Note: Doses are for both alpacas and llamas unless differences are specifically stipulated.

There are no licensed medications for camelids, so all are prescribed under the Cascade. Safety and efficacy data are not available. The authors take no responsibility for the accuracy, efficacy or safety of the below, nor for any adverse reactions following administration. Owners should be advised of the above, including any known risks of use and signed off-licence consent obtained. Not all medications listed have MRLs, and their use must be considered with the intended purpose of the animal, as they cannot be 'signed out' of the food chain.

For further information please refer to the full reference list table provided at the end of this resource.

Drug	Trade Name e.g.	Dose	Notes
Albendazole	Valbazen	10mg/kg PO	Narrow Safety Margin. Must dose accurately to BW and never on consecutive days. Repeat in 7 days if needed in severe infection. Ineffective on immature fluke. Dose 6 weeks after a high forecast. Not in cria <6mo (liver failure). Do not use in pregnant females (deformities in cria).
Amoxicillin	Betamox	7mg/kg IM, SC q24h	As cattle. IM preferred.
Amoxicillin clavulanic acid	Synulox	8.75 mg/kg IM q12h	3-5 days
Atropine	Atrocare	0.04mg/kg IV, SC	
Bismuth Subsalicylate	Pepto Bismol	15ml BID cria <4weeks 30-60ml BID 4w-3 mo 60-120ml BID >3mo	More useful in 'preruminant'. Note faecces may turn grey. Efficacy may wane in older animals.
BKX (GA)	GA	Llama: ketamine 4 mg/kg xylazine 0.4mg/kg butorphanol 0.04mg/kg Alpaca ketamine 5mg/kg xylazine 0.5mg/kg butorphanol 0.05mg/kg	Give together IM. Withhold hard feed before induction (6-12h), monitor, good for short procedures. Mind head position to allow drooling and prevent aspiration. Remove water and feed until recovered.
Buserelin	Receptal	1-2ml IM	Stimulates ovulation. Given at mating and 24 h later
Butafosfan/ phosphorus	Vigophos	5mg/kg IM	Can be administered alongside vitamin D therapy for hypovitaminosis D for 1- 3 days.
Butorphanol	Torbugesic	0.05-0.1mg/kg IV 0.1-0.3mg/kg IM	Decent pain relief (IM), appetite stimulant at low dose, good for dystocia.
Butylscopolamine	Buscopan	0.4mg/kg IM, IV, SC	CAUTION: Repeated dosing may lead to ileus. Must be given slowly IV. No information on use in pregnancy, so not advisable.

Drug	Trade Name e.g.	Dose	Notes
Ceftiofur	Excenel / RTU	2.2mg/kg SC q12h	CIA
Cloprostenol	Estrumate	250µg IM	Luteolysis (2 doses, 24h apart). Abortive.
Closantel	Flukiver	10mg/kg	Effective against Haemonchus. Immature fluke.
Decoquinate	Deccox 6%	0.5mg/kg daily	Mixed @ feed mill, use for 4 weeks for prevention.
Dexamethasone	Dexadreson/ject	0.05-0.1mg/kg SC, IM, IV	CAUTION: Single dose. Only use short acting; multidosing damaging to liver and can cause hyperglycaemia in stressed animals. BG should be <10mmol/l prior to use. Abortive; ineffective in inducing parturition but causes foetal stress.
Diclazuril	Vecoxan	1mg/kg PO	Sheep dose for coccidiosis.
Dinoprost tromethamine	Lutalyse	DO NOT USE	Known to cause acute death in high% of recipients.
Doramectin	Dectomax	0.3mg/kg SC	Not effective for Haemonchus. Do not use in mange; long half-life, so repeat dosing leads to accumulation.
Enrofloxacin	Baytril	5mg/kg SC q24h	CIA, use only after C and S
Eprinomectin	Eprinex	0.5mg/kg topically 2-3 times a week for 2-3 weeks.	Mix 1 part with 3 parts oil and apply to mange affected areas directly. Scabs must be lifted with keratolytic shampoo to aid penetration. Ineffective for sarcoptes. Limited evidence whether effective at all and may promote resistance.
Fenbendazole	Panacur	10-20 mg/kg PO	3-5 day course for severe burdens. Higher dose for giardia (50mg/kg). 1 dose may be sufficient in moderate burdens – case by case.
Florfenicol	Nuflor/Norfenicol	20mg/kg IM (SC) q48h	Care with prolonged use, implicated in anaemia/illness. Monitor RBC, WBC, TP. Shorter courses and lower dose suitable for more sensitive organisms. IM preferred.
Flunixin Meglumine	Flunixin	1-2mg/kg q12-24h SC IM IV	Care in dehydration. Suggest rehydrate before use. Not to exceed 2.2mg/kg/day
Furosemide	Lasix	0.5mg/kg IV	

Drug	Trade Name e.g.	Dose	Notes
Gentamicin		5mg/kg q24h IV	Nephrotoxic, max 5 days. IVFT preferred.
Iron Dextran	Gleptosil	300mg alpaca, 500mg llama SC q3 days for 3 treatments	Not in pregnancy.
Ivermectin	Ivomec	0.3mg/kg SC worming 0.6mg/kg SC sarcoptic mange	Pour-on application and oral dosing ineffective against endoparasites.
Kaolin Pectate	Kaolin Gel	0.5-1mg/kg total daily	Can be split in to QID.
Ketamine	Ketamidor	Llama 4mg/kg IM Alpaca 5mg/kg IM 2-5mg/kg IV	
Ketoprofen	Ketofen	1-2mg/kg IV SC IM q24h	
Levamisole	Levacide	6mg/kg SC 8mg/kg PO	Low toxicity threshold.
Mannitol		1g/kg slow IV	Reduction of cerebral oedema (CCN).
Marbofloxacin	Marbocyl	2mg/kg SC IM q24h	CIA, use only after C and S.
Meloxicam	Metacam/Loxicom	0.5mg/kg IV one off 1mg/kg PO 0.5-0.6mg/kg SC	Oral dosing takes 22 hours before Cmax, so begin course with injectable preparation.
Metronidazole		DO NOT USE	Kills off gut flora.
Monepantel	Zolvix	7.5mg/kg PO	Reserve. Only studied in llamas.
Moxidectin	Cydectin	0.4mg/kg PO	Avoid pour on. Oral better. Works on Haemonchus (suggest reserve). Narrow safety margin.
Nitroxynil	Trodax	10mg/kg SC	Use in triclabendazole resistance – not as safe as triclabendazole. Risk pain, fleece damage, abortion and death. Does not affect immature flukes.
Omeprazole		0.4-0.8mg/kg IV	Little point in administering PO if can cud- pantoprazole preferred and has evidence base but no MRL specified.

Drug	Trade Name e.g.	Dose	Notes
ORT			Use human preparations if possible; as some calf preps can have too much Na and Glucose.
Oxytetracycline	Alamycin, Engemycin, Tetroxyvet	10-20mg/kg SC, IV	High dose useful for Mycoplasma haemolamae. Not IM. 3-5 day courses.
Oxytocin	Oxytocin S	5-10iu IM	Can cause colic at higher dose. Use for RFM and milk letdown, not induction.
Pantoprazole	Protium	1mg/kg IV or 2mg/kg SC daily	Lasts for 24h, but no residue.
Penethamate	Mamyzin	30mg/kg IM 4 day course	Clogs in the needle, so prep and inject quickly.
Penicillin		Pen G 22000 iU/kg SC q 12h for 3 days to 3 weeks.	Double if SID.
Praziquantel		50mg/kg PO	
Procaine	Adrenacaine / Willcaine	5-10mg/kg	Do not exceed 10mg/kg. Dilute with water for injection. Toxicity reported.
Propylene Glycol	Propylene Glycol	1ml/kg PO SID	Toxicosis reported in llama. Keep dose low. Max 4 days based on cattle.
Ranitidine	Zantac	1.7mg/kg IV IM SC	BID for treatment, SID for prevention.
Stun Sedation	Low dose BKX	Ketamine 0.33mg/kg Xylazine 0.33mg/kg Butorphanol 0.11mg/kg	Mix and give IV. 10-15 mins minor procedures such as suture, tear duct flush.
Sucralfate	Antepsin	1gram/22.5 kg PO BID -QID	Limited efficacy, binds ulcerated tissue
Tilmicosin	Micotil	DO NOT USE	Can cause acute death. So can tulathromycin.
Toltrazuril	Baycox / Tolracol	15-30mg/kg PO	Better for E.mac than Vecoxan (anecdotal) (which is dosed at 1mg/kg PO if preferred e.g. for cria). INI, repeat 7-14 days later.
Triclabendazole	Fasinex	12mg/kg PO	All stages covered.

Drug	Trade Name e.g.	Dose	Notes
Trimethoprim sulpha	Norodine 24	30mg/kg SC q12h	Care with IV use, has caused acute death
Thiamine/ Vitamin B1	Vitamin B1	15mg/kg SC IM IV q4-24h	Suggest better aggressive at first, then continue lower frequency until 3 days after after resolution.
Vitamin B12	Anivit B12 / VitBee	3mg alpaca 5mg llama	
Vitamin D	Hipravit AD3E Belavit AD3E	1000iu/kg SC (prevention) 2000iu/kg SC (treatment one off)	8 weekly doses over winter months. Overdose leads to ureter/kidney damage. Care with different products, different concentrations. Oral preparations may need more frequent dosing.
Vitamin E		0.05mg/kg SC	Injectable Selenium selenite/selenite i.e. Vitesel can cause acute death. Barium selenite only.
Xylazine	Nerfasin 2%	0.2 mg/kg IV llama, 0.3mg/kg IV alpaca, 0.4mg/kg IM llama, 0.6mg/kg IM alpaca	Usual considerations apply to sedation, watch for ptyalism. Causes bradycardia.

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This document was prepared by Ami Sawran (Westpoint Farm Vets, Chelmsford) of the VetPartners Camelid Clinical Interest Group, with assistance from the VetPartners Farm Animal Clinical Board. This document was prepared based on the contributors' opinion, experience and understanding of the current literature.

For any enquiries about this document please email **Clinical.Board@vetpartners.co.uk** and entitle your email **'Camelid Formulary'**.

This document will be reviewed and updated if necessary, in 12 months' time.

The references used in the production of this document are on the next page.

Drug	Dose	Notes	References
Albendazole	10mg/kg PO	Narrow Safety Margin. Must dose accurately to BW and never on consecutive days. Repeat in 7 days if needed in severe infection. Doesn't get immature fluke. Dose 6 weeks after a high forecast. Not in cria <6mo (liver failure) Do not use in pregnant females (deformities in cria)	Gruntman, A., Nolen-Walston, R., Parry, N., Wilborn, R. and Maxwell, H., 2009. Presumptive albendazole toxicosis in 12 alpacas. Journal of veterinary internal medicine, 23(4), pp.945-949. Ballweber, L.R., 2009. Ecto-and endoparasites of new world camelids. Veterinary Clinics of North America: Food Animal Practice, 25(2), pp.295-310. Galvan, N., Middleton, J.R., Nagy, D.W., Schultz, L.G. and Schaeffer, J.W., 2012. Anthelmintic resistance in a herd of alpacas (Vicugna pacos). The Canadian Veterinary Journal, 53(12), p.1310.
Amoxicillin	7mg/kg IM, SC q24h	As cattle. IM preferred	Cebra, C.K. and Cebra, M.L., 2013. Antimicrobial drug use in new world camelids. Antimicrobial Therapy in Veterinary Medicine, p.541. Kreil, V.E., Ambros, L., Montoya, L., Hallu, R., Rebuelto, M. and Bramuglia, G., 2012. Pharmacokinetics of sodium and trihydrate amoxicillin after intravenous and intramuscular administration in llamas (Lama glama). Small ruminant research, 102(2-3), pp.208-212.
Amoxicillin clavulanic acid	8.75 mg/kg IM q12h	3-5 days	
Atropine	0.04mg/kg IV, SC		Smith, J.A., 1989. Noninfectious diseases, metabolic diseases, toxicities, and neoplastic diseases of South American camelids. Veterinary Clinics of North America: Food Animal Practice, 5(1), pp.101-143.
Bismuth Subsalicylate	15ml BID	15ml BID cria <4weeks 30-60ml BID 4w-3months 60-120ml BID >3mo	Starkey, S.R., Johnson, A.L., Ziegler, P.E. and Mohammed, H.O., 2007. An outbreak of cryptosporidiosis among alpaca crias and their human caregivers. Journal of the American Veterinary Medical Association, 231(10), pp.1562-1567.
BKX (GA)	Llama: ketamine 4 mg/kg xylazine 0.4mg/kg butorphanol Alpaca: ketamine 5mg/kg xylazine 0.5mg/kg butorphanol 0.05mg/kg	Give together IM. Withhold hard feed before induction (6-12h), monitor, good for short procedures. Mind head position to allow drooling and prevent aspiration. Remove water and feed until recovered.	Pereira, F.G., Greene, S.A., McEwen, M.M. and Keegan, R., 2006. Analgesia and anesthesia in camelids. Small Ruminant Research, 61(2-3), pp.227-233.
Butylscopolamine Buscopan	0.4mg/kg IM, IV, SC	CAUTION: Repeated dosing may lead to ileus. Must be given slowly IV. No information on use in pregnancy, so not advisable.	T Tibary, A., Rodriguez, J., & Sandoval, S. (2008). Reproductive emergencies in camelids. Theriogenology, 70(3), 515–534. **https://doi.org/10.1016/j.theriogenology.2008.04.024**

Drug	Dose	Notes	References
Buserelin	1-2ml IM	Stimulates ovulation	Trasorras, V., Giuliano, S. and Miragaya, M., 2013. In vitro production of embryos in South American camelids. Animal reproduction science, 136(3), pp.187-193. Skidmore, J.A., 2011. Reproductive physiology in female old world camelids. Animal reproduction science, 124(3-4), pp.148-154. Brown, B.W., 2000. A review on reproduction in South American camelids. Animal reproduction science, 58(3-4), pp.169-195.
Butafosfan/ phosphorus	5mg/kg IM	Can be administered alongside vitamin D therapy for hypovitaminosis D for 1- 3 days.	
Butorphanol	0.05-0.1mg/kg IV 0.1-0.3mg/kg IM	Decent pain relief, appetite stimulant at low dose, good for dystocia	Carroll, G.L., Boothe, D.M., Hartsfield, S.M., Martinez, E.A., Spann, A.C. and Hernandez, A., 2001. Pharmacokinetics and pharmacodynamics of butorphanol in llamas after intravenous and intramuscular administration. Journal of the American Veterinary Medical Association, 219(9), pp.1263-1268. Abrahamsen EJ: Chemical restraint, anesthesia and analgesia for camelids, Vet Clin North Am: Food Anim Pract 25(2):455-494, 2009. Miesner MD: Field anesthesia techniques in camelids. In Proceedings of the 81st Western Veterinary Conference, Las Vegas, NV, 2009 (p V557).
Ceftiofur	2.2mg/kg SC q12h	CIA	Drew, M.L., Johnson, L., Pugh, D., Navarre, C.B., Taylor, I.T. and Craigmill, A.L., 2004. Pharmacokinetics of ceftiofur in llamas and alpacas. Journal of veterinary pharmacology and therapeutics, 27(1), pp.13-20. Dechant, J.E., Rowe, J.D., Byrne, B.A., Wetzlich, S.E., Kieu, H.T. and Tell, L.A., 2013. Pharmacokinetics of ceftiofur crystalline free acid after single and multiple subcutaneous administrations in healthy alpacas (Vicugna pacos). Journal of veterinary pharmacology and therapeutics, 36(2), pp.122-129.
Cloprostenol	250g IM	Luteolysis (2 doses, 24h apart). Abortive.	Smith, B.B., Timm, K.I., Reed, P.J. and Christensen, M., 2000. Use of cloprostenol as an abortifacient in the llama (Lama glama). Theriogenology, 54(3), pp.497-505.
Closantel	10mg/kg	Effective against Haemonchus. Covers immature fluke.	Franz, S., Wittek, T., Joachim, A., Hinney, B. and Dadak, A.M., 2015. Llamas and alpacas in Europe: Endoparasites of the digestive tract and their pharmacotherapeutic control. The Veterinary Journal, 204(3), pp.255-262.
Decoquinate	0.5mg/kg daily	Mixed @ feed mill, use for 4 weeks. Prevention dose. Treatment is 1mg/kg.	Ballweber, L.R., 2009. Ecto-and endoparasites of new world camelids. Veterinary Clinics of North America: Food Animal Practice, 25(2), pp.295-310.

Drug	Dose	Notes	References
Dexamethasone	0.05-0.1mg/kg SC, IM, IV	CAUTION: Single dose. Only use short acting; multidosing damaging to liver and can cause hyperglycaemia in stressed animals. BG should be <10mmol/l prior to use. Abortive; ineffective in inducing parturition, but causes foetal stress.	Cebra, C.K., 2009. Disorders of carbohydrate or lipid metabolism in camelids. Veterinary Clinics: Food Animal Practice, 25(2), pp.339-352. D'Alterio, G.L., 2006. Introduction to the alpaca and its veterinary care in the UK. In practice, 28(7), pp.404-411. Firshman, A.M., Cebra, C.K., Schanbacher, B.J. and Seaquist, E.R., 2013. Evaluation of insulin secretion and action in New World camelids. American journal of veterinary research, 74(1), pp.96-101. Bravo, P.W., Bazan, P.J., Troedsson, M.H., Villalta, P.R. and Garnica, J.P., 1996. Induction of parturition in alpacas and subsequent survival of neonates. Journal of the American Veterinary Medical Association, 209(10), pp.1760-1762.
Diclazuril	1mg/kg PO	Sheep dose for coccidiosis	
Dinoprost tromethamine	DO NOT USE	Known to cause acute death in high% of recipients.	Smith, B.B., Timm, K.I., Reed, P.J. and Christensen, M., 2000. Use of cloprostenol as an abortifacient in the llama (Lama glama). Theriogenology, 54(3), pp.497-505.
Doramectin	0.3mg/kg SC	Not effective for Haemonchus. Do not use in mange; long half-life, so repeat dosing leads to accumulation.	Galvan, N., Middleton, J.R., Nagy, D.W., Schultz, L.G. and Schaeffer, J.W., 2012. Anthelmintic resistance in a herd of alpacas (Vicugna pacos). The Canadian Veterinary Journal, 53(12), p.1310. Sarre, C., Claerebout, E., Vercruysse, J., Levecke, B., Geldhof, P., Pardon, B., Alvinerie, M., Sutra, J.F. and Geurden, T., 2012. Doramectin resistance in Haemonchus contortus on an alpaca farm in Belgium. Veterinary parasitology, 185(2-4), pp.346-351. Hunter, R.P., Isaza, R., Koch, D.E., Dodd, C.C. and Goatley, M.A., 2004. The pharmacokinetics of topical doramectin in llamas (Lama glama) and alpacas (Lama pacos). Journal of veterinary pharmacology and therapeutics, 27(3), pp.187-189. Rohbeck, S., 2006. Parasite infections of the digestive and respiratory systemms of South American camelids: Investigations on their epidemiology and control measures in a herd in sourthern Hessen, Germany and the biology of Eimeria macusaniensis. Giessen. Germany and the biology of Eimeria macusaniensis. Lye, G., Jacob, A., Pomroy, W., Stafford, K. and Singh, P., 2019. Pharmacokinetics of subcutaneously administered doramectin in alpacas. Journal of veterinary pharmacology and therapeutics.

Drug	Dose	Notes	References
Enrofloxacin	5mg/kg SC q24h	NOT first line. C/S only.	Gandolf, A.R., Papich, M.G., Bringardner, A.B. and Atkinson, M.W., 2005. Pharmacokinetics after intravenous, subcutaneous, and oral administration of enrofloxacin to alpacas. American journal of veterinary research, 66(5), pp.767-771.
Eprinomectin	0.5mg/kg topically 2-3 times a week for 2-3 weeks.	Mix 1 part with 3 parts oil and apply to mange affected areas directly. Scabs must be lifted with keratolytic shampoo to aid penetration. Ineffective for sarcoptes. Limited evidence whether effective at all and may promote resistance.	Franz, S., Wittek, T., Joachim, A., Hinney, B. and Dadak, A.M., 2015. Llamas and alpacas in Europe: Endoparasites of the digestive tract and their pharmacotherapeutic control. The Veterinary Journal, 204(3), pp.255-262. Pollock, J., Bedenice, D., Jennings, S.H. and Papich, M.G., 2017. Pharmacokinetics of an extended-release formulation of eprinomectin in healthy adult alpacas and its use in alpacas confirmed with mange. Journal of veterinary pharmacology and therapeutics, 40(2), pp.192-199.
Fenbendazole	10-20 mg/kg PO	3-5 day course for severe burdens. Higher dose for giardia (50mg/kg). 1 dose may be sufficient in moderate burdens – case by case.	Gillespie, R.A.M., Williamson, L.H., Terrill, T.H. and Kaplan, R.M., 2010. Efficacy of anthelmintics on South American camelid (llama and alpaca) farms in Georgia. Veterinary parasitology, 172(1-2), pp.168-171. Beier III, E., Lehenbauer, T.W. and Sangiah, S., 2000. Clinical efficacy of fenbendazole against gastrointestinal parasites in llamas. Small Ruminant Research, 36(1), pp.17-23. Ballweber, L.R., 2009. Ecto-and endoparasites of new world camelids. Veterinary Clinics of North America: Food Animal Practice, 25(2), pp.295-310.
Florfenicol	20mg/kg IM (SC) q48h	Care with prolonged use, implicated in anaemia/illness. Monitor RBC, WBC, TP. Shorter courses and lower dose suitable for more sensitive organisms. IM preferred.	Gandolf, A.R., Papich, M.G., Bringardner, A.B. and Atkinson, M.W., 2005. Pharmacokinetics after intravenous, subcutaneous, and oral administration of enrofloxacin to alpacas. American journal of veterinary research, 66(5), pp.767-771. Pentecost, R.L., Niehaus, A.J., Werle, N.A. and Lakritz, J., 2013. Pharmacokinetics of florfenicol after intravenous and intramuscular dosing in llamas. Research in veterinary science, 95(2), pp.594-599.
Flunixin Meglumine	1-2mg/kg q12-24h SC IM IV	Care in dehydration. Suggest rehydrate before use. Not to exceed 2.2mg/kg/day	Reppert, E.J., Kleinhenz, M.D., Montgomery, S.R., Heiman, J., Sura, A., Bornheim, H.N., Magnin, G., Sidhu, P.K., Zhang, Y., Joo, H. and Coetzee, J.F., 2019. Pharmacokinetics and pharmacodynamics of intravenous and transdermal flunixin meglumine in alpacas. Journal of veterinary pharmacology and therapeutics, 42(5), pp.572-579.

Drug	Dose	Notes	References
Furosemide	0.5mg/kg IV		Kozikowski, T.A., Magdesian, K.G. and Puschner, B., 2009. Oleander intoxication in New World camelids: 12 cases (1995–2006). Journal of the American Veterinary Medical Association, 235(3), pp.305-310. Margiocco, M.L., Scansen, B.A. and Bonagura, J.D., 2009. Camelid cardiology. Veterinary Clinics: Food Animal Practice, 25(2), pp.423-454. Tibary, A., Rodriguez, J. and Sandoval, S., 2008. Reproductive emergencies in camelids. Theriogenology, 70(3), pp.515-534. McKenzie, E.C., Diagnosis & Management of Diseases of Neonatal & Juvenile Camelids ACVIM 2008.
Gentamicin	5mg/kg q24h IV	Nephrotoxic, max 5 days. IVFT preferred.	Kasiwong, S., 1997. Pharmacokinetics of ampicillin, gentamicin, amikacin, and omeprazole in llamas. Lackey, M.N., Belknap, E.B., Greco, D.S. and Fettman, M.J., 1996. Single intravenous and multiple dose pharmacokinetics of gentamicin in healthy llamas. American journal of veterinary research, 57(8), pp.1193-1199.
Iron Dextran	300mg alpaca, 500mg llama SC q3 days for 3 treatments		Van Saun, R.J., 2006. Nutritional diseases of South American camelids. Small Ruminant Research, 61(2-3), pp.153-164. Duncanson, G.R., 2012. Veterinary treatment of llamas and alpacas. CaBi. Morin , D.E. , Garry , F.B. , Weiser , M.G. , Fettman , M.J. , and Johnson , L.W. 1992 . Hematologic features of iron defi ciency anemia in llamas . Vet. Path. 29 (5): 400 – 404 .
Ivermectin	0.3mg/kg SC worming 0.6mg/kg SC sarcoptic mange	Pour-on application and oral dosing ineffective against endoparasites.	Jarvinen, J.A., Miller, J.A. and Oehler, D.D., 2002. Pharmacokinetics of ivermectin in llamas (Lama glama). Veterinary record, 150(11), pp.344-346. Burkholder, T.H., Jensen, J., Chen, H., Junkins, K., Chatfield, J. and Boothe, D., 2004. Plasma evaluation for ivermectin in llamas (Lama glama) after standard subcutaneous dosing. Journal of Zoo and Wildlife Medicine, 35(3), pp.395-396. Burkholder, T.H., Jensen, J., Chen, H., Junkins, K., Chatfield, J. and Boothe, D., 2004. Plasma evaluation for ivermectin in llamas (Lama glama) after standard subcutaneous dosing. Journal of Zoo and Wildlife Medicine, 35(3), pp.395-396. Gillespie, R.A.M., Williamson, L.H., Terrill, T.H. and Kaplan, R.M., 2010. Efficacy of anthelmintics on South American camelid (llama and alpaca) farms in Georgia. Veterinary parasitology, 172(1-2), pp.168-171. Franz, S., Wittek, T., Joachim, A., Hinney, B. and Dadak, A.M., 2015. Llamas and alpacas in Europe: Endoparasites of the digestive tract and their pharmacotherapeutic control. The Veterinary Journal, 204(3), pp.255-262. Franz, S., Wittek, T., Joachim, A., Hinney, B. and Dadak, A.M., 2015. Llamas and alpacas in Europe: Endoparasites of the digestive tract and their pharmacotherapeutic control. The Veterinary Journal, 204(3), pp.255-262.

Drug	Dose	Notes	References
Kaolin Pectate	0.5-1mg/kg total daily	Can be split in to QID	
Ketamine	Llama 4mg/kg IM Alpaca 5mg/kg IM 2-5mg/kg IV		Prado, T.M., DuBois, W.R., Ko, J.C., Mandsager, R.E. and Morgan, G.L., 2008. A comparison of two combinations of xylazine–ketamine administered intramuscularly to alpacas and of reversal with tolazoline. Veterinary anaesthesia and analgesia, 35(3), pp.201-207.
Ketoprofen	1-2mg/kg IV SC IM q24h		D'Alterio, G.L., 2006. Introduction to the alpaca and its veterinary care in the UK. In practice, 28(7), pp.404-411.
Levamisole	6mg/kg SC 8mg/kg PO	Low toxicity threshold	Guerrero, C.A., Rojas, M. and Alva, J., 1981. Lamanema chavezi, an enterohepatic nematode of South American Camelidae and its control using levamisole. Revista latinoamericana de microbiologia, 23(2), p.121. Gillespie, R.A.M., Williamson, L.H., Terrill, T.H. and Kaplan, R.M., 2010. Efficacy of anthelmintics on South American camelid (llama and alpaca) farms in Georgia. Veterinary parasitology, 172(1-2), pp.168-171. Ballweber, L.R., 2009. Ecto-and endoparasites of new world camelids. Veterinary Clinics of North America: Food Animal Practice, 25(2), pp.295-310. Ballweber, L.R., 2009. Ecto-and endoparasites of new world camelids. Veterinary Clinics of North America: Food Animal Practice, 25(2), pp.295-310.
Mannitol	1g/kg slow IV	Reduction of cerebral oedema (CCN)	Whitehead, C.E. and Bedenice, D., 2009. Neurologic diseases in llamas and alpacas. Veterinary Clinics of North America: Food Animal Practice, 25(2), pp.385-405.
Marbofloxacin	2mg/kg SC IM q24h	Not a first line drug, C/S only	Lachguer, M.A., Mokhtari, A., Obelahcen, R., Attifi, I., Laurentie, M. and El Hraiki, A., 2013. Pharmacokinetic disposition of marbofloxacin and danofloxacin in camel (Camelus dromedarius). Journal of Camel Practice and Research, 20(2), pp.245-250.
Meloxicam	0.5mg/kg IV one off 1mg/kg PO 0.5-0.6mg/kg SC	Oral dosing takes 22 hours before Cmax, so begin course with injectable preparation.	Kreuder, A.J., Coetzee, J.F., Wulf, L.W., Schleining, J.A., KuKanich, B., Layman, L.L. and Plummer, P.J., 2012. Bioavailability and pharmacokinetics of oral meloxicam in llamas. BMC veterinary research, 8(1), p.85.

Drug	Dose	Notes	References
Metronidazole	DO NOT USE	Kills off gut flora	
Monepantel	7.5mg/kg PO	Reserve. Only studied in llamas	Dadak, A.M., Asanger, H., Tichy, A. and Franz, S., 2013. Establishing an efficacious dose rate of monepantel for treating gastrointestinal nematodes in llamas under field conditions. Veterinary Record, 172(6), pp.155-155.
Moxidectin	0.4mg/kg PO	Avoid pour on. Oral better. Works on Haemonchus (suggest reserve). Narrow safety margin.	Franz, S., Wittek, T., Joachim, A., Hinney, B. and Dadak, A.M., 2015. Llamas and alpacas in Europe: Endoparasites of the digestive tract and their pharmacotherapeutic control. The Veterinary Journal, 204(3), pp.255-262. Cocquyt, C.M., Van Amstel, S., Cox, S., Rohrbach, B. and Martín-Jiménez, T., 2016. Pharmacokinetics of moxidectin in alpacas following administration of an oral or subcutaneous formulation. Research in veterinary science, 105, pp.160-164. Hunter, R.P., Isaza, R., Koch, D.E., Dodd, C.C. and Goately, M.A., 2004. Moxidectin plasma concentrations following topical administration to llamas (Lama glama) and alpacas (Lama pacos). Small ruminant research, 52(3), pp.275-279.
Nitroxynil	10mg/kg SC	Use in triclabendazole resistance – not as safe as triclabendazole. Risk pain, fleece damage, abortion and death. Does not affect immature flukes.	No pk data : Duncanson, G.R., 2012. Veterinary treatment of llamas and alpacas. CABI.
Omeprazole	0.4-0.8mg/kg IV	Little point in administering PO if can cud- pantoprazole preferred and has evidence base but no MRL specified.	Poulsen, K.P., Smith, G.W., Davis, J.L. and Papich, M.G., 2005. Pharmacokinetics of oral omeprazole in llamas. Journal of veterinary pharmacology and therapeutics, 28(6), pp.539-543. Drew ML, Ramsay E, Fowler ME, et al. Effect of flunixinmeglumine and cimetidine hydrochloride on the pH in the thirdcompartment of the stomach of llamas. J Am Vet Med Assoc1992;201:1559–1563
ORT		Use human preparations if possible; calf preps can have too much Na and Glucose.	
Oxytetracycline	10-20mg/kg SC, IV	High dose useful for Mycoplasma haemolamae - max 3 days. Nephrotoxicity possible. Injection site reactions reported. 3-5 day courses.	Wattananat, T., Christensen, J.M. and Smith, B.B., 2003. Pharmacokinetics of oxytetracycline in alpacas after intravenous and long-acting intramuscular administration. Pharmacokinetic Analysis of Antimicrobials and an Anthelmintic Agent in Alpacas and Llamas with Theoretical Applications., p.3.

Drug	Dose	Notes	References
Oxytocin	5-10iu IM	Can cause colic at higher dose. Use for RFM and milk letdown, not induction.	Bravo, P.W., Bazan, P.J., Troedsson, M.H., Villalta, P.R. and Garnica, J.P., 1996. Induction of parturition in alpacas and subsequent survival of neonates. Journal of the American Veterinary Medical Association, 209(10), pp.1760-1762.
Pantoprazole	1mg/kg IV or 2mg/kg SC daily	Lasts for 24h, but no residue.	Smith, G.W., Davis, J.L., Smith, S.M., Gerard, M.P., Campbell, N.B. and Foster, D.M., 2010. Efficacy and pharmacokinetics of pantoprazole in alpacas. Journal of veterinary internal medicine, 24(4), pp.949-955.
Penethamate	30mg/kg IM 4 day course	Clogs in the needle, so prep and inject quickly.	
Penicillin	Pen G 22000 iU/kg SC q 12h for 3 days to 3 weeks.	Double dose if SID.	D'Alterio, G.L., 2006. Introduction to the alpaca and its veterinary care in the UK. In practice, 28(7), pp.404-411.
Praziquantel	50mg/kg PO	For small liver fluke.	Wenker, C., Hatt, J.M., Hertzberg, H., Ossent, P., Hänichen, T., Brack, A. and Isenbügel, E., 1998. Dikrozöliose bei Neuweltkameliden. Tierärztl Prax, 26, pp.355-361. Dadak, A.M., Wieser, C., Joachim, A. and Franz, S., 2013. Efficacy and safety of oral praziquantel against Dicrocoelium dendriticum in llamas. Veterinary parasitology, 197(1-2), pp.122-125.
Procaine	5-10mg/kg	Do not exceed 10mg/kg.	Pereira, F.G., Greene, S.A., McEwen, M.M. and Keegan, R., 2006. Analgesia and anesthesia in camelids. Small Ruminant Research, 61(2-3), pp.227-233. Plummer, P.J. and Schleining, J.A., 2013. Assessment and management of pain in small ruminants and camelids. Veterinary Clinics: Food Animal Practice, 29(1), pp.185-208. Alex Dugdale 'Veterinary anaesthesia: principles to practice.'
Propylene Glycol	1ml/kg PO SID	Toxicosis reported in llama. Keep dose low. Max 4 days based on cattle/horses.	Ivany, J.M. and Anderson, D.E., 2001. Propylene glycol toxicosis in a llama. Journal of the American Veterinary Medical Association, 218(2), pp.243-244.
Ranitidine	1.7mg/kg IV IM SC	BID for treatment, SID for prevention. Dilute with water for injection (20 ml per vial).	Christensen, J.M., Limsakun, T., Smith, B.B., Hollingshead, N. and Huber, M., 2001. Pharmacokinetics and pharmacodynamics of antiulcer agents in llama. Journal of veterinary pharmacology and therapeutics, 24(1), pp.23-33.
Stun Sedation	Ketamine 0.33mg/kg Xylazine 0.33mg/kg Butorphanol 0.11mg/kg	Mix and give IV. 10-15 mins minor procedures such as suture, tear duct flush.	

Drug	Dose	Notes	References
Sucralfate	1gram/22.5 kg PO BID -QID	Limited efficacy, binds ulcerated tissue	
Thiamine/ Vitamin B1	15mg/kg SC IM IV q4-24h	Suggest better aggressive at first, then continue at lower frequency until 3 days after resolution.	Himsworth, C.G., 2008. Polioencephalomalacia in a llama. The Canadian Veterinary Journal, 49(6), p.598.
Tilmicosin	DO NOT USE	Can cause acute death. So can tulathromycin.	
Toltrazuril	15-30mg/kg PO	Better for E.mac than Vecoxan (anecdotal) (which is dosed at 1mg/kg PO if preferred e.g. for cria). INI, repeat 7-14 days later.	Prado, M.E., Ryman, J.T., Boileau, M.J., Martin-Jimenez, T. and Meibohm, B., 2011. Pharmacokinetics of ponazuril after oral administration to healthy llamas (Lama glama). American journal of veterinary research, 72(10), pp.1386-1389. Thomas, S.M. and Morgan, E.R., 2013. Effect on performance of weanling alpacas following treatments against gastro-intestinal parasites. Veterinary parasitology, 198(1-2), pp.244-249. Ballweber, L.R., 2009. Ecto-and endoparasites of new world camelids. Veterinary Clinics of North America: Food Animal Practice, 25(2), pp.295-310. Sánchez-Herencia, D., Mamani-Mango, G., & Coila-Añasco, P. (2021). Eimeria control in baby alpacas using toltrazuril as a prophylactic measure in hu-mid Puna. Journal of the Selva Andina Animal Science, 8(2), 82-89.
Triclabendazole	12mg/kg PO	All stages covered.	Puente, G.L., 1997. Acute and subacute fasciolosis of alpacas (Lama pacos) and treatment with triclabendazole. Tropical animal health and production, 29(1), pp.31-32. Ballweber, L.R., 2009. Ecto-and endoparasites of new world camelids. Veterinary Clinics of North America: Food Animal Practice, 25(2), pp.295-310.
Trimethoprim sulpha	30mg/kg SC q12h	Care with IV use, has caused acute death	Chakwenya, J., Lakritz, J., Tyler, J., Fales, W.H., James-Kracke, M., Smith, K. and Holle, J., 2002. Pharmacokinetics and bioavailability of trimethoprim-sulfamethoxazole in alpacas. Journal of veterinary
Vitamin B12	3mg alpaca 5mg llama		Walker, Ohio Formulary.
Vitamin D	1000iu/kg SC (prevention) 2000iu/kg SC (treatment one off)	8 weekly doses over winter months. Overdose leads to ureter/kidney damage. Care with different products, different concentrations. Oral preparations may need more frequent dosing.	Whitehead, C.E., 2005. The Effect of Maternal Supplementation of Vitamin D on Transplacental and Transmammary Transfer to Neonatal Llamas and Alpacas (Doctoral dissertation, Ohio State University).
Vitamin E	0.05mg/kg SC	Injectable Selenium selenite/selenite i.e. Vitasel can cause acute death. Barium selenite only.	Waldridge, B.M., Duran, S.H., Ravis, P.W.R., Paxton, R., Herdt, P.T.H., Pugh, D.G. and DACT, D., 2004. Pharmacokinetics of subcutaneous selenium in adult llamas. Vet Ther, 5(4), pp.272-278.
Xylazine	0.2 mg/kg IV llama, 0.3mg/kg IV alpaca, 0.4mg/kg IM llama, 0.6mg/kg IM alpaca	Usual considerations apply to sedation, watch for ptyalism. Causes bradycardia.	Pereira, F.G., Greene, S.A., McEwen, M.M. and Keegan, R., 2006. Analgesia and anesthesia in camelids. Small Ruminant Research, 61(2-3), pp.227-233. Lin, H. and Walz, P. eds., 2014. Farm animal anesthesia: cattle, small ruminants, camelids, and pigs. John Wiley & Sons.