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## Food pyramid for subjects with chronic pain: foods and dietary constituents as anti-inflammatory and antioxidant agents.

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### Abstract

Emerging literature suggests that diet constituents may play a modulatory role in chronic pain (CP) through management of inflammation/oxidative stress, resulting in attenuation of pain. We performed a narrative review to evaluate the existing evidence regarding the optimum diet for the management of CP, and we built a food pyramid on this topic. The present review also describes the activities of various natural compounds contained in foods (i.e. phenolic compounds in extra-virgin olive oil (EVO)) listed on our pyramid, which have comparable effects to drug management therapy. This review included 172 eligible studies. The pyramid shows that carbohydrates with low glycaemic index should be consumed every day (three portions), together with fruits and vegetables (five portions), yogurt (125 ml), red wine (125 ml) and EVO; weekly: legumes and fish (four portions); white meat, eggs and fresh cheese (two portions); red or processed meats (once per week); sweets can be consumed occasionally. The food amounts are estimates based on nutritional and practical considerations. At the top of the pyramid there is a pennant: it means that CP subjects may need a specific customised supplementation (vitamin B12, vitamin D, n-3 fatty acids, fibre). The food pyramid proposal will serve to guide dietary intake with to the intent of alleviating pain in CP patients. Moreover, a targeted diet can also help to solve problems related to the

drugs used to combat CP, i.e. constipation. However, this paper would be an early hypothetical proposal due to the limitations of the studies.

**KEYWORDS:** ALA  $\alpha$ -linolenic acid; COX cyclo-oxygenase; CRP C-reactive protein; EVO extra virgin olive oil; LAO long-acting specific opioid formulation; MCP-1 monocyte chemotactic protein-1; NMDA N-methyl-d-aspartate; NSAID non-steroidal anti-inflammatory drug; OA osteoarthritis; OIC opioid-induced constipation; SIRT1 sirtuin-1; TLR Toll-like receptor; TRP transient receptor potential; Antioxidants; Chronic pain; Constipation; Food pyramid; Inflammation; Nutrients; Opioids

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