8th Rehabilitation Conference on Motion Analysis and Spinal Disorders with Practical course

Thursday November 19 2026 Amphitheater University Hospital of Ioannina

Overall Educational Objectives of the Symposium

By the end of this symposium, participants will be able to:

1. Explain the biomechanical principles underlying normal and pathological spinal movement.
2. Understand the capabilities and limitations of contemporary motion analysis technologies.
3. Interpret quantitative biomechanical data from gait analysis, motion capture, EMG, force plates, and wearable sensors.
4. Integrate objective movement analysis into the diagnosis and management of spinal disorders.
5. Apply motion analysis findings to surgical planning, postoperative assessment, rehabilitation, and return-to-function decisions.
6. Develop personalized rehabilitation strategies using objective biomechanical biomarkers.
7. Recognize emerging technologies, including markerless motion capture, wearable sensors, artificial intelligence, and digital biomarkers, that will drive the future of precision spine care.

Round table Basic Principles (G. Sapkas, I. Gelalis)

1. Biomechanics of the Spine: From Research to Clinical Practice (Dimitios Varvarousis)

   Learning Objectives

   By the end of this presentation, participants will be able to:

- Explain the biomechanical principles governing spinal motion, stability, and load transmission.
- Interpret how alterations in spinal biomechanics contribute to common spinal disorders.
- Apply biomechanical concepts to improve clinical decision-making, surgical planning, and rehabilitation strategies.

2. Principles of Motion Analysis in Spine Assessment (Ioannis Giakas)

   Learning Objectives

   By the end of this presentation, participants will be able to:

- Describe the fundamental components of a clinical motion analysis laboratory, including motion capture, force plates, EMG, and wearable technologies.
- Interpret kinematic, kinetic, and neuromuscular data obtained during functional movement assessment.
- Recognize the strengths, limitations, and clinical applications of quantitative motion analysis in spine evaluation.

3. Wearable Sensors and Digital Tools in Spine Rehabilitation (Dimitrios Dimopoulos)

   Learning Objectives

   By the end of this presentation, participants will be able to:

- Identify current wearable technologies used for monitoring spinal function and physical activity.
- Explain how digital biomarkers can objectively assess rehabilitation progress.
- Integrate wearable sensor data into individualized rehabilitation and remote patient monitoring programs.

4. Spinal deformities and gait disturbances (Georgios Sapkas)

Learning Objectives

By the end of this presentation, participants will be able to:

- Describe dynamic movement impairments associated with spinal deformities beyond static radiographic evaluation.
- Interpret motion analysis parameters related to trunk symmetry, gait, and postural control.
- Apply objective movement analysis to guide treatment planning and monitor rehabilitation outcomes.

5. Cervical Spine Disorders and Movement Patterns (Sofia Xergia)

Learning Objectives

By the end of this presentation, participants will be able to:

- Recognize movement alterations associated with common cervical spine disorders.
- Interpret cervical kinematic and neuromuscular assessment findings during functional activities.
- Utilize objective movement analysis to support clinical evaluation and rehabilitation planning.

Round table Clinical Applications-Rehabilitation (Alexandros Beris, Anastasios Korompilias)

6. Gait Analysis and Spinal Alignment: What Can We Learn? (Panagiotis Koulouvaris)

Learning Objectives

By the end of this presentation, participants will be able to:

- Explain the relationship between spinal alignment and gait mechanics.
- Interpret objective gait parameters associated with spinal deformity and degenerative disorders.
- Incorporate gait analysis findings into clinical evaluation and treatment planning.

7. Motion Analysis in Low Back Pain: Clinical Applications (George Vasileiadis)

Learning Objectives

By the end of this presentation, participants will be able to:

- Identify biomechanical movement impairments associated with chronic low back pain.
- Interpret objective functional assessments to classify movement dysfunction.
- Utilize motion analysis findings to optimize rehabilitation and monitor treatment response.

8. Motion Analysis Before and After Spine Surgery (Avraam Ploumis)

Learning Objectives

By the end of this presentation, participants will be able to:

- Compare objective functional performance before and after spine surgery.
- Interpret quantitative biomechanical measures of surgical recovery.
- Incorporate motion analysis into postoperative evaluation and rehabilitation progression.

9. Motion Analysis in Neurological Conditions Affecting the Spine (Georgios Gkrimas)

Learning Objectives

By the end of this presentation, participants will be able to:

- Recognize gait and balance abnormalities associated with neurological disorders affecting spinal function.
- Interpret quantitative measures of postural stability, gait variability, and neuromuscular control.
- Apply motion analysis findings to rehabilitation planning and longitudinal patient monitoring.

10. Translating Motion Analysis Findings into Rehabilitation Program (Ram Haddas)

Learning Objectives

By the end of this presentation, participants will be able to:

- Interpret motion analysis reports to identify patient-specific biomechanical impairments.
- Develop individualized rehabilitation programs based on objective movement deficits and functional limitations.
- Utilize quantitative biomechanical outcomes to monitor recovery, guide progression, and support return-to-function decisions.

12 min Presentation

20 min Discussion

Practical Course (Avraam Ploumis-Ram Haddas) (At the Gait Analysis Lab of the Department of Physical Medicine and Rehabilitation)

1. Basic knowledge on motion analysis (Dimitrios Dimopoulos-Dimitrios Varvarousis) 60'

Learning Objectives

By the end of this workshop, participants will be able to:

- Understand the workflow of a clinical motion analysis laboratory.
- Demonstrate the basic principles of motion capture, force plate, and EMG data collection.
- Recognize essential quality control procedures for acquiring reliable biomechanical data.

2. Future Directions in Digital Spine Assessment and Rehabilitation (Ram Haddas-Avraam Ploumis) 60'

Learning Objectives

By the end of this workshop, participants will be able to:

- Describe emerging technologies including markerless motion capture, wearable sensors, artificial intelligence, and digital biomarkers.
- Evaluate the potential of digital technologies for precision spine care and remote patient monitoring.
- Discuss future clinical applications and implementation strategies for digital rehabilitation platforms.

3. Personalized Rehabilitation Program Based on Motion Analysis Findings (Ioannis Giakas-Sofia Xergia) 60’

Learning Objectives

By the end of this workshop, participants will be able to:

- Interpret objective biomechanical findings from motion analysis reports.
- Design individualized rehabilitation programs targeting identified movement impairments.
- Establish objective outcome measures to monitor patient progress and optimize rehabilitation progression.

4. Scoliosis in neurologic patients: Motion Analysis for Assessment and Exercise Prescription (Georgios Gkrimas-Alexandros Athanasiou) 60’

Learning Objectives

By the end of this workshop, participants will be able to:

- Assess dynamic posture, gait, and balance impairments in patients with neuromuscular scoliosis.
- Interpret motion analysis findings to identify patient-specific functional deficits.
- Develop evidence-based exercise prescriptions and rehabilitation strategies guided by objective movement analysis.