BY VETOQUINOL

XPERTISE

IN OSTEOARTHRITIS MANAGEMENT

XPERTISE SCIENTIFIC COMMITTEE RECOMMENDATIONS

On Canine Osteoarthritis Management

vetoquinol

ACHIEVE MORE TOGETHER

Chairman's introduction

"

Canine and feline osteoarthritis (OA) is becoming an increasingly common pathology. With a constant aim to improve the quality of life of our small companions, Vetoquinol, recognising a great need for information and sharing knowledge in this area, has supported the development of a new information and education programme on this disease: the Xpertise programme.

Built by a Scientific Committee of international experts, the Xpertise programme aims to share innovative information and practical experiences through effective and adapted tools for all actors. In order to constantly improve management of the disease, the contents are supplemented and updated annually.

As Chairman of this Scientific Committee, I, on behalf of the whole team, have the pleasure of presenting you this collection of educational brochures containing our advice and opinions through key messages and formalised consensual recommendations for good and effective care. This first issue focuses on 5 subjects that we esteem are essential for the proper management of canine OA.

We hope that this document will provide you with useful tips for your management of OA and that you will enjoy reading it.

Yours sincerely,

Professor Francesco Staffieri,
Xpertise Programme Chairman

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SUMMARY

1 Canine Osteoarthritis Diagnosis

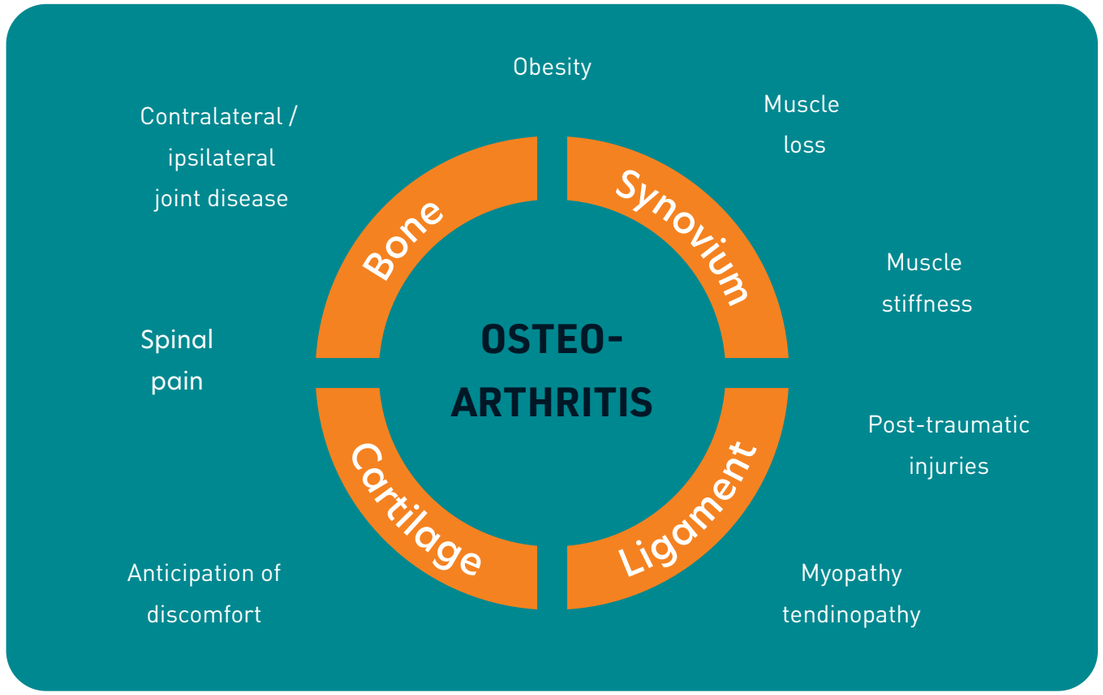
Dr. Grzegorz Wąsiatycz

Dr. Kinley Smith

Osteoarthritis (OA) is a painful, progressive disease that affects at least 20% of dogs[1].
It typically develops secondary to other joint diseases, such as trauma or instability.

Although it is **more likely to be present in older dogs**, it can affect dogs of **any age**.
Progression of OA is unpredictable and may be affected by other diseases, such as obesity.[2,3]

OA affects all joint tissues. This results in a wide spectrum of clinical presentations that vary as the disease progresses. Furthermore, concurrent musculoskeletal problems are common and can both contribute to the clinical presentation, thus confusing the diagnosis (diagram).
Early diagnosis provides the best opportunity to manage OA and its comorbidities.



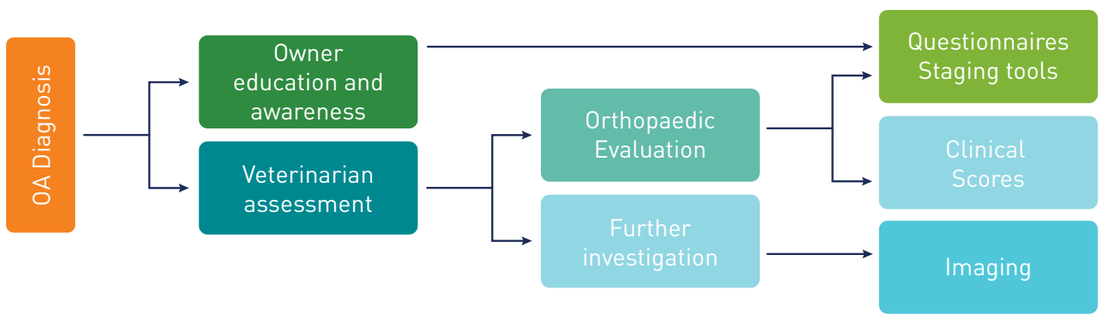
> Clinical OA can be **obscured by concomitant diseases !**

1 Canine Osteoarthritis Diagnosis

OA is diagnosed in two stages :

1. The owner recognises their dog might have signs of OA.
2. The vet examines and assesses the dog.

Key to this is educating owners on the possible clinical signs of osteoarthritis and its comorbidities with an end goal of seeking a veterinary assessment.



Owner education and awareness

A major challenge is that OA is often at an advanced clinical stage when the dog is first brought to the vet. Early presentation offers the best opportunity to diagnose and manage OA and its comorbidities.

Educating the owner on the early signs of OA is important.

- **Stiffness after exercise or rest**
- **Reluctance to climb stairs or jump**
- **Behavioural changes, such as aggression or lethargy**
- **Reluctance to exercise, slowing on walks**

We recommend basic orthopaedic examinations at routine veterinary visits. As clinical signs may be intermittent in the early stages, owners should be encouraged to **film their dogs whenever they have concerns.** This can help resolve confusion over the location of discomfort that might arise during the consultation.

> **Early diagnosis** depends on **early owner education !**

1 Canine Osteoarthritis Diagnosis

Orthopaedic evaluation

A detailed orthopaedic evaluation is required to identify all joints that might be affected by osteoarthritis.

Clues to the location of disease may be in the patient's history, assessment of posture and visual gait analysis. Before a detailed manipulation is undertaken, surface palpation can provide useful information as to the location of disease.

History

Patient history should assess the nature of disease onset (acute or insidious), duration and progression of clinical signs, trauma history, variations in lameness or stiffness after rest and exercise, behavioural changes and attempts at treatment.

Posture and gait analysis

Observing the dog **at rest** (standing and sitting) as well as when **walking and trotting** is essential. Affected limbs are **identified** and whether there is asymmetry in the range of motion of the joints in that limb is determined. Visual gait analysis can be challenging when multiple limbs are affected. An electronic gait analysis system is available, but requires time and training to interpret the results appropriately. [4-6]

Palpation and manipulation

Palpation can be used to identify muscle asymmetry, joint effusion, lymph node enlargement, heat and periarticular thickening.

Careful and thorough manipulation of every joint should be undertaken with the search for discomfort, a decrease in range of motion (ROM), crepitus and instability. It is also important to assess all the joints of the digits in this examination.

A **neurological examination** is essential to complete the assessment.

> While diagnosis can be straightforward, **care** must be taken to **assess** the **whole patient**.

Questionnaires & Staging tool

The Liverpool Osteoarthritis in Dogs (LOAD) [7] is a questionnaire that the owner completes at the first and subsequent visits. It leads to an assessment of how OA affects a patient's lifestyle and mobility. A score is generated (0-52) that provides a measure of clinical OA severity based on the owner's perception. **Each patient still requires a veterinary examination.**

To this end, it can be integrated in the **Canine Osteoarthritis Staging Tool** (COAST)[10].
COAST consists of 2 key steps :

- **"Grading the dog"** through a discomfort assessment by the pet owner using LOAD, a veterinary assessment of the dog's posture and mobility and then "grading the joint" by the veterinarian.
- **Staging the OA** from 0 to 4.

Preclinical	Mild	Moderate	Severe
0-1	2	3	4

COAST Stages of Canine OA

One of the advantages of the COAST is that it includes **two preclinical OA stages** (risk of developing OA), namely stages 0-1, which can be useful to **initiate an early OA management strategy.** Both LOAD and COAST can be used to monitor OA progression and response to treatment."

Imaging techniques

Radiography remains the most widely used diagnostic tool as it can detect signs such as osteophytosis, effusion, enthesophytosis, subchondral sclerosis, soft tissue swelling, intra-articular mineralisation and subchondral cysts. Radiography is a good first-line diagnostic tool to support clinical examination and rule out other diseases. [8,9]

1 Canine Osteoarthritis Diagnosis

While radiography permits the diagnosis of OA, it should not be used as a measure of OA severity, which is based on history and clinical examination.

> Imaging **is not a substitute** for careful orthopaedic examination.

Radiography provides details on OA affecting bones, but little detail on other joint tissues. Magnetic Resonance Imaging (MRI) can provide important additional information on joint and periarticular soft tissues. Computed Tomography (CT) is highly sensitive for osteophytosis and particularly useful in complex joints, such as the elbow.

Complex cases may require other imaging modalities, such as **ultrasound, arthroscopy and gamma scintigraphy.** Referral should be considered for cases where these advanced techniques are required.

If **inflammatory joint disease** or sepsis is suspected, **a synovial fluid examination** should be performed.

Clinical scoring

Clinical scoring is used in the assessment of diverse criteria, such as **lameness or pain on palpation.**
A number is assigned (e.g. lameness 1-5 and pain on palpation 1-5)[11] and can be used to **record severity on presentation and monitor response to treatment.**

Such scoring systems have been validated although variation between assessors remains a concern.

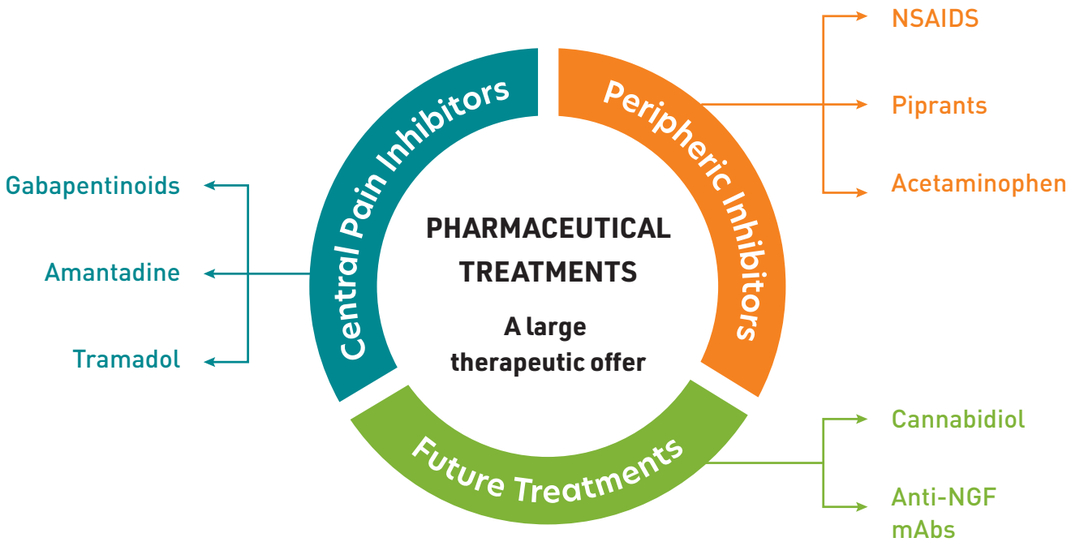
2 Pharmaceutical Treatments in OA Management


Prof. Francesco Staffieri

Dr. B. Duncan X. Lascelles


Pharmaceutical treatments for pain are the basis of the global OA care management. Numerous pain inhibitors exist to treat OA, but first-line treatments are **nonsteroidal anti-inflammatory drugs** (NSAIDs). [12]

It is noteworthy that **central inhibitors** may be also used (consider them to treat **central sensitisation** as adjunctive treatments) [13-15], and **future treatments** will soon be available - **anti-NGF** antibodies strategies look very promising. [16]



General factors to consider

Before initiating a pharmaceutical treatment :

- Consider possible **interactions** with pre-existing **diseases** and/or **treatments**
  - Remember to consider also the effects of OA on the animal
  - Involve the owner in the diagnosis and assessment of the treatment effects

As NSAIDs are the most commonly used treatments for OA pain, we have focused on advice on the practical management of NSAIDs.

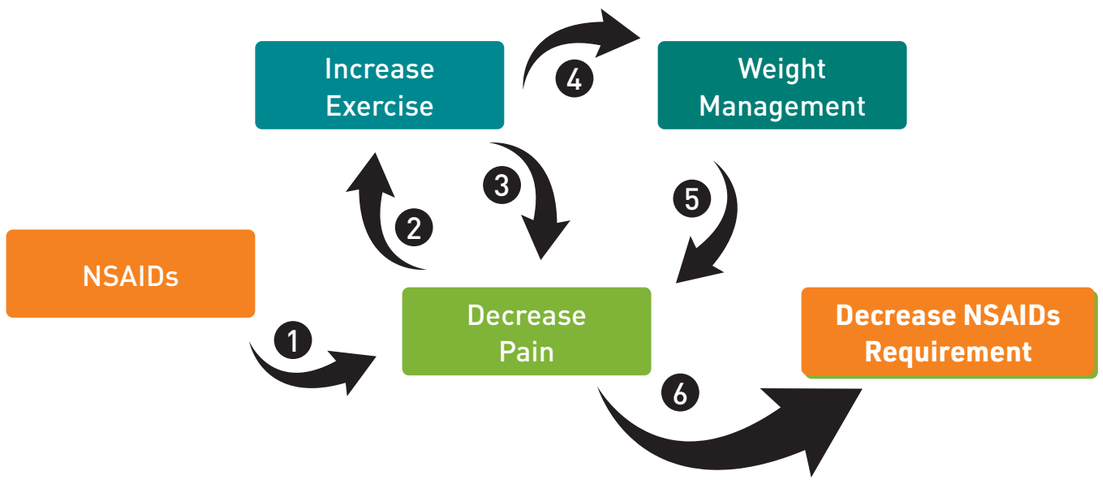
2 Pharmaceutical Treatments in OA Management

Factors to consider for NSAIDs

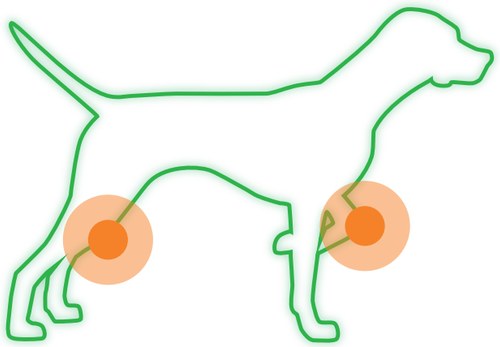
- **Best evidence of clinical efficacy** has been demonstrated for the **COX and non-COX inhibiting NSAIDs** [17]
- NSAIDs can be used to **treat chronic pain** as well as **flares** [18]
- **Recommendation** is for **long-term** administration of **NSAIDs** [19]
- **Reduction** of the NSAID dose over time is possible [20]

Modulating the NSAID dose over time

NSAIDs still have significant side effects. In a **multimodal approach, decreased pain** due to treatment allows for an **increase in exercise** that can **reduce weight,** which alleviates joint pain. This **virtuous circle** results in a reduction of the NSAIDs doses, and thus their side effects, while maintaining an acceptable level of efficacy.



Pharmaceutical Treatments in OA Management



> The pain transmission system is **bi-directionally plastic** – it can **improve** over time !

After any dose modulation, consider **pain reassessment** after a reasonable period, as maintained efficacy at a lower dose depends on the individual. [20]
Optimal OA management needs reassessments of NSAIDs efficacy on OA pain.

How to reassess treatment efficacy with NSAIDs

An exhaustive assessment should be conducted by considering **joint(s)** specifically, overall impact of disease on **patient** and treatment **tolerance.** [10]

1. Joint(s) assessment Clinical examination

- Joint manipulation (pain)
- Range of motion
- +/- Radiography

2. Patient's assessment

- Posture
- Motion
- Discomfort
- Quality of life
- Weight

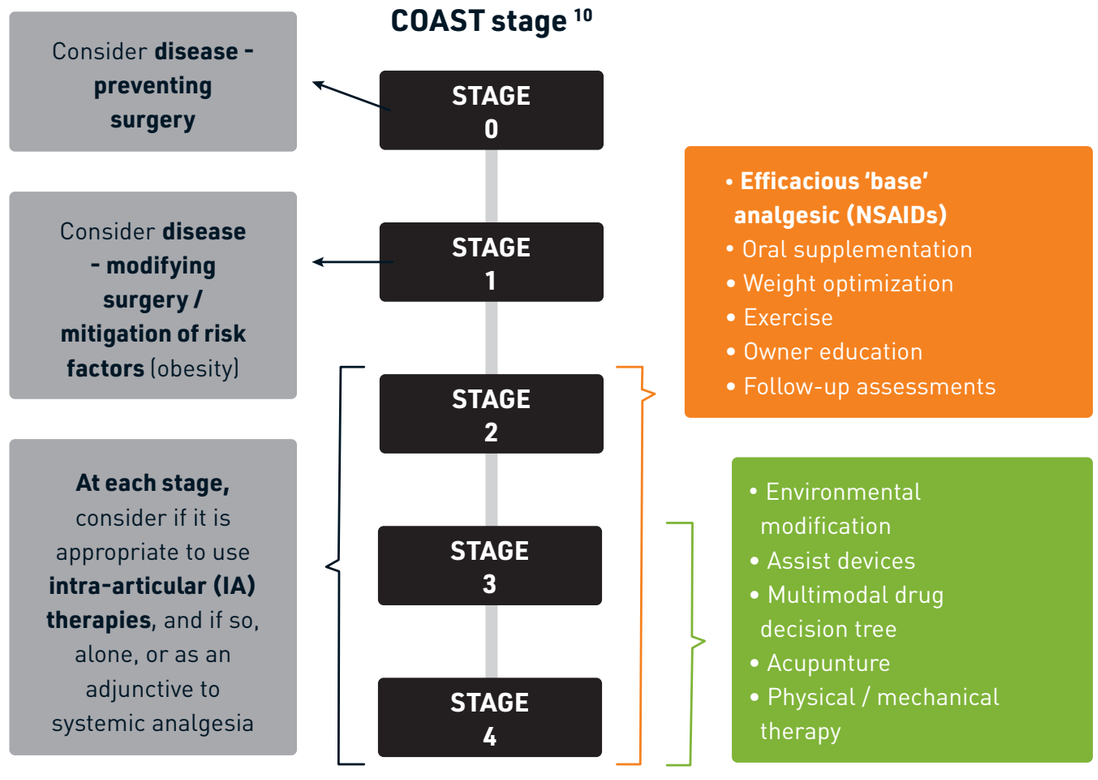
3. Assessment of drug side effect

- General clinical examination
- Patient history
- Blood work

2 Pharmaceutical Treatments in OA Management

Step-by-step approach based on the COAST stage

OA severity can be measured using a COAST questionnaire, from stage 0 to 4. Based on it, we propose hereunder a simplified overview of a multimodal approach with a pharmacological treatment as a basis for OA management from stage 2.



COAST, Canine Osteoarthritis Staging Tool

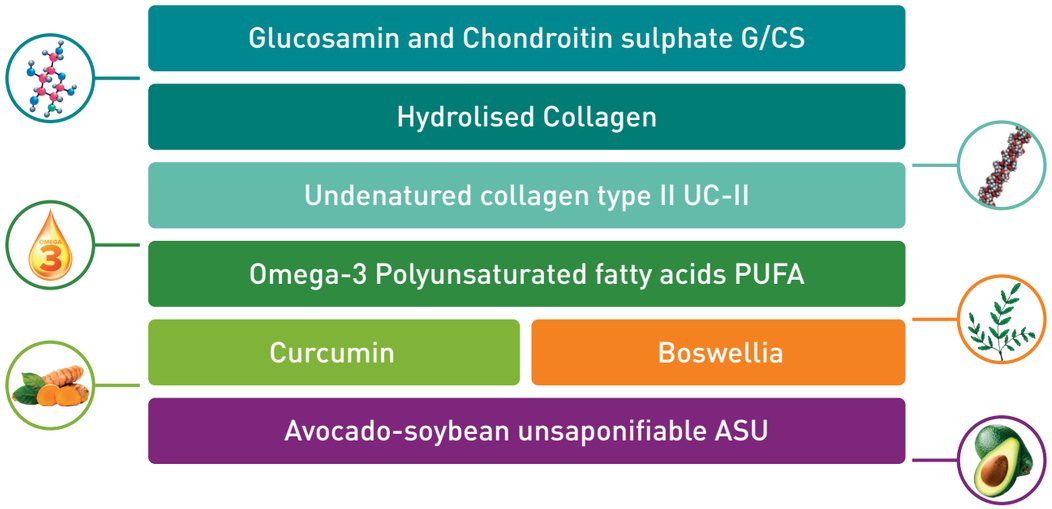
In complement to this simplified decision tree, we propose an multimodal decision tree based on pain assessment on chapter 6.

Prof. Francesco Staffieri

Classification

Oral supplements for joint support are non-drug therapies that may be included in the OA multimodal approach.

These are extracts, concentrates or combinations of vitamins, minerals, botanicals, herbs or dietary substances "for use by man to supplement the diet by increasing the total dietary intake". They can be defined as **dietary products, devoid of adverse effects,** that **provide health benefits, including prevention of disease** onset or progression".[21] Many different classes are available ; the most used are listed below : [22]



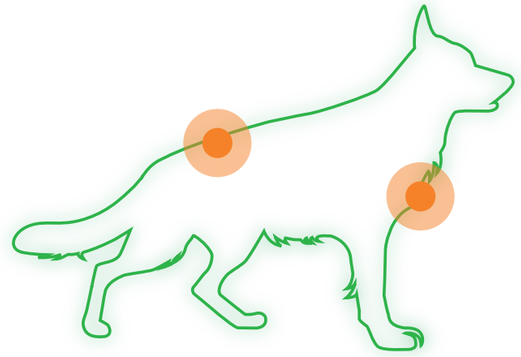
The mechanism of action of some products is often speculative and their efficacy not always supported by rigorous scientific studies[23]. Here, the aim is not to review all data providing evidence of oral supplements, but to provide advice on their place in a multimodal approach in an osteoarthritic context.

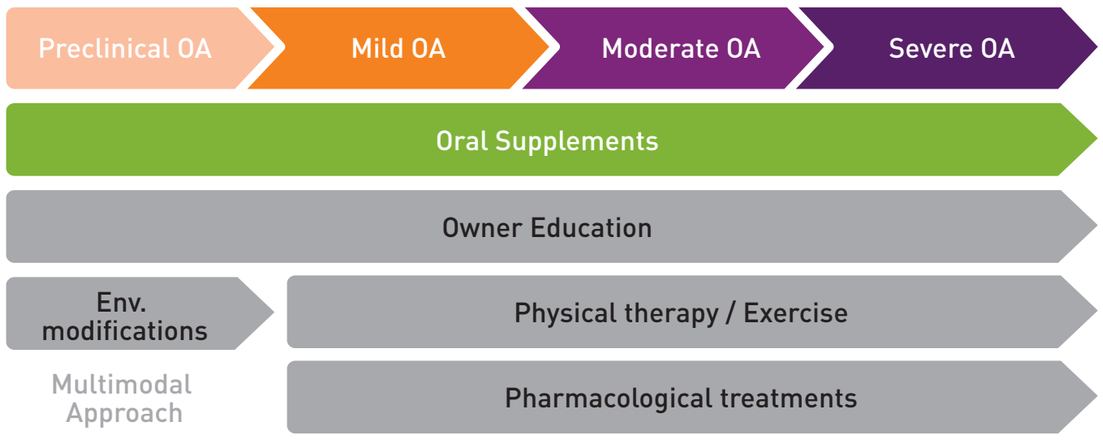
3 Oral Supplements in OA management

Place in the therapeutic strategy by OA severity stages

Oral supplements, being safe and well tolerated, can be used **as early as the preclinical OA stage** in complement with pre-therapeutic strategy. Beginning early oral supplementation at the earliest allows maximal efficacy to be achieved, as most of supplements seem to need time to be effective. [22]

Safety of use also gives oral supplements a place as an adjunct of therapeutic options in other OA stages through a **multimodal approach.**





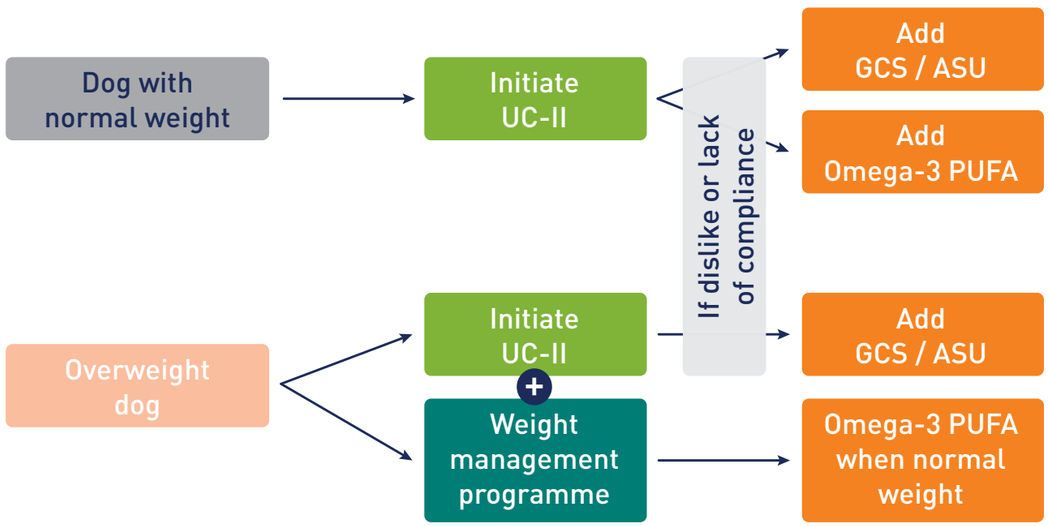
How to choose between types of oral supplements ?

Despite relative scarcity of robust research in this field, in our opinion, **dog weight** should **determine** the **choice** of the oral supplements classes to use.

Because of its specific way of action[24,25], UC-II based products should be the first choice for therapy.

An adapted **weight management programme** should be initiated in overweight dogs. In case of dislike or lack of compliance, **alternatives** are proposed hereunder.

> **Weight** is the overall **key** to success !



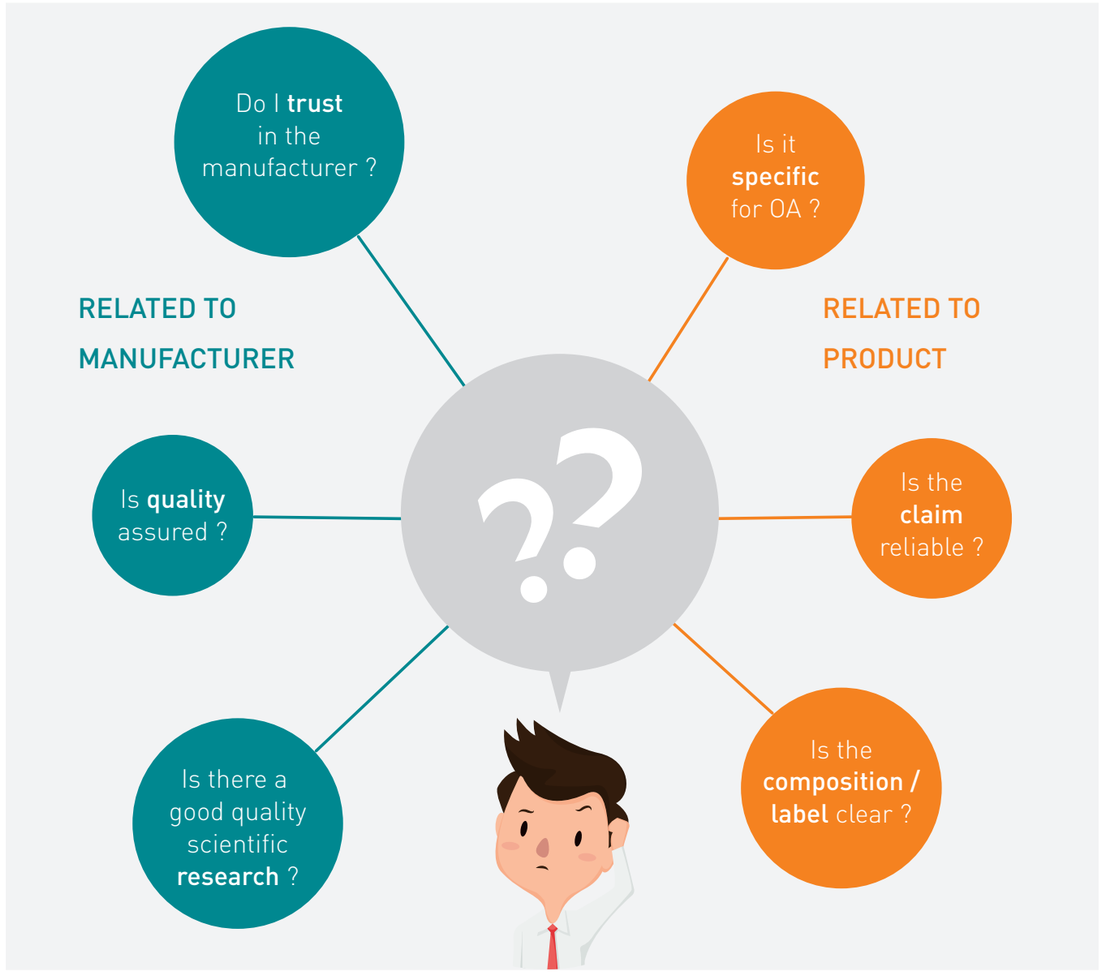
GCS : glucosamine chondroitin sulfate - UC-II : undenatured type II collagen - ASU : avocado and soybean unsaponifiables - PUFA : polyunsaturated fatty acids.

3 Oral Supplements in OA management

How to choose a branded product ?

Choosing an oral supplement **between different brands** can be confusing, considering the large amount of products available ; it may be relevant to choose in terms of **manufacturer** and **product** quality criteria.

To this end, whenever considering oral supplementation in an OA patient, we recommend **a simple list of questions** to ask when in doubt regarding a product :



Dr. Adeline Decambron

Prof. José María Carrillo

Despite looking promising, the literature is relatively scarce on these products, and products are very variable amongst studies, manufacturer and animals.
Thus ***caution should be taken,*** *indeed some experts of this Committee do not use them in daily practice. The following pages have been written by* ***experts experienced in their use with good knowledge of their product contents.*** *They provide tips for veterinarians considering the use of these products, but* ***authors advice it should be used in patients unresponsive to conventional therapies or referred to experienced clinicians.***

Platelet-Rich Plasma and **Mesenchymal Stem cells** are relative recent therapies consisting on injecting autologous products into an OA joint.

Platelet-rich plasma (PRP)

PRP can be defined as a **volume of autologous plasma with platelet concentrations above the baseline.**[26] It is already used in orthopaedics, dentistry, maxillofacial surgery, ophthalmology and dermatology.

Its use relies on its properties : [27-29]

- Platelets contain **growth factors**, some of which are greatly involved in **chondrogenesis**
  - Application of PRP accelerates the physiological process of regeneration
  - They have greater potential when combined with hyaluronic acid or MSC

PRP procedures : PROS & CONS

PROS

Easy & fast

•

Minimally invasive

•

No need for surgery

•

Generally safe

•

Noticeable effects
(high degree of **customer satisfaction**)

CONS

Heterogeneity and scarcity in the literature / no consensus
at this time on a standard regimen

•

Diversity of types of PRP[30]
processed (cell types, platelet concentrations etc.)

•

Not approved
in all countries

4 Intra-articular treatments

Mesenchymal Stem Cells (MSC)

MSC are multipotent stromal cells that can differentiate into a variety of cell types, such as osteoblasts, chondrocytes, myocytes and adipocytes [31]

They induce : [32,33]

- **Improvement in OA symptoms** based on lameness scoring, pain scoring, QoL improvement testing
- **Potential immunomodulatory effect,** despite a rapidly decreasing number of cells
- **Improvement in pain, lameness and range of motion have been observed from 1 week after the injection up to 6 months**

Periodic injections may have better efficacy than single one. [34]

MSC procedures : PROS & CONS

PROS

Expected long effect duration

•

Generally safe

•

Expected efficacy : intra-articular injection > intra-venous injection

CONS

Heterogeneity and scarcity in the literature / no consensus
at this time on a standard regimen

•

Variable number of cells
to be injected [32]

•

Short administration **time** (≤48h)

Practical advice on MSC / PRP

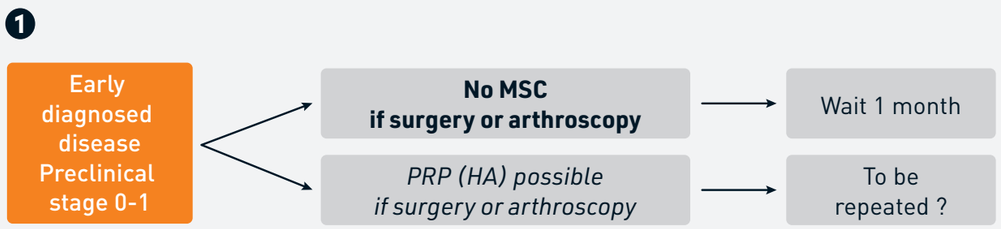
This brochure does not aim to provide official guidelines, but due to lack of evidence and lack of official recommendations, some basic principles should always be kept in mind when administering intra-articular treatments.

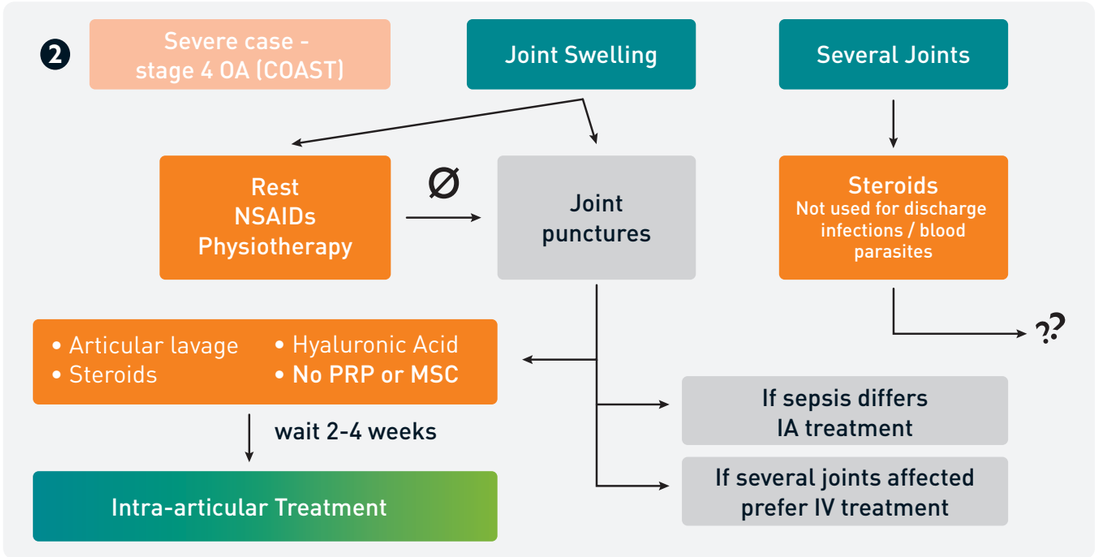
1. **Chondral regeneration is the optimal goal, but should not be the objective** when proposing intra-articular therapies to owners[33]
2. **Pain and lameness are often improved using PRP, MSC or both**
3. **Caution should always be taken as no standardised protocols are available yet**
4. They are safe products with few side effects, **but should not to be used in cancer patients or young patients (<6 months)**[33]

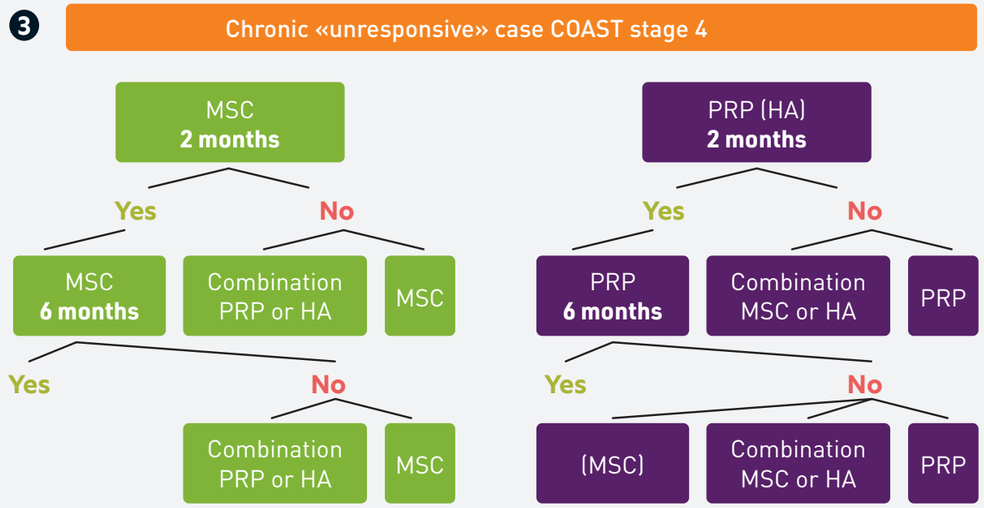
> If possible, you should **report the cases** because only few studies are available !

Proposal of decision-tree to help guidance with MSC / PRP

Keeping this advice in mind, we present a few decision trees as examples of OA management in daily practice with such products at different OA stages (as defined by COAST).







In cases that are unresponsive to all other treatments and severely clinically affected, **both MSC and PRP +/- HA can be used**. If the treatment is efficient, it can be repeated after 6 months. Otherwise, a second injection can be administered after 2 months, either using the same product or another one. Similarly, at 6 months if the treatment is unsuccessful, it can be repeated after 2 months.

5 Physiotherapy Rehabilitation & Exercise

Prof. Susanne Lauer

Dr. Jamie McClement 

Importance in global OA treatment strategy

Physiotherapy is an **important adjunct or alternative treatment** approach for OA, as it may **improve a response** to pharmaceuticals and increase **quality of life (QoL).** [35-37]

Physical therapy exercises, modalities and **assistive devices** are employed to **restore, maintain** and **maximise physical strength** and **function.** [3]

In osteoarthritic patients, physical therapy aims to :

- **Reduce pain**
- **Minimise loss of muscle mass through disuse**
- **Maintain joint function**

Whenever considering physical therapy modalities, important factors should be considered :

- **Health and fitness of the patient**
- **Environment**
- **Exercise/lifestyle and active therapies**
- **Comorbidities**

In practice, clinical benefits are maximised when physical therapy is carried out through a coordinated "team approach" rather than in isolation. The team should include the **veterinarian**, the **owner** and **professional therapists** (physiotherapist, hydrotherapist...).

Advantages:

- **More comprehensive diagnostic findings by all team members resulting in a personalised plan with concise goals**
- **Optimisation of multimodal OA management**
- **Enhanced compliance and more frequent progress checks**

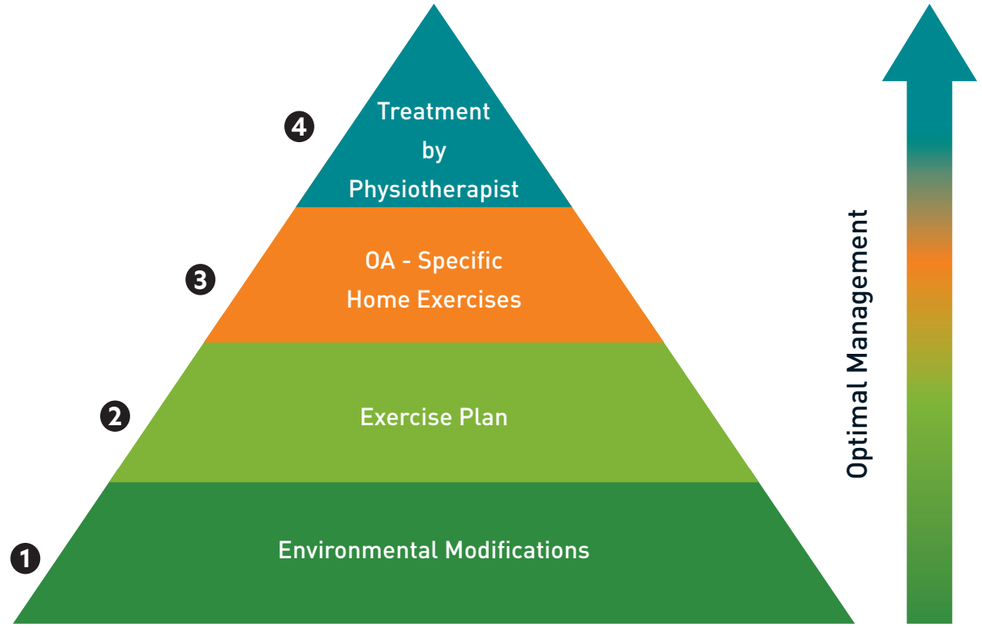
5 Physiotherapy Rehabilitation & Exercise

Better communication also creates a **bond with the owner and encourages them to invest more in the treatment programme**. They will have better compliance and notice more details relating to progress.

The physiotherapy pyramid

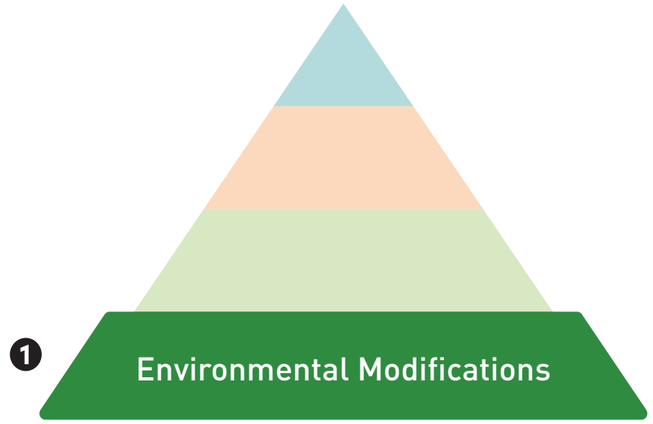
Physical therapy strategies are numerous and it is frequently overwhelming to decide where to start. The pyramid illustrates a systematic organised approach prioritising simple measures as a foundation for success in a **global approach to OA management.** [37]

Consider cost effectiveness and practicality.
Physical therapy measures should **start at the base** of the pyramid and subsequently **develop to the top.**



Each step of the **pyramid** is detailed in following pages.

5 Physiotherapy Rehabilitation & Exercise



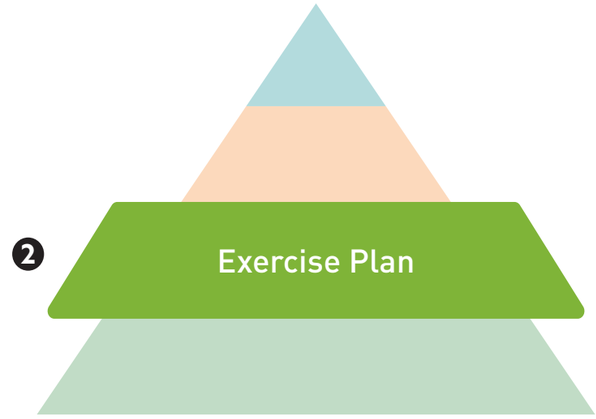
Simple cost-efficient changes in the patient's environment may have a **profound effect on the success of their treatment,** but are **often overlooked** by clinicians and owners !

1. Assess the patient's home environment with the pet owner (e.g. home visits if possible or environment videos recorded by the owner)

2. Raise the owner's awareness by using or providing a **checklist** to enable them to **identify** and **solve problems themselves**

- Improve grip on flooring to aid deteriorating proprioception and improve traction (e.g. carpets and traction mats)
- Avoid an excessive need to jump up or down, or climb/descend steps in compromised pets (e.g. ramps/facilitating steps for elevated surface access)
- Improve the comfort of sleeping surfaces
- Avoid excessive changes in temperature
- Place food and water in a position comfortable for the patient

5 Physiotherapy Rehabilitation & Exercise



Studies have shown that **obesity control** and **avoidance of a sedentary lifestyle** could r**educe the clinical OA symptoms** and result in an **increased lifespan**

1. Weight loss [38-39] to improve clinical signs in overweight canine OA patients.
The goal is to reach a **Body Condition Score** (BCS) **of 4/9**

2. Activity should not exacerbate OA symptoms, but owners should :

- Favour frequent daily low-impact activity of a shorter duration (e.g. leash walks)
- Avoid high-impact activities (jumping, running, hard playing, etc.)
- Pay attention to symptom flare-ups and adapt activities accordingly

3. Advise owners to keep an **exercise diary**

4. Consider canine **fitness monitors** (as it may improve owner compliance and provide more realistic information)

5. Include balance exercises during daily walks (use different surfaces, create safe adventure paths)

5 Physiotherapy Rehabilitation & Exercise

Cryo- and **thermo-therapy** can be **easily performed** by **owners** and are very **economical** !

1. Therapeutic exercises [37,40]
   - Balance/weight shifting
   - Cavaletti poles/manoeuvring light obstacles (e.g. boxes)
   - PROM of affected joints
   - Treadmill walking
   - Trotting uphill (OA forelimbs) or downhill (OA hindlimbs)
   - Sit-to-stand exercises

2. Massage
   - Vasodilation and muscle spasm reduction
   - Enhanced compliance of joint tissues (helpful prior to PROM)
   - Temporary pain reduction

3. Cryotherapy (supportive care)
   - Vasoconstriction and pain control
   - Particularly useful in acute inflammation or after exercise

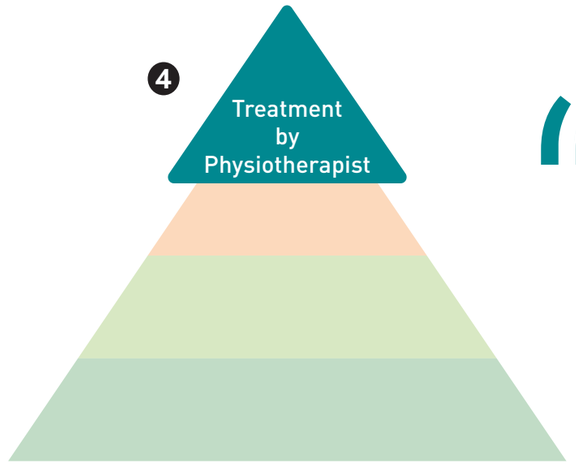
4. Thermotherapy with heat packs (supportive care)

Probably better to avoid in **senior and geriatric patients :**

- Abrupt or extreme alteration of exercise intensity
- Games with intense quick body contacts
- Complex movements
- Abrupt change in direction
- Excessive competition
- Extreme climatic conditions

PROM, passive range of motion

5 Physiotherapy Rehabilitation & Exercise



For the **best results**, none of us should work in isolation. Always ask for feedback from physiotherapists and owners. **Communication is key !**

Professionally trained canine physiotherapists...

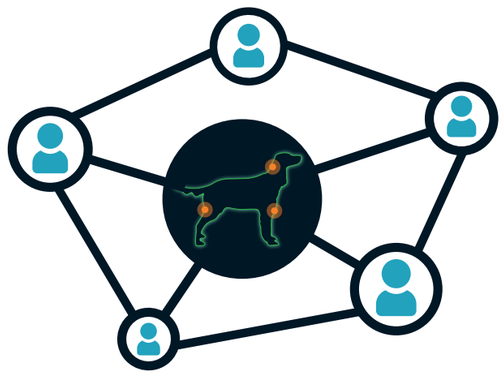
- Diagnose specific disorders and deficits
- Provide realistic therapy plans tailored to the individual patient and owner
- Actively involve the patient's owner in the treatment
- Modify the treatment plan according to progress
- Have access to numerous advanced modalities with the potential to improve QoL in complex OA patients, such as : [41-43]

➔ Laser and transcutaneous electrical nerve stimulation (TENS)

➔ Extracorporeal shock wave therapy

➔ Nuclear magnetic resonance therapy

➔ Aquatic exercise



6 Multimodal Approach based on Pain Assessment

Finally, as **pain** can be a major issue in OA patients, and following all our previous comments and insights, we recommend a decision tree to provide guidance for a **multimodal approach to treat OA patients based on pain.**

Assessment of pain in the OA patient

Veterinarian Assessment :
Observation
Function
Palpation

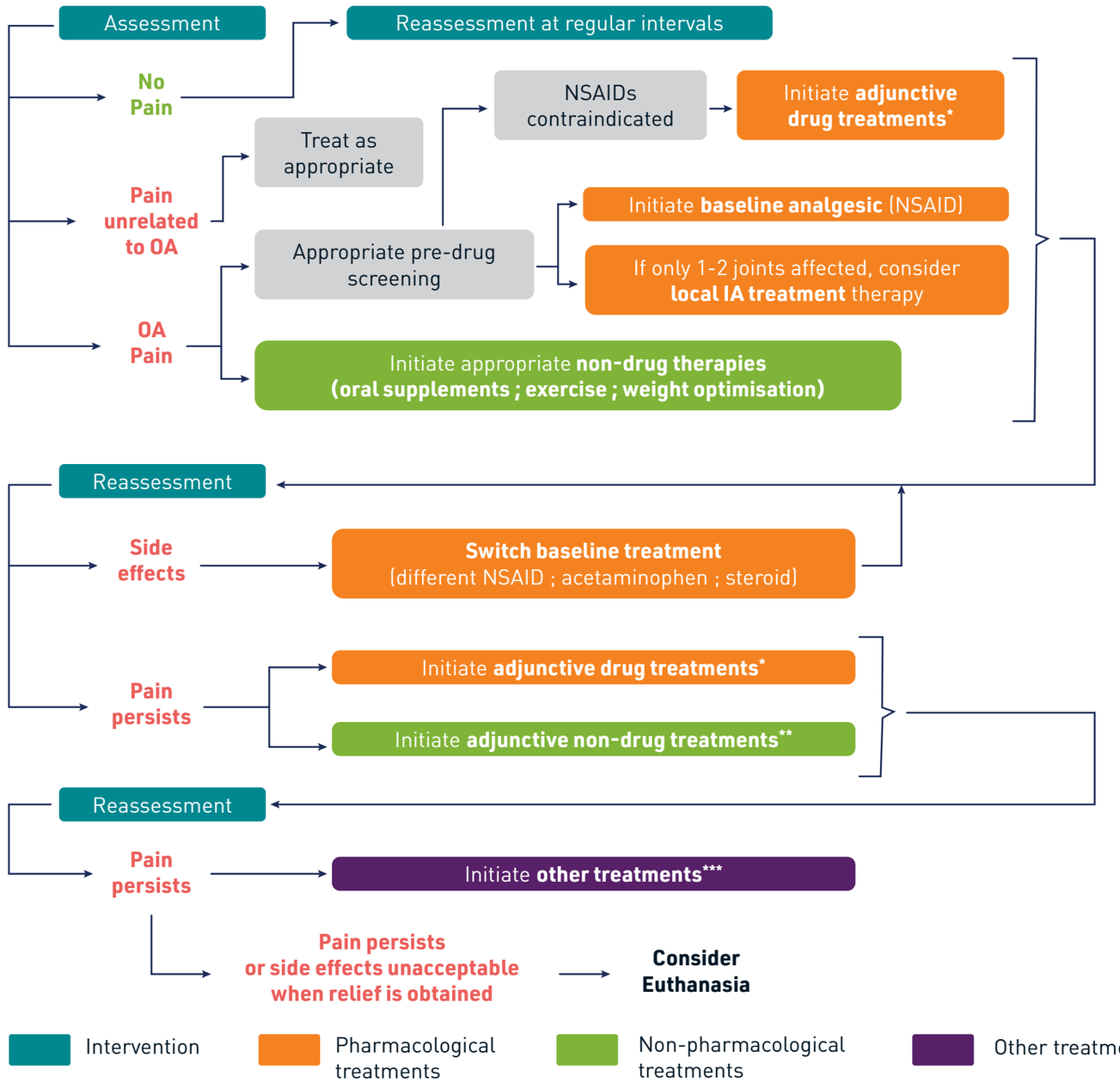
Owner Assessment

Reassessment of pain in the OA patient

Owner + Veterinarian Assessment :

- First reassessment at 1 month maximum
- Reassess approx. every 1-2 months
- Eventually prolong the time of reassessment if pain is controlled

For success, consider :
→ **Frequent assessments** and **reassessments**
→ **Optimal cooperation and communication** between all the actors of the care strategy



* **Adjunctive systemic drugs to consider adding into the therapy**
(if response is poor, consider increasing the dose where possible)

NMDA antagonists
Gabapentin

TCAs / SNRIs
Tramadol

Local IA treatment

** **Adjunctive non-drug treatments to consider**

Rehabilitation / Therapeutic Exercise

Massage

Pulsed Electromagnetic Magnetic Field Therapy

Therapeutic Ultrasound

*** **Other treatments to consider**

'Wind-down therapy'

Surgical intervention

IA drugs

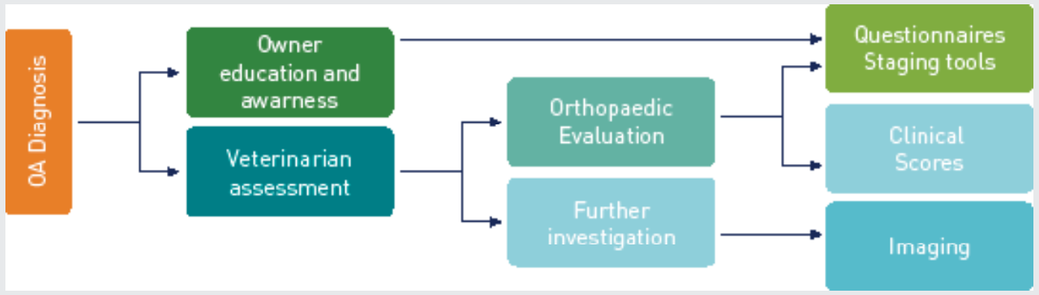
Neurolytic procedures

IA, intra-articular; NMDA, N-methyl-D-aspartate; TCAs, tricyclic antidepressants; SNRIs, selective norepinephrine reuptake inhibitors

6 Multimodal Approach based on Pain Assessment

Canine OA Diagnosis

→ The orthopaedic evaluation always constitutes the basis of the diagnosis.
Imaging is not a substitute for careful orthopaedic examination.



→ Radiography is a good first-line tool to support clinical examination and rule out other diseases. Advanced techniques may be required for complex cases.

→ Questionnaires and validated scoring systems are comprehensive and consistent ways to assess and monitor OA.

Early diagnosis depends on early client education !

→ Encourage basic orthopaedic examination at routine visits.

→ An early OA diagnosis allows for an early care strategy.

→ The COAST questionnaire includes **two preclinical OA stages** that can be useful to **initiate an early OA management strategy.**

Pharmaceutical Treatments in OA Management

→ First-line treatments of OA pain are **nonsteroidal anti-inflammatory drugs** (NSAIDs). **Central inhibitors** may be also used to treat **central sensitisation** as adjunctive treatments.

Before initiating a pharmaceutical treatment

→ Consider possible interactions with pre-existing diseases and/or treatments

→ Involve the owner for the diagnosis and the assessment of the effects of treatment

Factors to consider regarding NSAIDs

→ NSAIDs can be used to treat chronic pain as well as flares

→ Recommendation is for long-term administration of NSAIDs

→ Dose reduction of NSAIDs over time is possible

→ Optimal OA management needs frequent reassessments of NSAIDs efficacy on OA pain

→ An **exhaustive NSAIDs assessment** should be conducted by considering

- **Joint(s)** specifically
- Overall impact of the disease on the **patient**
- Treatment **tolerance**

Treatment planning and reassessment

The key to treatment success is to evaluate severity, plan treatment and reassess frequently

- Scheduled visits
- Dose
- Compliance
- Active follow-up between visits

Intra-articular treatments : Stem cells and Platelet Rich Plasma

→ **Platelet-Rich Plasma** and **Mesenchymal Stem cells** are relative recent therapies consisting of injecting autologous products in an OA joint.
→ **Chondral regeneration** is the optimal goal, but should not be the objective when proposing intra-articular therapies to owners
→ Pain and lameness are often improved using PRP, MSC or both

→ Caution should always be taken as no standardised protocols are available yet

→ They are safe products with few side effects, but should not to be used in cancer patients or young patients (<6 months)

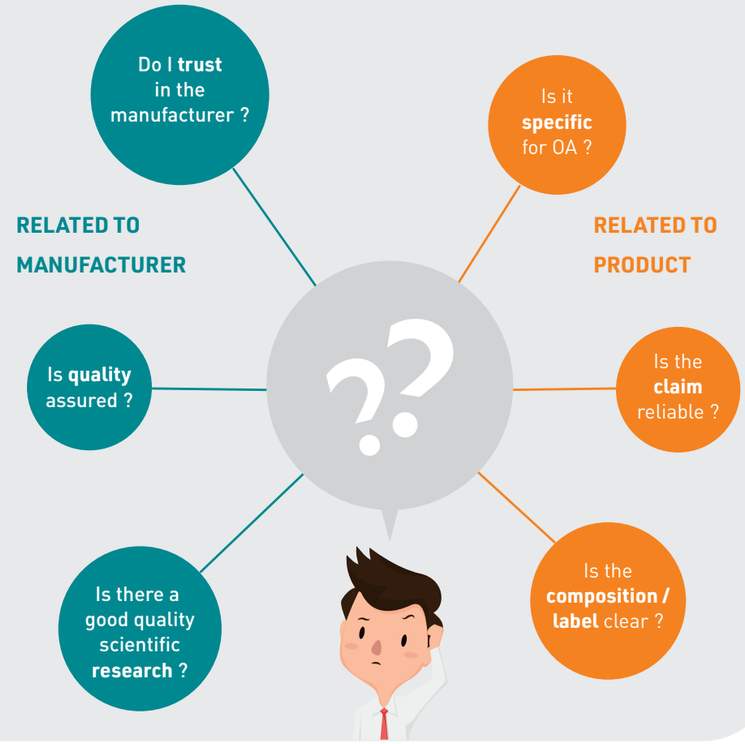
The authors of this chapter advice it should be used in patients unresponsive to conventional therapies or referred to experienced clinicians

In a Nutshell

Oral Supplements in OA Management

→ Oral supplements, being safe and well tolerated, can be used **as early as the preclinical OA stage** in a pre-therapeutic strategy and can be safely used in all OA stages.
→ **Dog weight** should **determine** the **choice** of the oral supplements classes to use. An adapted **weight management programme** should be initiated in overweight dogs.
→ **Because of its specific way of action, UC-II based products should be the first choice for therapy. In case of dislike or lack of compliance, alternatives exist.**

→ Considering the relative scarcity of literature in this field, ask these questions when choosing an oral supplement.



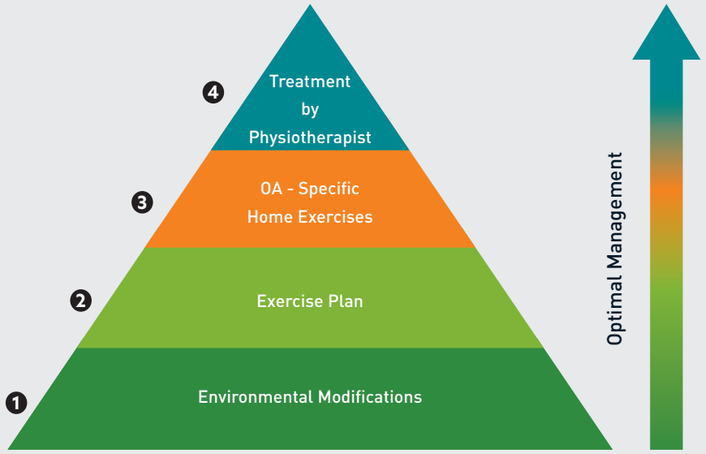
In a Nutshell

Physiotherapy : Rehabilitation & Exercise

→ **Physiotherapy is an important adjunct or alternative treatment.**

→ **Approach to OA, as it may improve response to pharmaceuticals and increase quality of life.**

→ Remember the **PT pyramid** for optimal management



Communication is key !

→ Clinical benefits are maximised when physical therapy is done through a "team approach".

→ The team should include the **veterinarian**, the **owner** and **professional therapists**.

→ Always ask for feedback from physiotherapists and owners.

→ **Better communication** also creates a **bond with owners and encourages them to invest more in the treatment programme**. They will have better compliance and notice more details relating to progress.

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