

PLENARIES

PLENARY 3: Revolutionizing Physiotherapy Practice Through AI-Based Postural Assessment and 3D Posture Analysis

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Artificial intelligence (AI) and three-dimensional (3D) technologies are creating new opportunities to enhance physiotherapy assessment through objective, quantitative, and data-driven analysis of posture and movement. Conventional postural assessment commonly relies on visual observation and manual measurements, which may be influenced by clinician experience and can present challenges in standardisation, reproducibility, and longitudinal monitoring. AI-based postural assessment and 3D posture analysis offer potential approaches to address these limitations by providing quantifiable information to support clinical assessment and decision-making.

AI-powered technologies can facilitate automated identification and quantification of postural alignment, asymmetries, and movement characteristics. The integration of 3D analysis provides multidimensional information on body alignment and movement that may complement conventional two-dimensional assessment. Such technologies can support standardised assessment, objective documentation, monitoring of changes over time, visualisation of clinical findings, and communication of assessment outcomes among clinicians and patients.

Successful implementation within physiotherapy practice requires consideration of technological validity, reliability, usability, accessibility, data interpretation, and integration into existing clinical workflows. Importantly, technological outputs should be interpreted within the context of comprehensive clinical assessment and individual patient presentation. AI and 3D technologies should therefore complement, rather than replace, physiotherapists' clinical expertise, reasoning, and patient-centred decision-making.

The integration of AI-based postural assessment into physiotherapy practice has the potential to shift posture analysis from predominantly subjective observation towards objective, reproducible, clinically meaningful, and actionable assessment, supporting more informed treatment planning, outcome monitoring, and patient-centred care.