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Neurophysiological basis of rehabilitation of adolescent idiopathic scoliosis.

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BACKGROUND: Knowledge on mechanisms of neurophysiological control of trunk movement and posture could help in the development of rehabilitation programs and brace treatment in adolescent idiopathic scoliosis (AIS). **AIMS:** Reviewing up-to-date research on neurophysiology of movement and posture control with the aim of providing basis for new researches in the field of AIS rehabilitation and background understanding for clinicians engaged in management of AIS. **METHODS:** Review of literature. **RESULTS:** We considered several neurophysiological issues relevant for AIS rehabilitation, namely, the peculiar organization of patterns of trunk muscle recruitment, the structure of the neural hardware subserving axial and arm muscle control, and the relevance of cognitive systems allowing mapping of spatial coordinates and building of body schema. **DISCUSSION AND CONCLUSION:** We made clear the reason why trunk control is generally carried out by means of very fast, feedforward or feedback driven patterns of muscle activation which are deeply rooted in our neural control system and very difficult to modify by training. We hypothesized that augmented sensory feedback and strength exercises could be an important stage in a rehabilitation program aimed at hindering, or possibly reversing, scoliosis progression. In this context we considered bracing not only as a corrective biomechanical device but also as a tool for continuous sensory stimulation that could help awareness of body misalignment. Future research aimed at developing strategies of trunk postural control learning is essential in the rehabilitation of adolescent idiopathic scoliosis.

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