**AIM**
To develop an understanding of routine treatments for healthy animals

**DESEXING**
De-sexing is the removal of the male or female reproductive organs. Depending on the sex of the animal de-sexing involves one of the following procedures:

- *castration*
- *vasectomy*
- *spay*
- *tubal-ligation*

**CASTRATION**
Male animals not wanted for breeding are castrated. Unfortunately this does not occur enough in a domestic situation. The operation is performed under general anaesthetic and both testicles are removed, thus removing the source of sperm and the male sex hormone (testosterone).

**Horses:** Colts and Stallions are castrated using a knife or scalpel and a triple crush emasculator.

**Cattle:**

<table>
<thead>
<tr>
<th>1. Calves</th>
<th>a/ Bloodless castration</th>
<th>Elastrator or burdizzo</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b/ Removal castration</td>
<td>Knife or scalpel</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Bulls</th>
<th>a/ Bloodless</th>
<th>Burdizzo</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b/ Removal</td>
<td>Knife or scalpel and triple crush</td>
</tr>
</tbody>
</table>

**Sheep:**

<table>
<thead>
<tr>
<th>1. Lambs</th>
<th>a/ Bloodless castration</th>
<th>Elastrator or daroux</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b/ Removal castration</td>
<td>Knife and teeth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lucke knife</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lamb clam</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Rams</th>
<th>a/ Bloodless</th>
<th>Burdizzo</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b/ removal</td>
<td>Knife or scalpel and triple crush</td>
</tr>
</tbody>
</table>
Pigs:
1. Piglets: knife or scalpel
2. Boars: knife or scalpel and triple crush

Cats
a/ Clamp the cord - tie off each with a suture & remove testicle.
b/ Tie knot in the cord and remove testicle

Dogs
Clamp cord and tie off

VASECTOMY

This is an alternative method to castration, for sterilising male animals. It may be used if “sterilisation” alone is required. It involves removing a segment of the right and left vas deferens (eg. tubes that sperm move along from the testicles to the urethra). Dogs treated this way will still have sexual responses, but are unable to fertilise a bitch.

SPAYING

Female animals are spayed to prevent further breeding. This is an operation where the uterus, tubes and ovaries are removed. For most mammalian animals, the operation may be made through either a cut in the mid line (eg. stomach); or alternatively a cut in the flank (eg. side).

Cats:
2 methods
1. Flank:
   This is used for easy animals & queens in oestrus
2. Mid Line (Stomach):
   This is used when Pregnant and in Oestrus. This is a slower technique.

Dogs: Mid Line of Stomach - Most common in Australia.
Flank - not used much in Australia, but popular overseas.

Cattle: Additional reasons are the heifers and younger cows develop will in carcase conformation after spaying. Older cows, while not improving in carcase conformation, will fatten readily for market.

Two methods are used:

- Flank spaying - used on both cows and heifers. The left flank is usually chosen although the operation can be performed form either side. As a surgical operation, the area should be shaved but in station practice is usually clipped.
- Vaginal or Passage spaying - used only on cows as there is plenty of room. Infection is less likely. The incision is made a bit above the mid-line at the end of the vagina close to the cervix.

Mares, ewes, sows, does, etc. can be spayed but it is more practical and economical to prevent breeding by keeping the away for entire males.

TUBAL LIGATION

Here the Fallopian tubes are ligated to prevent the eggs moving from the ovaries to the uterus.
CASTRATION PROCEDURE

Castration is performed to eliminate aggressive behaviour in entire males not required for breeding. Another reason is to remove abnormalities such as hydrocele, tumours, inguinal hernia and irreparable testicular damage. This is done from the age of 12-24 months or when masculine characteristics have developed.

Prior to castration a physical examination is carried out to inspect the scrotum to make sure both testicles have descended.

There are a number of different methods of castration:

1. The operation may be performed standing up, or
2. Pulled down and hind limbs restrained,
3. Use of anaesthetics is optional,
4. Instruments used include:
   - scalpel/knife
   - triple crush
   - ercaseur emasculator

Preparation

Ideally the castration is done on a well grassed area (lawn) to avoid dust and bacteria.

If the operation is to be performed on a standing animal it will require a tranquiliser and normally a nose twitch. Anaesthetic is then (optional) injected into each side of the scrotum into the testicles and spermatic cord.

If the animal (e.g. colt) is to be castrated under a general anaesthetic the animal is given drugs for a 15-20 minute operative time, and the patient is pulled down on its side with its head held and the upper hind leg tied forward. The area surrounding the scrotums is disinfected.

Surgical Procedure

The testicle is grasped between the thumb and fore-finger and an ‘bold’ incision is made deep (into the testicle along the side and extending low down. It must be long enough to allow the testicles to be squeezed out and low down to allow for drainage.

Other important factors for successful results are the removal of as much spermatic cord and vaginal tunic as practical.

After the incision has been made pressure is applied to cause the testicle to ‘pop out’ through the incision. It is then grasped and the subcutaneous tissue is stripped from the tunic. The spermatic cord is separated from the vas deferens and emasculated for 2-4 minutes. The vaginal tunic is then emasculated for 1-2 minutes.

Repeat for other testicle.
**VASECTOMY**

This refers to the removal of a section of each vasa deferetia.

Such removal prevents the passage of spermatozoa from the epididymis and does not interfere with the production of testosterone resulting in the animal having all the characteristics of a normal entire male. It is performed for teaser animals used to identify mares in oestrus.

A tetanus vaccination is given and the operative area is swabbed again with disinfectant. Pour ½ Litre of vegetable based oil into the sheath so that in the event of swelling the penis can still be extended for urination.
CASTRATION OF DOGS

Female dogs can be more of a problem than dogs than males. Despite this, males are still often castrated to settle them and weaken their instinct to wander from home. Castration of the male dog does not affect temperament, appearance or much else other than the ability to reproduce and the tendency to stray. Dogs are commonly castrated at about 8 months.

CASTRATION OF CATS

Males that are not castrated will start marking their territory at 9 to 12 months of age, by spraying urine. If kept in a house, this can be very unpleasant. Castration of a male at about 8 months is easy, effective and relatively inexpensive. Castrating an older male though may not change habits that have been set.

There are hormone drugs and implants which can prevent your dog or cat from breeding for varying periods of time. However, if you are not planning to breed from your pet in the future, surgical de-sexing is the best and safest method in the long term as prolonged use of hormones can cause serious health problems.

POST OPERATIVE TREATMENT

The animal must be confined to a well bedded loose box or cage for 24 hours. Then it may be exercised for 20 minutes daily until healed. Watch closely for signs of infection and treat accordingly.
EUTHANASIA

Euthanasia is the killing of an animal quickly and painlessly.

The decision to do this may be advised by the veterinarian, and taken by the person responsible for an animal, when it is judged to be appropriate. In many countries, euthanasia of animals is subject to legal conditions (e.g. an Animal Welfare Act of Parliament).

In America, guidelines for euthanasia are published by the American Veterinary Medical Association Panel on Euthanasia. In Canada, the Canadian Council on Animal Care, 1980, established acceptable methods of euthanasia.

The most acceptable methods are generally those that initially remove sensitivity in the central nervous system, hence ensuring the animal will not feel pain as it dies. For this reason, the most acceptable technique for killing most animals is to administer an overdose of barbiturates (usually with an intravenous or intraperitoneal injection).

Physical methods (e.g. cervical dislocation), may be acceptable for some small animals, such as mice. Such methods are generally inappropriate for large animals.

Carbon Dioxide gassing in an uncrowded chamber has appeared satisfactory for some but not all types of animals.

Ether can also be used humanely for many animals, but it must be handled and administered properly. Among other things it is highly flammable, and for this reason often avoided. Avoid using chloroform as it is potentially dangerous to humans.

Other methods which have been used include:

- Gassing (e.g. Nitrogen, Argon, Carbon monoxide)
- Other pharmaceuticals (e.g. Chloral hydrate, T-16, Pentobarbital combinations, etc.
- Other Physical Methods (e.g. Penetrating captive bolt, Gunshot, Decapitation, Electrocution, Microwave Irradiation

The following injectable substances when used alone are condemned as totally unacceptable by the AVMA Panel on Euthanasia:

- Strychnine
- Nicotine
- Caffeine
- Magnesium sulphate
- Potassium chloride
- Any Neuromuscular blocking agents

AFTER DEATH

An animal must be examined after it is killed to confirm it is dead. The absence of breathing is not enough! The heart must also be checked! (NB: Animals euthanised with Carbon dioxide will sometimes stop breathing, but still retain a faint heartbeat).
ANAESTHESIA AND ANALGESIA

Anaesthetics, analgesics or tranquillisers may be used to immobilise or provide pain relief to an animal. These three types of drugs are different to each other in a subtle way.

- An Anaesthetic is a drug that stops the animal feeling any pain.
- An Analgesic is a drug that stops pain being felt, but does not interfere with tactile senses.
- A Tranquilliser is a drug that has a calming or relaxing affect.

Animals that are suffering pain (perhaps due to a serious injury or disease) may require temporary or ongoing treatment to relieve their pain.

Part or all of an animal’s body may need to be treated temporarily for pain relief, or to prevent unwanted movement, while a procedure is carried out (eg. setting a broken bone, or conducting a surgical procedure). Muscle relaxants or paralysing pharmaceuticals (eg. succinylcholine or other curariform chemicals) are not anaesthetics! They shouldn't be used as a sole means of anaesthesia during surgery; but they could be used in conjunction with another analgesic.

PREPARING AN ANIMAL FOR SURGERY

The area of tissue to be cut needs to be free of hair (or feathers), and sterile.

Preparation may involve the following procedure:

1. Clip around the area to be cut. Isopropyl alcohol may be poured on the area to help the clipping. Any clipped hair or debris must then be vacuumed or brushed away.
2. Scrub the area with a product such as Chlorhexidine (Nolvasan) or Providone-iodine (Betadine) and rinse with tap water.
3. Soak a generous amount of white gauze sponges with 70% isopropyl alcohol, and then wipe the scrubbed skin, working from the place to be cut outwards. Ensure any remaining hair or debris is removed. Repeat the procedure several times with a new, clean, piece of gauze, each time.
4. Rinse the area with a sterilant (e.g. sterile saline water, or 70% isopropyl alcohol).
5. Ensure sterilant flows from the centre of the area to the outside -not the reverse.
6. Apply 70% Isopropyl alcohol again then allow to dry.
7. Spray a mist of 2% Nolvasan or Betadine, over the area.
8. Separate the surgical site from untreated (unsterilised) areas by draping the area to be operated on. This involves placing sterile material (cloth) in position around the area to be cut. Be sure to lay the drape down without dragging it at all. Ensure any unsterilised part of the animals body is covered by the drape (including between the surgeons gown and the operating table. Secure drapes to each other and to the patient’s skin with a towel clamp. Be sure to tuck towel clamps underneath the drapes, but avoiding them lying on the animals skin.
STERILISING EQUIPMENT

All tools or equipment used in an operation or for internal examination should be sterilised.

The following methods can be used for sterilisation in a veterinary practice:

Autoclaving

This involves putting equipment inside a pressurised compartment and then sterilising by using steam under pressure, usually for 30 mins. (Note: An autoclave is in fact similar to a pressure cooker).

Radiation

Microorganisms are destroyed by high energy ionising radiation. This technique may be used to sterilise materials which may be affected by heat or chemical sterilisation.

Filtration

Filters may be used to remove certain microorganisms from fluids (e.g. A 0.2 micron filter will remove bacteria from a liquid).

Chemicals

Immersing equipment in certain chemical solutions can be an effective sterilisation. For example: Dry instruments left to soak for 3 hours in a common disinfectant such as Glutaraldehyde (e.g. Cidex)

Gas

Equipment is placed in a sealed compartment, and then ETO gas (e.g. Ethylene Oxide) is released into that compartment. Anything treated must be dry before being treated. This is a very toxic and flammable gas; and equipment must be well aired after treatment. This treatment is particularly useful for heat sensitive equipment or materials such as suture material, plastics etc.

MANAGING A PREGNANCY

The diet during the first half of a pregnancy should be at normal maintenance level.

During the latter stages of pregnancy close monitoring of the diet in relation to body weight (dam and foetus) is paramount i.e. the dam must be on a rising plane of nutrition. If the nutritional needs of the foetus are not provided in the dam diet, foetal demands on her body stores will leave her in a state of low body condition at the start of the lactation period.

On the other hand, do not overfeed as overweight females invariably have difficult births (Dystokia).
At the time of parturition (birth) the dam should be as comfortable as possible. If giving birth in an enclosed area (as opposed to an open paddock) a soft absorbent bed must be provided in a dry, cool/warm, draught-free environment. Light should be subdued.

Safety rails in farrowing pens for pigs and whelping boxes for the larger breeds of dogs are an absolute necessity to prevent the mother from rolling/lying on the young.

**Care for Brood Mare in last 2 weeks of Gestation**

The following points must be adhered to if strong healthy foals are to be the result of trouble free parturition:-

1. The diet must be balanced, palatable and laxative. If the hand fed, give plenty of bran and make sure the dung is fairly soft just prior to foaling. Under conditions of extreme cold, extra feed in the form of good quality Lucerne hay and grains must be given otherwise some abortions will occur.
2. Exercise is essential for mares confined to loose or enclosed boxes. This can be in the form of being led on a halter or turned out into good quality pastured paddock by day.
3. Fresh water should be available at all times.
4. Regular checks on paddock mares is essential - A veterinary check either the day before or on the due date of foaling is advisable.
5. Paddock mares should preferably foal on green feed – grass or crops. Stabled mares should foal in a large base with a good depth of good quality bedding straw.

The signs when a mare is due to foal are:

a) Udder starts to spring (fill out). Wax plus (‘waxing’) tend to come out of the end of the teats. These are only a guide as occasionally maiden mares do not produce milk. Waxing does not always occur.  
b) Restlessness – a mare tends to get away on her own if in a paddock with others, and lie down. Sometimes there are false alarms.  
c) Vulva becomes enlarged and loose.  
d) Body temperature drops 1°C in the 24 hours prior to foaling. This is the most reliable sign.
Mares that have been “Caslicked” (vulva that have been sown up to prevent wind sucking through the vagina) must have the stitches removed.

In general, mares have little trouble in foaling and are best left undisturbed during parturition. If a mare is noticed having difficulty call a vet immediately as the trouble is usually serious when it does occur.

### GESTATION PERIODS

<table>
<thead>
<tr>
<th>Animal</th>
<th>Mean</th>
<th>Known range</th>
</tr>
</thead>
<tbody>
<tr>
<td>mare</td>
<td>336 days</td>
<td>321-361</td>
</tr>
<tr>
<td>cow</td>
<td>282 days</td>
<td>274-291 (bull calves longer)</td>
</tr>
<tr>
<td>ewe</td>
<td>150 days</td>
<td>140-160 (wool breeds longer than mutton)</td>
</tr>
<tr>
<td>sow</td>
<td>113 days</td>
<td>110-116</td>
</tr>
<tr>
<td>nanny</td>
<td>151 days</td>
<td>147-155</td>
</tr>
<tr>
<td>bitch</td>
<td>63 days</td>
<td>None available</td>
</tr>
<tr>
<td>cat</td>
<td>59 days</td>
<td>52-69</td>
</tr>
</tbody>
</table>

### SELF ASSESSMENT

Perform Self Assessment Test 10.1
If you answer incorrectly, review the notes and try the test again.

### SET TASK

- Make contact with a stud or an animal breeder and observe parturition (birth).
- You may do this through your local veterinarian; or through any other contact you have involved in animal health and care.
- If this is too difficult to observe in real life, you may investigate this subject by undertaking research in either books or on the internet, with a view to finding photographs or illustrations to study.
- Make notes of what you observe and learn.

### ASSIGNMENT

Complete Assignment 10