# Altered anterior insula activation during anticipation and experience of painful stimuli...

Posted At : October 27, 2012 6:00 PM | Posted By : Tim Brunson, PhD
Related Categories: Meditation
Full title: Altered anterior insula activation during anticipation and experience of painful stimuli in expert meditators.

Experientially opening oneself to pain rather than avoiding it is said to reduce the mind's tendency toward avoidance or anxiety which can further exacerbate the experience of pain. This is a central feature of mindfulness-based therapies. Little is known about the neural mechanisms of mindfulness on pain. During a meditation practice similar to mindfulness, functional magnetic resonance imaging was used in expert meditators (>10,000h of practice) to dissociate neural activation patterns associated with pain, its anticipation, and habituation. Compared to novices, expert meditators reported equal pain intensity, but less unpleasantness. This difference was associated with enhanced activity in the dorsal anterior insula (aI), and the anterior mid-cingulate (aMCC) the so-called 'salience network', for experts during pain. This enhanced activity during pain was associated with reduced baseline activity before pain in these regions and the amygdala for experts only. The reduced baseline activation in left aI correlated with lifetime meditation experience. This pattern of low baseline activity coupled with high response in aIns and aMCC was associated with enhanced neural habituation in amygdala and pain-related regions before painful stimulation and in the pain-related regions during painful stimulation. These findings suggest that cultivating experiential openness down-regulates anticipatory representation of aversive events, and increases the recruitment of attentional resources during pain, which is associated with faster neural habituation.

Neuroimage. 2012 Sep 19. pii: S1053-8119(12)00940-8. doi: 10.1016/j.neuroimage.2012.09.030.
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