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Author Response

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Author Response

We thank Gentzel for his careful reading of our article.[1] His letter to the editor[2] is enriching, as it facilitates the international debate regarding pain treatment and pain mechanisms in osteoarthritis (OA). Below we respond to each of the issues raised.

As correctly indicated by Gentzel, the aim of our article was to emphasize the role of the hyperexcitability of the central nervous system (or central sensitization [CS]) on pain in patients with OA rather than updating the readers with our current understanding of OA etiology and joint pathophysiology. Considering both peripheral and central aspects for a comprehensive approach to OA pain does not imply "ignorance" of the chronic inflammatory condition, as suggested by Genztel. As the scientific community is well informed about the pathological changes in joint structures in patients with OA, the central pain mechanisms require more attention. Our article reviewed and evaluated the existing scientific evidence addressing CS in OA pain in order to establish whether there were enough arguments to support the role of CS in chronic pain related to OA. To cite our own article, "[i]n addition to the pathological changes in articular structures, changes in central pain processing or central sensitization appear to be involved in osteoarthritis pain."[1(p842)]

We do not doubt the role that tissue modification and destruction, typically observed in patients with OA, can have in explaining pain during the early stages of the disease. However, it is now well recognized that the central nervous system becomes hyperexcitable as pain is prolonged in time. This hyperexcitability often implies that patients' symptoms become less associated with what is happening in the peripheral tissues, including the joints, which may explain the common observation of discrepancies between radiological changes identified in patients with OA and the degree of pain and disability[3,4] and the fact that some patients with OA show symptoms even after prosthetic substitution.[5] Nevertheless, even in a person with chronic pain, peripheral nociceptive input from the damaged joint can modulate CS, as has been shown by modulation of central hyperexcitability in patients with OA in the form of amelioration of widespread analgesia[6–8] and restoration of altered spinal reflexes[9] after implementation of different treatment modalities, mainly addressing the affected joints (eg, by joint replacements). Thus, tissues can be important even in cases of chronic, localized OA pain.

Central sensitization is not present in all patients with chronic OA pain. Moreover, we acknowledge that CS is unlikely to be the etiological mechanism in a subgroup of the OA population (chronic inflammation is not etiologic to OA either), but there is increasing evidence suggesting that the presence of CS in this OA subgroup is of clinical importance.[10–12] Probably the main goal of our article was to alert clinicians about this subgroup where CS can be the most dominant pain mechanism (ie, pain experience disproportionate to the nature and extent of injury, widespread pain distribution, generalized allodynia, and hyperalgesia). In those cases, we suggest a broader management approach, focusing treatment more on diminishing the hypersensitivity of the central nervous system than on addressing the joint dysfunctions.

We recognize that clinically categorizing patients with OA as having CS can be challenging, as no gold standard method of assessment exists. In fact, pain hypersensitivity in OA has been identified mostly within laboratory settings using equipment that is costly and not readily available to clinicians (ie, psychophysical testing with various stimuli,[13] brain imaging studies[14]). That is why we propose to use a mechanism-based model mostly based on recognition of signs and symptoms for diagnosing CS,[15] following recommendations of renowned authors in the field of pain.[16] We do not think these models are "open to too much conjecture" or can lead to "entrenching of informational cascades," as Gentzel suggests, although more evidence-based and validated clinical strategies are needed to more readily and systematically identify CS in patients with OA pain. Classification of pain in terms of mechanism should constitute a priority, considering that interventions at the peripheral tissue level (eg, surgery) are less successful when CS is suspected.[4]

The biomedical model falls short in explaining chronic musculoskeletal pain.[17] Despite the fact that "[s]cience is busy identifying the causes of many chronic disease conditions such as OA," unfortunately physical therapists continue dealing every day with people with chronic pain due to OA. So, in the same way Gentzel reflected on the relevant question of at what point of tissue degradation does OA become incurable, we suggest an alternative question: At what point in time does the transition from acute to chronic OA pain occur? In other words: when CS develops in patients with OA pain, will it still be possible to reverse the situation, or will this be less

likely? There is evidence showing sensitization occurring in people with subacute musculoskeletal pain[18] and evidence pointing to the ability of CS to modulate the transition from acute to chronic pain.[18,19] In addition, CS has been shown to mediate the effects of interventions applied to peripheral tissues.[4]

As has been pointed out by Dieppe and Lohmander,[19] OA joint damage may be associated with clinical problems, but the severity of joint disease is only weakly related to that of the clinical problem. They stated that clinicians dealing with OA are faced with a complex interaction between local events in the joint, pain sensitization, the cortical experience of pain, context (ie, psychosocial, economic, and other factors), and what people are doing in their everyday lives.[19] Therefore, we should move on our thinking and broaden our view from only addressing joint dysfunctions to a more comprehensive approach addressing the brain, the central pain mechanisms, and the biopsychosocial model applied to chronic OA pain.[17]

We think Gentzel's criticism of our use of the term "might" or "may" throughout the text is not justified because our article was intended to be a proposal for chronic pain management in patients with OA, and not a statement of fact. He also alerts us that animal models of musculoskeletal pain do not closely mirror the human condition.[20] Indeed, we know pain is a complex, multidimensional, personal, and subjective experience that only humans can express.[21] However, curiously, little attention to psychosocial aspects of human OA pain was detected in Gentzel's reasoning, as addressing "basic malfunctions of normal physiology" was stated to be one his main end purposes.

In conclusion, it is key for physical therapists to acknowledge that an important subgroup of patients with OA develop hyperexcitability of the central nervous system and that CS plays a crucial role in the pain reported by these patients. Recent studies published in well-respected journals support our arguments.[22–25]

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Correction

Quinn L, Khalil H, Dawes H, et al; for the Outcome Measures Subgroup of the European Huntington's Disease Network. Reliability and minimal detectable change of physical performance measures in individuals with pre-manifest and manifest Huntington disease. *Phys Ther.* 2013;93:942–956.

In Appendix 3 of this article published in the July 2013 issue of **PTJ**, the testing protocol for the Sharpened Romberg test with eyes open is described incorrectly. The correct description is:

> (3) *Sharpened Romberg test–eyes open:* Each participant should stand on a level surface wearing flat shoes with his or her feet aligned in a strict tandem heel-to-toe position, arms crossed over the chest, and the open palm of the hand falling on the opposite shoulder. Once stable, the participant should attempt to maintain that position for 30 seconds. If the participant fails to maintain the position by movement of either arms or feet, the time taken to failure should be noted.

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