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Instrumental measures of spinal function: is it worth? A state-of-the art from a clinical perspective

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Abstract

In the last decades, assessment of trunk posture and motion has gained importance in clinical practice, and several instrumental non-invasive techniques have been developed to overcome limitations of manual and radiological methods. Despite the large effort spent in improving the underlying technologies, the actual role of these measures in the clinical setting remains still undefined due to a variety of issues. The main question concerns the provision of parameters providing a significant contribution to the clinical decision making. In this paper, we review the available spine surface measurement techniques from a technical viewpoint, and point out their current and potential applications according to a clinical perspective. Conclusions are drawn on the basis of both the technical features and accessibility in daily clinical practice, as well as of the validity, reliability and clinical value of the provided parameters. A well-defined clinical role is established for surface topography in the follow-up of spine sagittal plane deformities, adulthood scoliosis and spine disorders involving the spino-pelvic alignment. Conversely, further studies are required to identify reliable key parameters for use in the clinical (adolescent scoliosis, back and neck pain), occupational (measurement of spine exposure to mechanical loads) and forensic (assessment of segmental functional impairments) fields.