

## Special Issue

# Current Challenges and Innovations in Spine Deformity: Biomechanics, Imaging and AI-Driven Analysis

### Message from the Guest Editor

Spinal and cervical deformities remain complex challenges in modern spine surgery. However, recent developments in artificial intelligence (AI) and medical imaging offer new opportunities for refining spinal deformity assessment and enhancing surgical planning. This Special Issue aims to explore the intersection of biomechanics, imaging, and AI-driven analysis in spinal deformity research, with a particular focus on both spinal and cervical deformities. Topics of interest include, but are not limited to, posture-related spinal and cervical alignment changes, the role of imaging modalities in deformity classification, AI-based phenotyping and prediction models, and novel surgical approaches guided by computational analysis. Contributions integrating clinical, radiographic, and computational methodologies are particularly encouraged. By bringing together multidisciplinary research efforts, this Special Issue seeks to address key challenges in spinal and cervical deformity management, improve diagnostic accuracy, and advance personalized treatment strategies.

### Guest Editor

Dr. Dong-Ho Kang

Department of Orthopedic Surgery, Spine Center, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul 06351, Republic of Korea

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*Journal of Clinical Medicine*  
Editorial Office  
MDPI, Grosspeteranlage 5  
4052 Basel, Switzerland  
Tel: +41 61 683 77 34  
[jcm@mdpi.com](mailto:jcm@mdpi.com)

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