae infect lungs and blood. The American and Asian parasite is transmitted by mosquitoes and fleas and infects the pulmonary artery and the right ventricle. The infection is often fatal. Because treatment is tedious and not always effective, and because of the longevity in host animals, rejection of dogs with the diagnosis of heartworm should be considered. This applies especially to organisations that do not have access to proper quarantine facilities.		X
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