



Fish collagen peptides for **Joint health**

Osteoarthritis (OA) is described as a chronic degenerative condition that affects the joints and is responsible for **pain, stiffness, impaired movement and quality of life**. It is the result of a combination of risk factors, of which increasing age and obesity are the most important. Osteoarthritis is an important cause of disability, affecting more than half of the people aged 65 years or older. It is the most prevalent joint disease. To date, the only available treatments aim at reducing symptoms as pain and inflammation, maintain joint mobility and limit the loss of function.



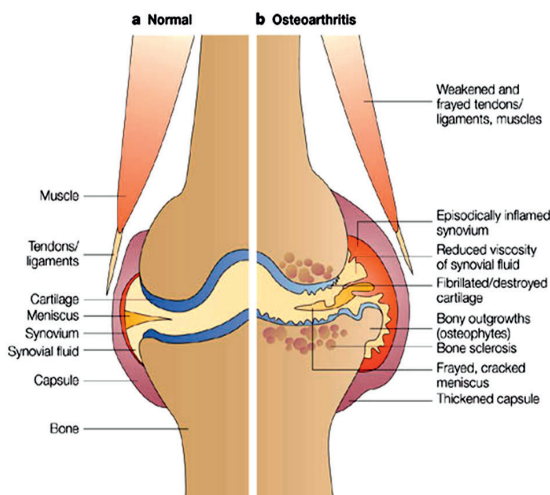
WELL-BEING

In this study, Naticol® has clinically showed its benefits in joint comfort.

Source: Nature reviews, Drug discovery 4, 331-344 (April 2005)

a | Healthy tissue is shown: normal cartilage without any fissures, no signs of synovial inflammation.

b | Early focal degenerate lesion and 'fibrillated' cartilage, as well as remodelling of bone, is observed in osteoarthritis. This can lead to bony outgrowth and subchondral sclerosis.



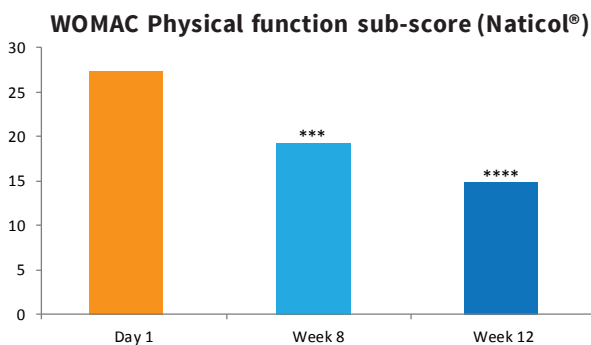
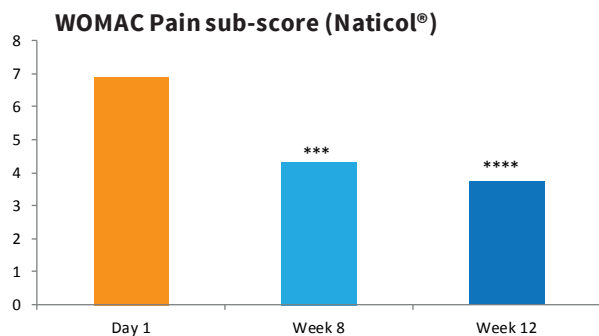
CLINICAL STUDY AFCRO076 – METHODS AND RESULTS

This clinical study was double-blind, randomized, against placebo. It was carried on 30 subjects, mean-aged 61 y.o, for 8 and 12 weeks. As a primary objective, improvement in treatment after a daily oral intake of 10g of Naticol® was assessed with reduction in Western Ontario McMaster Universities (WOMAC). Quality of life (QOL) scores and short physical performance battery (SPPB) scores from baseline to week 12 were also evaluated. Safety and tolerance were assessed.

This study was conducted by Atlantia/Hospital of Cork (Rheumatology department, Prof. Ted DINAN, Ireland) and was approved by the local Ethical Committee (CPP). Consent was obtained from each subject before entry in the study.

› WOMAC Pain and Physical function scores - fig.1 & 2

The WOMAC sub-scores for both pain and physical function were significantly decreased for 10g/d Naticol® after Week 8 ($p \leq 0,001$) while no significant change was recorded in the Placebo group. Significant decreases were also obtained for WOMAC pain and physical function scores at week 12 in Naticol® group ($p < 0,0005$). These low WOMAC sub-scores indicate a lower degree of pain but also a lower degree of difficulty in physical function.



Figures 1 & 2 - WOMAC Pain and Physical function sub-scores- Up : mean WOMAC Pain score values at baseline , after 8 and 12 weeks of treatment; Down: mean WOMAC physical function score at baseline, after 8 and 12 weeks; * $p < 0,001$; **** $p < 0,0005$.**

› Quality of life (QOL) : role limitations due to physical problem score (SF-36V2) - Fig.3

This score expresses how much of the time volunteers have had problems as a result of their physical health for the last 4 weeks. The score of limitations due to physical problems was statistically significantly increased for 10g/d Naticol® after Week 12 while no significant change was seen in the Placebo group. A high score is a positive answer as it translates minor limitations due to physical problems.

Role limitations due to physical problem score (SF-36v2)

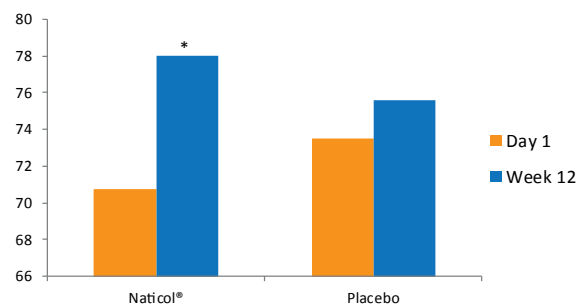


Figure 3 - Role limitations due to physical problem score (SF-36V2); The responses are coded as follows: 0 = All of the time; 25 = Most of the time; 50 = Some of the time; 75 = A little of the time; 100 = None of the time. * $p < 0,05$

› Short physical performance assays using Chair test - Fig.4

Short physical performance battery tests were used to assess physical performance. Chair test score was significantly increased for 10g/d Naticol® after Week 12 while no significant change was statistically seen in the Placebo group.

SPPB - Significant improvement of chair test score

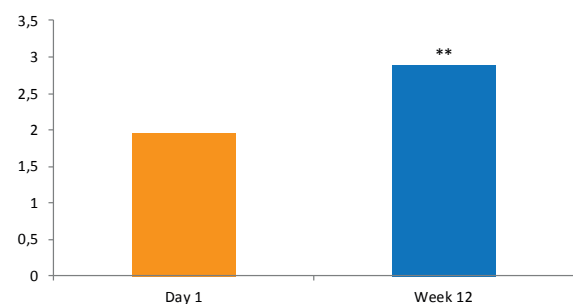


Figure 4 - Physical performance using short physical performance battery test: Chair test; ** $p < 0,01$

› Tolerance

It was evaluated through a clinical examination and volunteer's questionnaire. Naticol® presents globally a good tolerance.

› Conclusion

The results of oral ingestion of 10g Naticol® on a daily basis, up to 12 weeks, clinically showed that regular intake of Naticol® may alleviate symptoms of knee osteoarthritis such as pain, physical function (WOMAC scores). **Naticol® has clinically demonstrated its role as an ingredient in Joint health applications.**

References: Dillon, Charles F, Rasch, Elizabeth K, Gu, Qiuping, Hirsch, Rosemarie, 2006. Prevalence of knee osteoarthritis in the United States: arthritis data from the third national health and nutrition examination survey 1991-94. *The J.Rheumatol.* 33 (11), 2271-2279

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.