



# BestBETS for Vets

Supporting veterinary clinicians in making evidence-based decisions



The University of  
Nottingham

UNITED KINGDOM · CHINA · MALAYSIA

## Nutraceuticals versus carprofen in dogs with osteoarthritis

### Clinical Scenario

Sally White is a 12 year female neutered black Labrador presented to you with right forelimb lameness and difficulty jumping into the car. She has decreased range of movement in both hips and the right elbow. You have just x-rayed her hips, stifles, shoulders and elbows and she has significant osteoarthritis in all joints. You recommend a course of Rimadyl (carprofen) but Mrs White, Sally's owner, takes daily glucosamine for her osteoarthritis and wants to know if it works in dogs. She is also very worried about the side effects of NSAIDs. You wonder if a nutraceutical could be better at controlling the clinical signs of osteoarthritis than carprofen...

### 3-Part Question (PICO)

In [dogs with osteoarthritis] is a [glucosamine & chondroitin supplement vs. carprofen] better at [reducing the clinical signs of osteoarthritis]?

### Search Strategy

#### MEDLINE(R) In-Process & Other Non-Indexed Citations and MEDLINE(R) 1946 to Present using the OVID interface

(dog.mp. OR dogs.mp. OR canine.mp. OR canines.mp. OR canis.mp. OR canid.mp. OR canids.mp. OR canidae.mp. OR exp Dogs/ OR exp Canidae/)

**AND**

(osteoarthritis.mp. OR osteo-arthritis.mp. OR arthritis.mp. OR joint disease.mp. OR joint diseases.mp. OR DJD.mp. OR exp Osteoarthritis/ OR exp Arthritis/ OR exp Joint Diseases/)

**AND**

(carprofen.mp. OR rimadyl.mp. OR rimifin.mp. OR canidryl.mp. OR carprodyl F.mp. OR dolagis.mp. OR rycarfa.mp. OR zenecarp.mp. OR carprogesic.mp.)

**AND**

(glucosamine.mp. OR glucosamines.mp. OR chondroitin.mp. OR chondroitins.mp. OR nutraceutical.mp. OR nutraceuticals.mp. OR exp Glucosamine/ OR exp Chondroitin sulfates/ OR exp Chondroitin/ OR exp Chondroitin Sulfate Proteoglycans/ OR exp Dietary Supplements/)

## CAB Abstracts 1910 to Present using the OVID interface

(dog.mp. OR dogs.mp. OR canine.mp. OR canines.mp. OR canis.mp. OR canid.mp. OR canids.mp. OR canidae.mp. OR exp dogs/ OR exp Canis/ OR exp Canidae/)

### AND

(osteoarthritis.mp. OR osteo-arthritis.mp. OR arthritis.mp. OR joint disease.mp. OR joint diseases.mp. OR DJD.mp. OR exp osteoarthritis/ OR exp arthritis/ OR exp joint diseases/)

### AND

(carprofen.mp. OR rimadyl.mp. OR rimifin.mp. OR canidryl.mp. OR carprodyl F.mp. OR dolagis.mp. OR rycarfa.mp. OR zenecarp.mp. OR carprogesic.mp.)

### AND

(glucosamine.mp. OR glucosamines.mp. OR chondroitin.mp. OR chondroitins.mp. OR nutraceutical.mp. OR nutraceuticals.mp. OR exp glucosamine/ OR exp chondroitin sulfate/)

## Search Outcome

### MEDLINE

- 13 papers found in MEDLINE search
- 10 papers excluded as they don't meet the PICO question
- 0 papers excluded as they are in a foreign language
- 0 papers excluded as they are review articles/in vitro research/conference proceedings
- 3 total relevant papers from MEDLINE

### CAB Abstracts

- 16 papers found in CAB search
- 13 papers excluded as they don't meet the PICO question
- 0 papers excluded as they are in a foreign language
- 0 papers excluded as they are review articles/in vitro research/conference proceedings
- 3 total relevant papers from CAB

### Total relevant papers

3 relevant papers from both MEDLINE and CAB Abstracts

## Summary of Evidence

### Alves et al.(2017) Portugal

**Title:** Effect of an oral joint supplement when compared to carprofen in the management of hip osteoarthritis in working dogs

**Patient group:** 15 working police dogs from the Guarda Nacional Republica

**Study Type:** Randomised controlled trial

- Outcomes:**
- Canine Brief Pain Inventory (CBPI) - split into Pain Severity Score (PSS) and Pain Interference Score (PIS) completed by trainers at baseline, 15 days, 30 days, then monthly to 6 months.
  - Hudson Visual Analog Scale (HVAS) completed by trainers at baseline, 15 days, 30 days, then monthly to 6 months.
  - Qualitative quality of life assessment completed by trainers at baseline, 15 days, 30 days, then monthly to 6 months (mentioned in the results section).
  - Haematology and biochemical data and urinalysis performed at days 0, 30 and 70.

**Key Results:**

- No significant difference found between baseline data and any subsequent time point using the CBPI (no difference in either PSS or PIS), HVAS or quality of life measures for either the glucosamine/chondroitin supplement or the positive control (carprofen) groups.
- No significant changes in haematological, biochemical or urinary parameters reported in either group.
- The authors report on "treatment success" for individual dogs receiving carprofen; no individual dogs' treatment success was described for dogs receiving glucosamine/chondroitin.

**Study Weaknesses:**

- Poor reporting of basic data (e.g. age, breed, sex and living conditions of dogs not described).
- Small sample size of 15 dogs not justified with a power calculation.
- No data provided to determine whether groups were comparable at baseline.
- Method of randomisation not reported.
- Veterinary surgeons performing clinical assessments may not have been blinded.
- CBPI and HVAS tools not adequately described within this paper to enable disease severity data to be interpreted.
- Quality of life assessment measure used was not validated.
- Haematological and biochemical data not reported.
- Only aggregated results were provided; unclear how many dogs were assessed at each timepoint.
- Results of statistical analysis not presented in numerical format.
- Relatively large spread of scores for CBPI and HVAS at all timepoints
- No statement on who funded the study.

**Attachment:**



Evidence appraisal (/soe\_attachments/521/3914-CA Alves paper.pdf)

## McCarthy et al. (2007) Ireland

**Title:** Randomised double-blind, positive-controlled trial to assess the efficacy of glucosamine/chondroitin sulfate for the treatment of dogs with osteoarthritis.

**Patient group:** 42 client owned dogs with osteoarthritis recruited via veterinarians

**Study Type:** Controlled clinical trial

**Outcomes:**

- Severity of clinical signs (clinical scoring system) – made up of 5 parts - lameness, joint mobility, pain on palpation, weight-bearing, overall score of clinical condition. Measured at day 14, 42, 70, and 98

**Key Results:**

- Glucosamine/chondroitin group – significant improvements ( $P < 0.001$ ) in pain, weight bearing and overall condition at Day 70 compared to pre-treatment scores. No significant improvement for these outcomes was seen at any other time points, and no significant effect was identified on joint mobility or lameness at any time point.
- Carprofen group – significant improvements in all five outcomes, but not at all time points. Weight bearing and joint mobility were improved at 14, 42 and 70 days (also at day 98 for weight bearing). Joint pain was improved at day 42, lameness at day 70 and overall score at days 42 and 70.
- The average improvement in pain scores at day 70 were comparable between groups.
- A mean reduction in disease score in the carprofen group was greater than the glucosamine/chondroitin group group at day 70 for lameness, joint mobility, weight bearing and overall condition.

**Study Weaknesses:**

- Patients were not randomly selected
- Patients were assigned to alternate treatment groups via order or recruitment rather than true randomisation
- Outcome measure used was unvalidated and possibly subjective
- Sample size justification was not given although a power calculation was performed
- Groups may not have been comparable by age or weight
- Unclear how scoring was performed on dogs with both hip and elbow osteoarthritis
- Basic data were poorly described
- Seven dogs dropped out before day 70
- The authors discuss non-inferiority but this trial does not appear to have been designed to test non-inferiority
- Conclusions were made about glucosamine/chondroitin even though no comparisons to a placebo were available
- Study funded by manufacturers of the supplement

**Attachment:**

Evidence appraisal (/soe\_attachments/521/3915-CA McCarthy final.pdf)

**Moreau et al. (2003) Canada**

**Title:** Clinical evaluation of a nutraceutical, carprofen and meloxicam for the treatment of dogs with osteoarthritis.

**Patient group:** 71 dogs with clinically and radiologically confirmed osteoarthritis recruited from veterinary teaching hospital records or via a newspaper advertisement

**Study Type:** Randomised controlled trial

- Outcomes:**
- Changes in ground reaction forces (GRF) compared to healthy dogs
  - Subjective owner assessment of the dog's activity and pain
  - Subjective veterinary assessment
  - Radiographic assessment
  - Wide range of haematological and biochemical parameters assessed
  - Faecal samples tested for occult blood

**Key Results:**

- The authors report that dogs treated with chondroitin-glucosamine-manganese showed no significant response in objective gait analysis (GRF) or both of the subjective assessments but no data are presented to support this.
- There was a significant improvement in the subjective orthopaedic assessment of dogs treated with carprofen at day 30 (summary data only presented), but no significant response in terms of the owners' subjective assessment (no data presented).
- Some dogs treated with carprofen showed improvements in GRF, but none of the dogs returned to "normal" values.

**Study Weaknesses:**

- Patients were not randomly selected
- The subjective scoring systems used by owners and veterinary surgeons were not validated
- Details of how the subjective scoring system was used by veterinary surgeons are not clearly described
- There was no description of assessor blinding for owners or veterinary surgeons in the materials and methods section
- Results are poorly presented and some results described in the text have no supporting data
- Sample size justification was not given and a power calculation was not performed
- Multiple dogs were excluded from the analyses
- Conclusions are drawn on animals treated and completing the study rather than intention to treat
- Multiple subgroups are described, the statistical validity of which is unclear
- GRF data are compared with results from "10 normal dogs" about which no detail is provided
- Results comparing the efficacy of carprofen and glucosamine/chondroitin are reported only in a one line summary
- The study was funded by Boehringer Ingelheim, manufacturers of Metacam which was the third comparator treatment included in this study

**Attachment:**

Evidence appraisal (/soe\_attachments/521/3916-CA Moreau final.pdf)

## Comments

This is an updated version of the BET originally published in September 2013, authored by Dr Martin Downes and Dr Rachel Dean, with the addition of a new paper.

The quality of the three studies included in this BestBET are questionable. All three lack a sample size calculation, and data on how randomisation was performed was not always provided, or clear. One of the trials (Moreau et al., 2003) made no comparison between the two treatments under investigation even though they set out to do this in their aim.

There is a critically appraised topic published by McKenzie (2010) reviewing the same topic, which drew similar conclusions to this BestBET. Systematic reviews (Aragon et al., 2007, Sanderson et al., 2009) have appraised the evidence associated with a range of treatments for osteoarthritis, but these reviews did not specifically examine the difference between carprofen and glucosamine/chondroitin sulphate in relation to efficacy. Further good quality studies are needed to gain more scientific knowledge on this subject area.

## Bottom line

**There are a lack of good quality clinical trials to answer this question. There is a suggestion that carprofen is superior to glucosamine/chondroitin supplements in reducing clinical signs of osteoarthritis but better quality evidence is required to definitively answer the question.**

#### Disclaimer

The BETs on this website are a summary of the evidence found on a topic and are not clinical guidelines. It is the responsibility of the individual veterinary surgeon to ensure appropriate decisions are made based on the specific circumstances of patients under their care, taking into account other factors such as local licensing regulations. **Read small print (/disclaimer)**

## References

Alves JC, Santos AM, Jorge PI, (2017). Effect of an oral joint supplement compared to carprofen in the management of hip osteoarthritis in working dogs. *Topics in Companion Animal Medicine* **32**: 126-129.

Aragon CL, Hofmeister EH, Budsberg SC, (2007). Systematic review of clinical trials of treatments for osteoarthritis in dogs. *Journal of the American Veterinary Medical Association* **230**: 514-521.

McCarthy G, O'Donovan J, Jones B, McAllister H, Seed M, Mooney, C, (2007). Randomised double-blind, positive-controlled trial to assess the efficacy of glucosamine/chondroitin sulfate for the treatment of dogs with osteoarthritis. *Veterinary Journal* **174**: 54-61.

McKenzie BA (2010). What is the evidence? There is only very weak clinical trial evidence to support the use of glucosamine and chondroitin supplements for osteoarthritis in dogs. *Journal of the American Veterinary Medical Association* **237**: 1382-1383.

Moreau M, Dupuis J, Bonneau NH, Desnoyers M, (2003). Clinical evaluation of a nutraceutical, carprofen and meloxicam for the treatment of dogs with osteoarthritis. *Veterinary Record* **152**: 323-329.

Sanderson RO, Beata C, Flipo RM, Genevois JP, Macias C, Tacke S, Vezzoni A, Innes JF, (2009). Systematic review of the management of canine osteoarthritis. *Veterinary Record* **164**: 418-424.

### About this BET

#### First author:

Zoe Belshaw

#### Second author:

Marnie Brennan

#### Institution:

CEVM, University of Nottingham

#### Search last performed:

2018-07-23 22:09:19

#### Original publication date:

2018-07-31 22:09:19

#### Last updated:

2018-07-31 22:09:19

**Copyright 2020. Centre for Evidence-based Veterinary Medicine**