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Inferences on the role of proprioception for perception and action by studying deafferented patients

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Proprioception, the sense of position and movement of body segments, may not be known as much as other senses such as vision or audition. However, since the pioneer work of Sherrington, the critical role of proprioception in motor control has been increasingly highlighted. In particular, studies of human subjects massively deprived of proprioception after a viral infection, have largely demonstrated their inability to coordinate their actions. This typically results in an inability to stand and walk, we focus here on the ability of deafferented patients to control their upper-limb movements. We will first present studies that provided striking evidence for the role of proprioception in movement coordination before presenting our recent work on the role of proprioception in motor learning and how the loss of large somatosensory fibres may affect visual perception.

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Neuromuscular reorganization after arm amputation revealed by stump EMG evoked by different phantom movements

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Introduction.—Following stroke, patients frequently demonstrate loss of motor control and function and altered kinematics of reaching movements (decreased velocity, loss of smoothness and loss of inter-joint coordination). Recent clinical observations using rehabilitation technology suggest that active training may reduce impairment thanks to motor learning. One method to promote motor learning is movement sonification. In this framework, we are exploring the poten-