Drugs

Drug	Doses/Calculations	Class of drug	MOA	Effects	Contraindications	Withdrawal times
2% Lidocaine	**Given as an epidural into the lumbosacral juntion** ***Toxic Dose****:* 10mg/kg ***Volume***= D x W / C = 1 x 8.4 / 20 = 0.42 mL lidocaine **½TD = 62.5mL**. It is safe to give up to this volume. Therefore 5 mL per side = **10mL given** 62.5 mL – 10 mL = 52.5 mL **In this procedure we used less 52.5 mL less than half the toxic dose.**	Class-1b antiarrhythmic drug	Lidocaine enters the nerve cells by diffusion through membranes. It works by stopping sodium (Na) ions from passing through the voltage-gated channels of pain receptors in the body, by binding to the Na channels. An amide on lidocaine allows it to act like an amino acid, and interact with the active sites in the Na channel domains, causing a conformational change. When the active site has something else interacting with it, then it cannot transfer the Na ions,	Lidocaine is a moderately long-acting local anaesthetic. It blocks initiation and transmission of nerve impulses at the site of application by stabilizing the neuronal membrane.	Lidocaine is contraindicated in animals with a known hypersensitivity to the drug.	**Epidural:** Meat- 1 day Milk- 24 hours **Infiltration:** Meat- 4 days Milk- 72 hours

			and therefore cannot send signals of pain to the brain.			
10% Ketamine	**<u>IM Sedative:</u>** ***Dose***: 5 mg/Kg ***Weight***: 8.4 Kg ***Conc.***: 100mg/mL ***Vol.*****:** D x W / C =(5 mg/Kg x 8.4 Kg)/ (100mg/mL) = 0.42 mL	N-methyl-D-aspartate (NMDA) antagonist	Ketamine acts as an antagonist for NMDA receptors which are involved in processing CNS input, therefore blocking this input. It also acts on opioid receptors and voltage gated Ca channels which aid in its analgesic effect. The full mechanism of action is not completely understood.	Ketamine is a rapid-acting general anaesthetic. It produces anaesthesia characterised by profound analgesia with normal ocular, pharyngeal and laryngeal reflexes, normal or increased muscle tone, cardiovascular stimulation, a minimal	Contraindicated in hypertensive animals, those at risk of heart failure, those with hepatic or renal insufficiency, head trauma, pre-existing seizure disorders.	Meat: 3 days Milk: 48 hours

				respiratory depression (which can become severe in some cases of IV administration). There may also be hyper-salivation, increased CSF pressure and, during recovery animals may be hyper-responsive and ataxic, so exposure to handling or loud noises should be kept at a minimum during recovery. Co-administration with alpha-2-agonists (such as xylazine used in this lab) or benzodiazepines can control the increased muscle tone.		

2% Xylazine	***Dose***: 0.05 mg/kg ***Weight***: 8.4 kg ***Conc.***: 20 mg/mL ***Volume:*** D x W/ C =(0.05*250)/20 = **0.021 mL**	Potent Alpha 2 adrenergic agonist	Xylazine has a highly lipophilic nature, it directly stimulates central α2 receptors as well as peripheral α-adrenoceptors in a variety of tissues.As an agonist, xylazine leads to a decrease in neurotransmission of norepinephrine and dopamine in the central nervous system. It does so by mimicking norepinephrine in binding to presynaptic surface receptors, which leads to feedback inhibition of norepinephrine. Xylazine also serves as a transport inhibitor by suppressing norepinephrine transport function through competitive	Causes sedation, anaethesia, muscle relaxation and analgesia in many animals. It is 10–20 times more potent in ruminants than other species and is therefore used as a very useful sedative and analgesic in cattle, goats, and sheep.	Induces uterine contractions and therefore should not be used in pregnant cows. Detomidine is regarded as a better alternative. If animal is very excited, anxious or unruly, xylazine may not produce reliable sedation. Side effects in animals include transient hypertension, hypotension, gastrointestinal upset and respiratory depression.	Meat: 4 days Milk: 24 hours

			inhibition of substrate transport.			
Tolazoline	***Conc***: 10% = 100mg/mL ***ED***: 4x xylazine dose 4 x .05 = .2mg/kg ***Vol***: (8.4 kg x .2mg/kg) / 100mg/mL **= .0168 = .02 mL of Tolazoline to be given IV if required**	Alpha 1 and 2 adrenergic competitive antagonist	Reverses the effects of Alpha 2 agonists ,eg. Xylazine, by competitively binding to Alpha 2 adrenergic receptors.	A direct peripheral vasodilator. It has direct actions on blood vessels; decreasing the pulmonary arterial pressure and peripheral resistance, and increasing venous capacity and cardiac output and can cause tachycardia, hypotension, and increased GI motility	It should not be administered to animals exhibiting signs of stress, debilitation, cardiac disease, sympathetic blockage, hypovolemia, or shock	Meat: 8 days Milk: 48 hours
Flunixin	***Conc***.: 5% = 50mg/mL ***Dose***: 1.1mg/kg ***Weight*****:** 250kg ***Vol***.: (250kg x 1.1mg/kg) / 50mg/mL **= 5.5 mL given IV 10 mins post sedative**	Nicotinic acid derivative non steroidal anti-inflammatory (NSAID)	Flunixin meglumine is a non selective COX inhibitor.	It has potent anti-inflammatory and analgesic effects and is indicated for the treatment of acute and surgical pain. Flunixin is an exception among the NSAIDs as it relieves visceral pain and not only	Flunixin is not given rapidly via IV as some anaphylactic reactions have been observed. Treatment for longer than 3 days can result in hematochezia and hematuria.	Meat: 4 days Milk: 72 hours

				integument pain as most NSAIDs do.		
Penicillin	***Conc***.: 200,000 IU/mL ***Dose***: 20,000 IU/kg ***Weight:*** 250kg ***Vol***.: (8.4kg x 10,000 IU/kg) / 200,000 IU/mL = **.42 mL given IM**	Penicillin G (benzylpenicillin) – Natural penicillin	The structure of penicillins includes a β-lactam ring and a thiazolidone ring. Cleavage of the β-lactam ring destroys antibiotic activity. Penicillins bind to and inhibit the transpeptidase involved in the cross-linking of the bacterial cell wall, the third and final step in cell-wall synthesis. The weakened cell wall ruptures, resulting in lysis and cell death. Penicillins also inhibit other peptidases (penicillin-binding proteins) involved in cell wall synthesis and block the inhibition of autolysins. Rapidly	Penicillin G is used in all species for the treatment of infections caused by Gram(+), nonpenicillinase producing pathogens.	Allergic reactions to penicillin may occur in animals	Meat: 10 days Milk: 48 hours

			growing bacteria are most susceptible to the bactericidal effect of penicillin.			
Streptomycin		Aminoglycoside antibiotic	Streptomycin binds to the 30S ribosomal fragment and inhibits the rate of protein synthesis and the fidelity of mRNA translation which results in the synthesis of abnormal proteins. It is bactericidal against Gram(–) aerobes and is synergistic with β-lactams against many Gram(+) pathogens.	Streptomycin is used to treat and prevent Gram(-) infections.	The aminoglycosides are relatively more toxic than other classes of antimicrobials. Hence, dosage regimens must be adjusted in animals with decreased renal function and they should not be used with other ototoxic or nephrotoxic drugs.	Meat: 2 days
Epinephrine	May be administered IV in emergency cases. In such a case, 0.01% (0.1 mg/mL) soln is required. If epinephrine HCl @ 1 mg/mL is the only	Alpha and beta adrenergic agonist	Epinephrine acts on alpha and beta-adrenergic receptors. Through its action on alpha-adrenergic receptors, epinephrine	It's actions on alpha adrenergic receptors reduce loss of intravascular fluid volume and possible risk of hypotension.	IVs administration is not recommended for routine clinical cases. Epinephrine is contraindicated	

	concentration available, dilute 1mL in 9mL normal saline. Dose: 1.5 to 5.0 mL of 0.01% epinephrine HCl per 45Kg body weight (repeat after 15 minutes if necessary. ***Conc.:*** 0.1mg/mL ***Weight:*** 8.4Kg 1.5*(8.4/45) =.28 mL 0.1% Epinephrine		minimizes the vasodilation and inhibits the increased vascular permeability that occurs during anaphylaxis. Through its action on beta-adrenergic receptors, epinephrine leads to bronchial smooth muscle relaxation.	Bronchial smooth muscle relaxation associated with action on beta adrenergic receptors helps to relieve bronchospasms, wheezing, and dyspnea that may occur during anaphylaxis.	in patients with narrow-angle glaucoma, hypersensitivity to epinephrine, non-anaphylactic shock, during general anesthesia with halogenated hydrocarbons or cyclopropane, during labour and in cardiac dilatation or coronary insufficiency. Epinephrine should not be used in cases where vasopressor drugs are contraindicated. It should not be injected with local anaesthetics into small appendages of the body due to risk of necrosis.	

Tetanus Antitoxin	Dose: 1500 units A 5mL vial contains 1500 units.	Systemic passive immunizing agent.	Neutralizes the toxin produced by *Clostridium tetani* before it is transported to the nervous system via the circulation. It can also neutralize toxin locally and prevent its systemic absorption. Thus, antitoxin can be given locally, at the site of toxin production, intravenously (in severe cases), and intramuscularly (in less severe cases)		Risk of anaphylactic reaction	Meat: 21 days

CRI calculations

$$\text{Drips} = \frac{8.4\text{kg} \times 5\text{ml/kg/hr} \times 60\text{ drops/ml}}{60\text{min/hr} \times 60\text{secs/min}}$$

$$= 0.7 \text{ drops}$$

Therefore 1 drop every 2 secs

Xylazine = 0.05mg/kg x 8.4kg

1mg/ml

= .42 ml

To calculate the stock solution; C1 = initial concentration of xylazine, V2 = volume of stock, C2 = final concentration of zylazine
V1(C1) = (V2)C2
V1 x 20mg/ml = 10ml x 1mg/ml
V1 = 0.5 ml Xylazine in stock
Therefore 9.5ml saline + .5ml xylazine = 10ml Stock solution