

Doctors learn to control their own brains' pain responses to better treat patients

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Physicians apparently learn to “shut off” the portion of their brain that helps them appreciate the pain their patients experience while treating them and instead activate a portion of the brain connected with controlling emotions, according to new research using brain scans at the University of Chicago.

Because doctors sometimes have to inflict pain on their patients as part of the healing process, they also must develop the ability to not be distracted by the suffering, said Jean Decety, Professor in Psychology and Psychiatry at the University and co-author of “Expertise Modulates the Perception of Pain in Others,” published in the Oct. 9 issue of *Current Biology* and available Thursday at noon on-line.

“They have learned through their training and practice to keep a detached perspective; without such a mechanism, performing their practice could be overwhelming or distressing, and as a consequence impair their ability to be of assistance for their patients” said Decety, who conducted the study with Yawei Cheng of the Institute of Neuroscience, National Yang-Ming University in Taipei, and colleagues there.

Previous research, including work from Decety’s lab, has shown that the neural circuit that registers pain, is activated if a person sees another person in pain. The response in this circuit, which includes the anterior insula, periaqueducal gray and anterior cingulate cortex, is automatic and may reflect a panic response developed evolutionally as a means of

avoiding danger.

The research by Decety and the Taiwanese team shows for the first time that people can learn to control that automatic response.

The team performed its research in Taiwan with two groups of evenly matched men and women with a mean age of 35 and similar socio-economic and educational levels-- a group of 14 physicians and 14 people with no experience in acupuncture. They were tested using a functional MRI.

Brain responses were recorded as individuals from the two groups looked at short video-clips in which people were pricked with acupuncture needles in their mouth regions, hands, and feet. They also watched as the patients were touched with Q-tips. The images appeared in random order.

Among the control group, the scan showed that the pain circuit, which comprises somatosensory cortex, anterior insula, periaqueducal gray and anterior cingulate cortex, was activated when members of that group saw someone touch with a needle but not activated when the person was touched with a Q-tip.

Physicians registered no increase in activity in the portion of the brain related to pain, whether they saw an image of someone stuck with a needle or touched with a Q-tip. However, the physicians, unlike the control group, did register an increase in activity in the frontal areas of the brain--the medial and superior prefrontal cortices and the right temporoparietal junction. That is the neural circuit that is related to emotion regulation and cognitive control.

They also asked the two groups to rate the level of pain they felt people were experiencing while being pricked with needles. The control group rated the pain at about 7 points on a 10-point scale, while the physicians said the pain was probably at 3 points on that scale.

Those findings reflected the prediction the scholars had going into the study.

“It would not be adaptive if this automatic sharing mechanism for pain was not modulated by cognitive control. Think, for instance, of the situations that surgeons, dentists, and nurses face in their everyday professional practices. Without some regulatory mechanism, it is very likely that medical practitioners would experience personal distress and anxiety that would interfere with their ability to heal,” the researchers write.

For Decety, this new study also casts light on the mechanisms involved in empathy and empathic concern. The former relies on our capacity to share emotions and feelings with others. If there is too much of an overlap between others and self, such an overlap (reflected by similar neural circuits that automatically and unconsciously resonate between self and other) it could lead to personal distress, which is an aversive reaction. Empathic concern necessitates to regulate our implicit sharing mechanism and frees up processing capacity to act for the sake of the other.

Source: University of Chicago

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