Appendix 1: Canine osteoarthritis treatment modalities and management approaches evaluated by the COAST Development Group during development of the treatment guidelines

Non-drug / non-surgical	Pet caregiver education	
	Body weight optimization	
	Appropriate exercise	
	Nutrition/dietary	
	Environmental modifications	
	Mobility Assistance Devices	
	Rehabilitation/ Physical therapy/	Manual Therapy: Examples: Cryotherapy/Thermotherapy, Massage, Myofascial release, Range of motion (passive and assisted), Traction
		Movement & exercise: Hydrotherapy, Proprioceptive Exercise, Therapeutic Exercise, Treadmill
		Machinery or Instrument applied: (Electro)Acupuncture, Electrical Nerve Stimulation, Extracorporeal Shockwave therapy, Photobiomodulation, Pulsed electromagnetic field therapy, Ultrasound
	Oral Supplements	Omega-3 EFA
		Chondroitin sulphate
		Glucosamine
		ASU
		Green lipped mussel
		Undenatured Type II collagen (UCII)
		Cannabinoid (CBD) supplements
Oral drugs	NSAIDs	COX inhibitors
		Piprants
	Corticosteroids	
	Amantadine	Adjunct analgesics
	Gabapentin	
	Acetominophen	
	Opioids	
	Tramadol	
Injectable drugs/ biologics	Anti-NGFmAb (Added to evaluation list post initial meeting)	Subcutaneous
	Pentosan polysulphate	I.M.

	Polysulphated glycosaminoglycan	I.M.
	Botulinum toxin	I.A.
	Corticosteroids	I.A.
	Hyaluronic Acid (low molecular weight)	I.A.
	Hyaluronic Acid (high molecular weight)	I.A.
	Platelet Rich Plasma	I.A.
	Stem cells	I.A.
	Opioids	I.M.
	Opioids	I.V. CRI
	Ketamine	I.V. infusions
	Lidocaine	I.V. infusions
Surgery	Preventive	
	Improve quality of life	

Appendix 2: Factors for consideration when selecting an NSAID or a canine anti-NGF mAb for dogs with osteoarthritis.

The availability, in certain geographies, of two different major classes of therapeutic (NSAIDs and the anti-NGF mAb) to control pain in dogs with clinical signs of OA is a relatively recent change in veterinary medicine. The differing modes of action and contrasting product attributes usefully expand the clinician's therapeutic toolbox, but the advantage of choice can also lead to uncertainty about when and how to incorporate each option most effectively into canine OA management protocols. Both classes are considered first-line options for the management of OA-associated pain and disability. Based on current registration state and available efficacy data, it is impossible, and inappropriate, to recommend one approach above the other. The efficacy study outcomes for NSAIDs and the anti-NGF mAb in dogs are very similar, and the treatments were evaluated in comparable populations of dogs. [1] [2] [3] [4] [5] [6] [7] [8] [9] That said, the COAST group members considered both to be appropriate first-line options for COAST stage 3 and 4 dogs, but for COAST stage 2 dogs, 3 of the COAST members indicated they would consider NSAIDs first in these dogs, while 6 COAST members indicated they would consider either an NSAID or anti-NGF as appropriate first-line options for COAST stage 2 dogs.

The potential benefit of concurrent use of these two therapeutic approaches is of veterinary interest. A two-week duration laboratory study evaluating the safety of concomitant administration of the canine anti-NGF mAb and an NSAID to healthy dogs without OA [10] reported no adverse events, including in joint pathology. This provides useful risk: benefit information for dogs requiring short-term administration of both products, but it is currently unknown if an NSAID and the anti NGF mAb can be used safely together for the long-term management of dogs with OA. Product development generally focuses on generating evidence of a benefit of use of the product when used alone. In phase 3 clinical studies for human medicine (human anti-NGF mAbs), the long-term combined use of an human anti-NGF mAb with an NSAID increased the risk of developing rapidly progressive osteoarthritis (RPOA) relative to the use of the human anti-NGF mAb alone. [11] Rapidly progressive osteoarthritis (RPOA) has not been described or recognized in dogs to date.

With the first anti-NGF mAb therapy being only recently approved, and relatively limited published reports on efficacy and safety of anti-NGF mAb therapy in general [10] [9] [12] [13], there is still a lot to be understood about this therapeutic approach in dogs and how to make treatment decisions regarding NSAIDs and anti-NGF therapies within OA management protocols. Until more data is available, the COAST Development Group believes that treatment choice should be guided by careful consideration of the following:
- Key pathophysiological processes that need to be controlled
- Product mode of action
- Product safety profiles
- Patient factors and requirements
- Product attributes

- Pet caregiver needs and preferences

For example, pain control is likely to be the primary consideration in all dogs with clinical signs of OA pain (COASTeR stages 2 to 4), supporting the use of either an NSAID or the anti-NGF mAb due to their demonstrated effectiveness for that purpose. Mode of action considerations may influence product choice, but currently there is no easy way to determine what pathological or neurobiological processes are driving pain in an individual patient. Inflammation may be a more significant contributor to OA pain in the earlier stages of the disease, whereas ongoing sensitization processes are thought to drive heightened levels of pain in more severely affected dogs. [14] Factors such as flexibility in dosing, complex medical comorbidities, convenience and compliance are all important drivers of product choice in dogs with OA-associated pain.

Safety considerations are important and each class tends to have its own safety profile characteristics. Package inserts detail safety data and product information in line with local approvals, and provide guidance on dosing, minimum age and weight recommendations and other considerations including co-morbidities and concurrent medications. Local approval guidelines should be followed for all products.

There are multiple needs for each patient, and it may be difficult to address all requirements. This places the emphasis on the veterinarian to identify the predominant requirements for that patient and select the treatment option that most closely addresses those prioritized needs.

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