

Title: Aquatic Therapy - neurophysiology of persistent pain

Presenters: Oliver Krouwel MSc, University of Brighton, United Kingdom and Ben Waller PhD, JAMK University of Applied Sciences, Jyväskylä, Finland

AIM: We intend to translate recent advances in pain science into a patient centred evidence-based approach in the aquatic environment. The webinar will be beneficial for all clinicians working with people who are in pain as well as clinicians looking for new ideas on how to structure their aquatic therapy treatments. Discussions will not only be focused towards managing people with long term chronic (persistent) pain but also provide advice and suggestions on general management for acute injuries and how to identify risk factors early that could lead to them becoming chronic.

DESCRIPTION: Pain is a strong motivator for people to seek help. The primary aim of a clinician is to improve patient outcomes with decreasing pain often the main desired outcome.

Evidence-based clinical reasoning is the basis practitioners use to decide on the most appropriate treatment techniques for their patients combining scientific knowledge, clinical experience and the participants' beliefs and expectations. The research and thus knowledge in the field of pain neuroscience is growing quickly at the moment and it is impossible that all clinician can have the full knowledge of an individual's presentation. This webinar intends to discuss and synthesis current neurophysiology of pain processing thus giving the clinician knowledge they can use when planning a treatment for a participant with pain.

In Aquatic Therapy there is not a lot of research specifically looking at mechanisms of pain relief and many of the therapeutic effects of immersion have remained the same for several decades despite the advances in pain neuroscience. The proposed pain-relieving effects of immersion has been considered to be through the direct influence of immersion on the body and widely accepted mechanisms for pain relief in the pool include:

- Reduced loading on the joints will reduce and individuals' pain when immersed in water thus allowing them to exercise without the usual pressure through their joints. This relies on the hypothesis that an individual's pain is solely related to the mechanical loading through their joints.
- In a warm water pool, it is reasonable to conclude that muscles will relax. If the muscle is in spasm or an individual's primary pain is muscular related then this of course is a helpful effect of warm water immersion. But does this explain the instant change in pain experienced during immersion?
- The shift in fluid from extremities to the torso and increased kidney function are well documented and while often removal of inflammatory markers from area of pain has been hypothesised as a reason it is unrealistic to think this can happen instantaneously.
- Mechanoreceptors are stimulated by the mechanical pressure of the water and temperature changes. This stimulates the pain gate where Mechanoreceptors inhibit nociceptor activity thus causes a pain-relieving effect. This however does not account for a pain-relieving effect when not immersed.

These well-known pain-relieving effects of immersion are valid today, however, we have new knowledge based on recent findings from neuroscience that recognises the multifactorial nature of pain and has led to questioning of the mechanisms behind pain management in aquatic therapy.

It is time to update. Pain is a sensation like it or not! The sensation of pain is communicated through the nervous system and is influenced by many things both physically and psychologically. These

physical and psychological influences adapt and change the sensation of pain at a cellular level. These can all be affected by immersion in warm water even before movement takes place. With all the advances it can be difficult to see how pain science expressed in the cellular level translates into holistic care of the patient, especially within the pool. There is a lot of evidence in pain management that transcends specific treatment techniques or modalities and are certainly relevant to aquatic therapy practitioners. In the absence of specific evidence, we will attempt to make common sense comparisons to land based management strategies considering the known physiological effects of the aquatic environment. This webinar intends to synthesis this neuroscience into a format that clinicians can explain to patients and direct aquatic therapy treatment methods.

The presenters have a mix of theoretical academic knowledge and over 10 years of clinical experience in pain management. They will bring their clinical experience into the Webinar to help explain key concepts and discuss management options. For balance the presenters will discuss patients who have not had successful outcomes as well as those who made good progress. This honesty will hopefully help practitioners understand the complexities and multifactorial nature of pain.