Tikrit University
College of Veterinary Medicine

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Subject name: **Preanaesthetic Medication**

Subject year: **surgery \ 4th stage**

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# Preanaesthetic Medication

**Indication of pre-anesthetic drugs:-**

1-To calm or sedate an exited, frightened animal to prevent fear and struggling at induction and/or recovery.
2-To reduce the amount of general anesthesia required to induce sedation.
3-To provide analgesia during surgery and to minimize pain during recovery .
4-some drugs have effect of analgesic, sedation and muscle relaxation.
5-To decrease secretions of the salivary glands
6-To decrease gastric fluid volume and acidity.
7-prevent vomiting by reducing of GIT motility.
8- prevent bradycardia or arrest by block vagal reflex .

***common preanesthetic groups:-***

1-Anticholinergics (Parasympatholytics).
2-Phenothiazines.
3-Benzodiazepines.
4-Opioids.
5-Alpha 2-agonists.

***1-Anticholinergics:-***

***A- Atropine Sulphate:-***

1-block acetylcholine (Ach) at the post gangelunic termination of autonomic nervous system and act as parasympatholytic
2-Oral, pharyngeal, and respiratory tract secretions are decreased and bronchi are dilated.
3-Motor and secretary activity in the gastrointestinal tract is decreased therefore used as anti-spasmotic to control diarrhea and vomiting.
4-prevent bradycardia or arrest of heart by block vagal reflex .
5-mydriatics (Dilates the pupil due to relaxation of sphincter of iris).
6-Tear formation is decreased in awake and anaesthetized dogs.
7-its contraindicated in case of glaucoma due to increase of intraocular pressure.

8-Use as antidote for organo-phosphorous intoxication.

9-contraindicated in constipation and ileus cases, which lead to farther reduce of intestinal peristaltic movement.

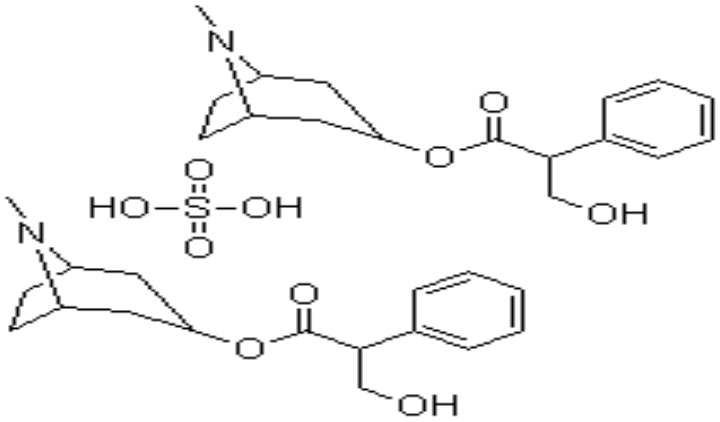
**route of administration & dosage:-**

-Can be given by: SC, IM, and IV routes.

-Dose: Dogs ( 0.02 to 0.05 mg/kg B.W. ).

Cats (0.1 mg/kg B.W.)

Horse (0.02 mg/kg B.W.)



***B- Glycopyrrolate:-***

1-Is a synthetic, Quaternary ammonium, compound. Similar to atropine, but longer acting.

2-Can be given by: SC,IM, and IV routes.

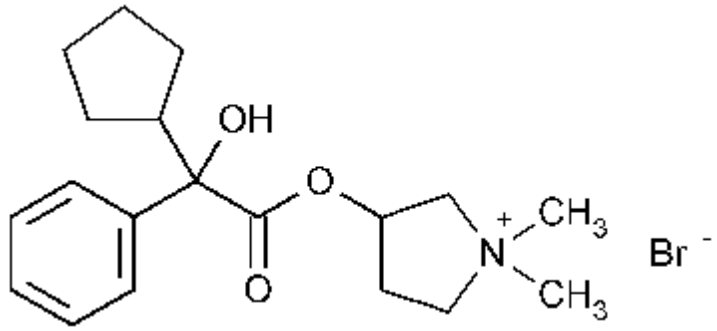
3-Dose: Dogs and Cats (0.005 to 0.01 mg/kg)

Ruminants (0.02 mg/kg)

4-Used mainly in ruminants.

5-More effective antisialagogues effect, may persist for up to 7 hr.

6-There is less papillary dilation with glycopyrrolate.




***2-Phenothiazines (tranquilizer groups):-***

1-A group of tranquilizers are used to induce sedation and relieve anxiety before induction of anesthesia.
2-In addition, they can be used to quiet patients for physical examination, diagnostic procedures, or transport and to prevent animals from licking wounds or chewing bandages and splints.
3-Can be given orally, but response is slow and un-predictable. Usually given parenterally by IM route 20 to 30 min before induction of anesthesia.
4-Shortly after administration, animals relax with their heads hanging and ears drooping.
5-The penis in the male animals protrude out of the sheathes .
6-The eyes can appear glazed and the nictitating membrane often protrudes Some animals lie down.
7-Phenothiazines are also effective antiemetics and reduce the incidence of perioperative vomiting.

***A- Acepromazine (ACP) (calmivet):-***

1-The most commonly used tranquillizer in veterinary practice, and probably among the safest and least expensive agents for use when a simple calming effect is desired.

2-Clinical doses (up to 0.2 mg/kg B.W.) are effective for about 4-6 hours.

3- Doses: Dogs and Cats ( 0.05 to 0.1 mg/kg B.W.) (lower dose IV, higher IM)

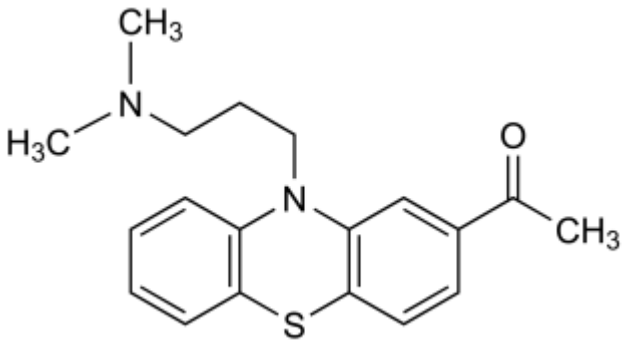
Oral dose in Dogs and Cats, (1- 3 mg/kg B.W.)

Horses and Cattle ( 0.02mg/kg IV; 0.05mg/kg IM)

4-ACP has a relatively weak antihistamine effect.

5-The drug causes paralysis of the retractor penis muscle and protrusion of the flaccid penis from the prepuce in bulls and stallions; it was often given to facilitate examination of the penis.

In horses, however, physical damage to the dangling penis may result in swelling and failure of the organ to return within the prepuce when the drug action ceases. This event, which may eventually necessitate amputation of the penis.




**B – Propriopromazine or Propionylpromazine (Combolen):-**

1- has been widely used for sedation and premedication of both small and large animal patients.

2-Its actions, the sedation it produces and its side effects are very similar to those of acepromazine.

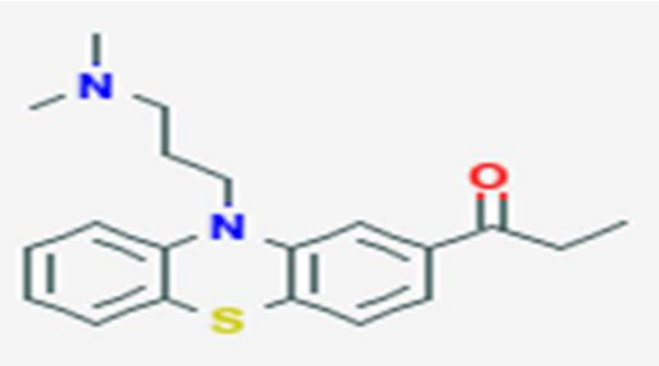
3-Effect similar to ACP.

4-Can be administered by IM or IV routes.

5-Can be used in all species, except in male equine, because there have been reports of permanent prolapsed of the penis in this specious.

6-Doses: In horses (0.15–0.25mg/kg B.W. )

in dogs (0.2–0.3 mg/kg B.W.)




***3-Benzodiazepines (Sedative groups):-***

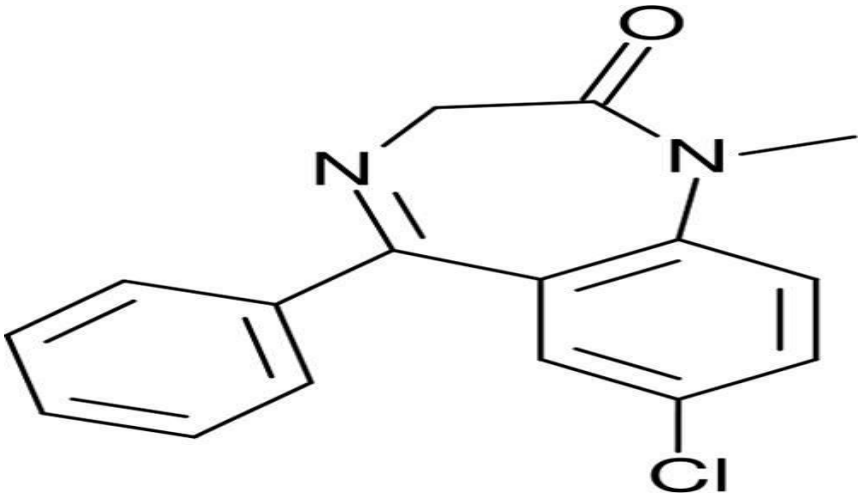
A group of drugs which show the following properties:-
1- Dose-related tranquillizing
2- sedative and hypnotic properties.

3-Skeletal muscle relaxation.
4- Anticonvulsant activity.
5- Appetite stimulants in cats.

**A- Diazepam (Valium):-**

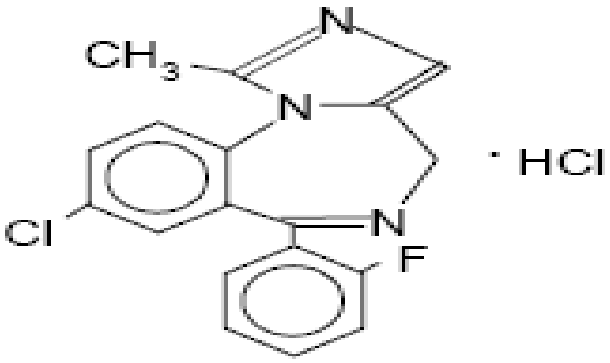
1-Is a safe, effective sedative in dogs but is not a reliable sedative in cats. Diazepam has calming, muscle relaxant, and anticonvulsant effects.
2-It is frequently given before ketamine to prevent muscle tremors and seizures. 3-It can , however, also given before propofol or thiopentone to reduce the amount of drug required to induce anesthesia.
4-Oral doses of up to 5 mg/ day in dogs used to control behavioral problems without producing unwanted sedation.
5- **The recommended IV doses**:-
in dogs **(0.5-1 mg/kg B.W.)**.
)cattle & sheep **( 0.25 – 0.5 mg / kg B.W**.
Horse **(0.2 mg / kg B.W.)**

6- Diazepam solution should be injected slowly to decrease the incidence of venous thrombosis.




***B- Midazolam (Versed):-***

1-It is water-soluble benzodiazepine, unlike diazepine, can be mixed with other preanesthetic and anesthetic agents.
2-It is less irritating to tissues and more reliably absorbed after IM or SC injection.
3- Is often given with ketamine **( 0.2 mg/kg of medazolam and 10 mg/kg ketamine IM).**
4-Has been recommended for premedication of dogs before induction of anesthesia ( with ketamine or thiopentone).
5- Midazolame has been used as an appetite stimulant in dogs and cats.



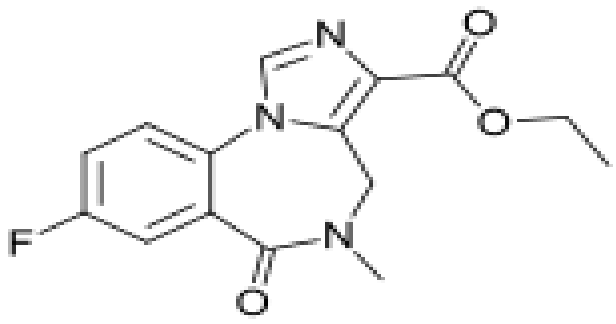

***C- Benzodiazepine Antagonist (Flumazenil ) :-***

1-Effectively antagonizes CNS actions of benzodiazepines, because of its high affinity for benzodiazepine receptors.

2-Flumazenil may be useful for the reversal of benzodiazepine effects after either therapeutic use or overdoses.

*3-Flumazenil is administered by rapid IV injection. It is rapidly distributed and also rapidly metabolized in the liver.

*4-Dose of antidote (0.001-0.02mg/kg)




***4-Opioids (Narcotic groups):-***

1-The term narcotic has traditionally been applied to the class of drugs derived from morphine. This term replaced with opioid.

2-Opioids are a versatile class of drugs that may be used as pre-anesthetics, induction agents, and analgesics.

3-As a group they have excellent pain-relieving properties and sedative effect

***Uses in veterinary anesthesia:-***

1-Opioid are common component of preanesthetic protocols.

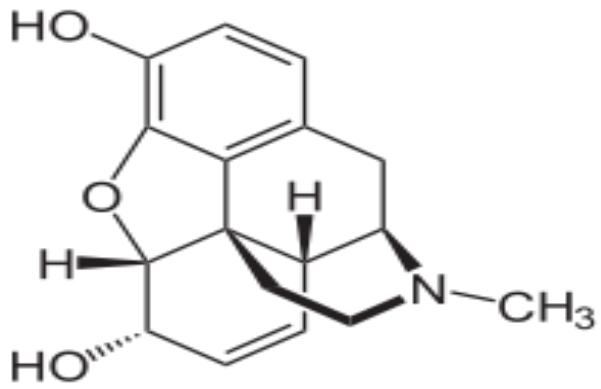
2-To prevent and treat postoperative pain.

3-Used at higher dosages and in combination with a tranquilizer ( acepromazine, medetomidine ) to achieve a state of profound sedation and analgesia termed neuroleptanalgesia.

4-**The opioids are classified as**: Opioid agonists, Agonist-Antagonists and Antagonists.

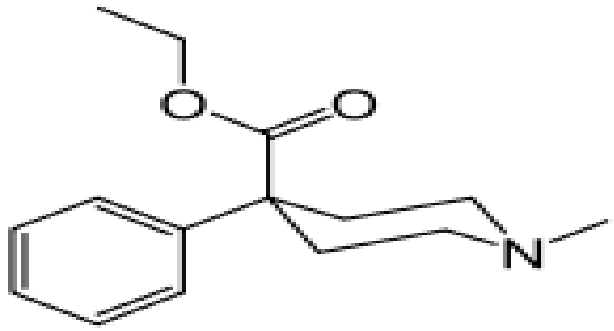
## *A- Morphine:-*

1-Is an opioid agonist. Its major effect is analgesia. Some times used as a preanaesthetic agent or to provide post-operative analgesia.
2-Dose and uses: Not recommended for use in horses, cow, sheep, and goat.
3- Morphine induces sedation in dogs **(0.1 to 0.5 mg/kg B.W. , IM)**.and has marked effect as a narcotic ,producing profound sleep within half an hour after being administered hypodermically.
4-In cats, morphine given SQ at a dose of**( 0.1 mg/kgB.W.),** and analgesia lasts for less than 4 hr.



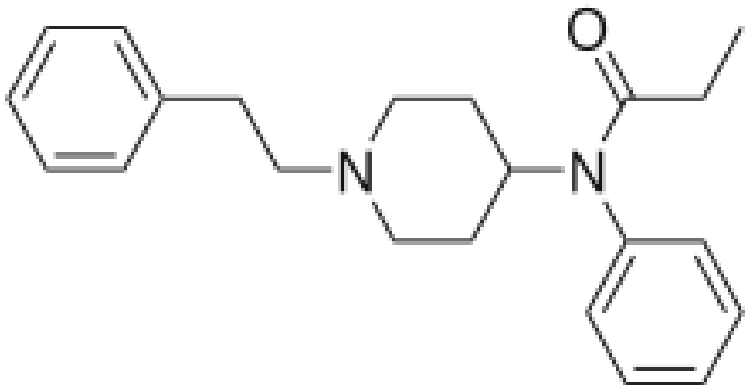

## B- Pethidine (meperdine):-

1-Potency is one-tenth that of morphine.
2-It has a spasmolytic effect similar to atropine and reduces salivary and respiratory secretions.
3-it appears to relax intestinal spasm and so is particularly useful in equine spasmodic colic
4-When used as a pre-anesthetic, it reduces the amount of general anesthetic needed.
5-Doses:
large animals of 1 mg/kg by i.m. injection
Dogs 1–2 mg/kg produce generally satisfactory analgesia.
Cats i.m. doses of 10–20mg / cat may be given.




***C- Fentanyl:-***

1-Potent analgesic (approximately 100 times more potent than morphine).
2- It has rapid onset and a short duration of action.
3-It cause sever depression in respiration, and bradycardia due to vagal stimulation.



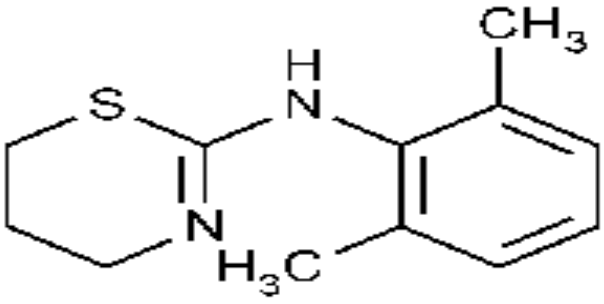

***5-Alpha 2-Receptor Agonists (Neurolept analgesic groups):-***

1-These receptors hold promise because, when activated, they induce sedation, analgesia, anxiolysis, and sympatholysis in most mammalian species.
2-These agents are the most predominant sedatives in current usage in veterinary medicine.
3-The two predominant α 2-adrenergic agonists used in small animal practice are xylazine and medetomidine and in large animal practice, xylazine and detomidine.

4-In veterinary practice the major drugs used are **Xylazine, Detomidine, Medetomidine and Romifidine; Clonidine**.

***A- Xylazine (Rompun, Anased) :-***

1-Xylazine was the first α 2-agonist to be used as a sedative, analgesic and muscle relaxant agent in all animal species.
2-There is great variation in susceptibility to the drug between different species of domestic animals.
3-Cattle are very susceptible; horses require some 10 times the doses given to cattle and even then the degree of sedation achieved is considerably less.
4-The drug may be administered by IV and IM routes mainly, or in some species of animal, subcutaneous route. Also epidural injections used successfully in some animals.
5-Sedative effect of xylazine cause lowering of head drooping of eyelid and lower lips.




**Main said effect :-**

*** On cardiovascular system**

After IV injection of rompun An initial rise in arterial blood pressure followed by a state of hypotension

Brady-cardias due to its effect on A – V block (atrio – ventricular).

***On respiratory system**

cause different degree of respiratory depression.

***On gastrointestinal tract**

Depression of GIT motility

Increase salivation and fermentation in ruminant (bovine mainly)

Reduce pancreatic secretion lead to transient hyperglycemia.

***On genital organ**

is contraindicated in late stage of gestation due to oxytocine like effect causes uterine contractions and induce premature labour.,
Contraindicate it in cattle or horses receiving ovum transplants since this may reduce the chance of implantation.

***On CNS**

due to depression of CNS it prolong the recovery time when it is used as premedication of general anesthesia.

**Dosage:**

Cattle 0.05 – 0.1 mg/kg (sensitive)

Horse 0.5 – 1.1 mg/kg

Dog 2 mg/kg

***Alpha 2- Adrenoceptor Antagonists:-***

1-The central and peripheral effects of the 2-adrenoceptor agonists can be reversed by the use of specific antagonists.
2-These include: Idazoxan, Tolazoline, Yohimbine, and Atipamezole

3-Yohimbine and atipamizole are the most potent and specific antagonists and are the most commonly used in veterinary practice.
4-The antagonizing α 2- agonist agent has been shown to be effective in reversing the sedative and analgesic effects of xylazine, detomidine, and medetomidine in cats, dogs, sheep, cattle, horses, wild and lab. Animals.

***Neurolept analgesia:-***

Any combination of an analgesic and a tranquilizer Or combination between Sedative + Narcotic analgesic
)oxymorphone and acepromazine(
)Acepromazine + Fentanyl(
xylaxizine + Morphine) (
)xylaxizine + Butorphenol(
Indications for short procedures (i.e. wound suturing)
Disadvantages:-

1-Animal may defecate or vomit
2-Animal may become hyperactive to auditory stimuli
3-May hyperventilate, or pant a lot
4-May cause bradycardia.