

Drug Chart for Castration Procedure

Drug name	Concentration (mg/ml)	Dose (mg/kg)	Duration	Type of drug	Route of administration	Example calculation (Horse weight is approx 450kg)	Contraindication
Lidocaine hydrochloride	2% solution 20mg/ml	2mg/kg	1.5 - 3 hours	Local anesthetic	IV	$(2\text{mg/kg} \times 450\text{kg})$ $\div 20\text{mg/mL}$ $= 45\text{mL}$	<ul style="list-style-type: none"> ● Excitability ● Muscle tremors ● Convulsions ● Not to be used in horses with liver disease, congestive heart failure and respiratory depression
Romifidine	1% 10mg/ml	0.02-0.1 mg/kg	2-3 hours	Alpha-2 agonist	IV	$(0.1\text{mg/kg} \times 450\text{kg})$ $\div 10\text{mg/mL}$ $= 4.5\text{mL}$	<ul style="list-style-type: none"> ● Changes in heart rhythm ● Decreases GIT motility and may cause colic ● Not to be used in horses with severe liver and kidney problems

Detomidine hydrochloride	10mg/ml	0.005-0.01 mg/kg	40 minutes	Alpha-2 agonist	IV or IM	(0.01mg/kg×450kg) ÷10mg/mL =0.45mL	<ul style="list-style-type: none"> ● Not recommended for use in horses for human consumption ● Not for use in animals with cardiac disease and hypotensive/hypovolemic ● Ataxia
Butorphanol	10mg/ml	0.01-0.1 mg/kg	45 minutes - 2 hours	Opioid	IV or IM	(0.1mg/kg×450kg) ÷10mg/mL =4.5mL	<ul style="list-style-type: none"> ● Not recommended for use in horses for human consumption ● Hepatic impairment ● Increases CSF and intracranial pressure ● Transient diarrhoea
Xylazine	100mg/ml	<u>For standing:</u> 0.2-0.8 mg/kg <u>For recumbent:</u> 1.1mg/kg	15 - 30 minutes	Alpha-2 agonist	IV/ IM	<u>For standing:</u> (0.8mg/kg×450kg) ÷100mg/mL =3.6mL <u>For recumbent:</u> (1.1mg/kg×450kg) ÷100mg/mL =4.95mL	<ul style="list-style-type: none"> ● Not recommended for use in horses for human consumption ● Hypovolemia ● Hypertension ● Cardiac arrhythmias ● bradycardia

Ketamine hydrochloride		1.1-2.0 mg/kg	10-20 minutes	Dissociative anesthetic	IV		<ul style="list-style-type: none"> ● Not recommended for use in horses for human consumption ● Can cause hepatic or renal impairment, tachycardia and hypotension
Thiopental barbiturate		5.5-10 mg/kg	3-14 minutes	Anesthetic	IV		<ul style="list-style-type: none"> ● Not to be used in foals under 2 years old ● Not recommended for use in horses for human consumption ● Causes diminished cardiac output
Diazepam	5mg/ml	0.05-0.44 mg/kg	20 - 25 minutes	Benzodiazepine	IV	(0.44mg/kg×450kg) ÷5mg/mL =39.6mL	<ul style="list-style-type: none"> ● Severe hepatic impairment ● Ataxia ● Panic reactions
Phenylbutazone	Oral: 1000mg/tablet IV: 200mg/ml	2.2 mg/kg	24 hours	NSAID	IV or Oral	I.V. (2.2mg/kg×450kg) ÷200mg/mL =4.95mL	<ul style="list-style-type: none"> ● Ulceration of the mouth and GIT ● Kidney damage ● Close monitoring when given to foals ● No more than 5 successive days of IV therapy
Flunixin	50mg/ml	1.1 mg/kg	Up to 5 days	NSAID	IV, IM	(1.1mg/kg×4	<ul style="list-style-type: none"> ● Ulceration of GIT

Meglumine					or Oral	50kg) ÷50mg/mL =9.95mL	<ul style="list-style-type: none"> • Kidney damage • Pain and swelling at site of injection
Benzathine Penicillin	300,000 IU/ml	20,000 IU/kg	Up to 7 days	Antibiotic	IM, IV	(22000 I.U)/kg×450kg)÷300000 I.U/mL= 33mL	<ul style="list-style-type: none"> • Should not be given to horses with an allergic reaction to it
Ceftiofur	50mg/ml	2.2 mg/kg	Up to 3 days	Antibiotic	IM	(2.2mg/kg×4 50kg) ÷50mg/mL =19.8mL	<ul style="list-style-type: none"> • Pain and swelling at site of injection • Diarrhoea
Tetanus prophylaxis [vaccine/toxoid/antitoxin]	300 units/mL (volume = 1500 units)	1st dose: 1ml 2nd dose: 1ml Annually: 1ml		Vaccine	IM		<ul style="list-style-type: none"> • Adults must receive 2 shots, 3-6 weeks apart if they were never vaccinated. If this is not followed, they will be at risk to contract tetanus after surgery. • A second dose should be administered 4-8 weeks after the first dose

Drug volume formula:

$(\text{dose} \times \text{weight}) \div \text{concentration} = \text{volume}$

***assuming the horse is 450kg**

Sedation of horse in standing castration:

- ❖ Combination preanesthetics that can be used are an alpha -2 agonist mixed with an opioid to provide heavy sedation:
 - Detomidine/Romifidine + Butorphanol
- ❖ This is followed by the application of local anesthetic (2% Lidocaine) into each testicle

General anesthesia for horse in recumbent castration:

- ❖ An IV catheter is used and the drugs administered
- ❖ Combination of IV agents that can be used:
 - 1) Xylazine (Alpha-2 agonist) + Morphine/Benzodiazepine + Ketamine/Thiopental barbiturate bolus (Induction agent)
 - 2) Xylazine (Alpha-2 agonist) + Ketamine +/- Butorphanol and Diazepam
 - 3) Xylazine (Alpha-2 agonist) + Thiopentone +/- Glyceryl Guaiacolate Ether (GGE)

*The alpha-2 agonist Xylazine can be substituted with Detomidine or Romifidine

- ❖ Local anesthetic such as 2% Lidocaine can be given into each testicle
- ❖ Maintenance is achieved by giving top-up doses, gaseous anesthesia or triple drip (Xylazine, Ketamine and Guaifenesin mixture)

References

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