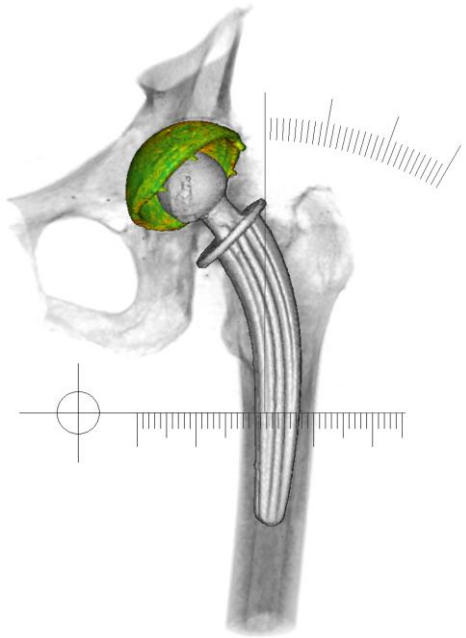
Research Summary Sectra CTMA®

Computed Tomography Micro-motion Analysis

SECTRA

Knowledge and passion

Content



Published articles using the Sectra CTMA® tool

Ankle

- Paulsen et al 2023 - CT-based radiostereometric analysis for assessing mid- foot kinematics: precision compared with marker-based radiostereometry

General

- Sandberg et al - 2023 - Computed tomography-based radiostereometric analysis in orthopedic research - practical guideline

Hip

- Brodén et al 2020 - Low dose CT based implant motion analysis is a precise tool for early migration measurements of hip cups a clinical study of 24 patients
- Eriksson et al 2019 - Are low-dose CT scans a satisfactory substitute for stereoradiographs for migration studies A preclinical test of low-dose CT scanning protocols and their application in a pilot patient
- Sandberg et al 2020 - The anatomical SP CL stem demonstrates a non-progressing migration pattern
- Stigbrand et al 2020 - Implant migration and bone mineral density measured simultaneously by low-dose CT scans/ a 2-year study on 17 acetabular revisions with impaction bone grafting
- Brodén et al 2021 - Precision of CT based micromotion analysis is comparable to radiostereometry for early migration measurements in cemented acetabular cups
- Angelomenos et al 2022 - Precision of low-dose CT-based micromotion analysis technique for the assessment of early acetabular cup migration compared with gold standard RSA: a prospective study of 30 patients up to 1 year
- Angelomenos et al 2025 - Comparison of the CT-based micromotion analysis method versus marker-based RSA in measuring femoral head translation and evaluation of its intra- and interobserver reliability: a prospective agreement diagnostic study on 27 patients up to 1 year

Knee

- Wretenberg et al 2021 - Implant Movement Analysis (IMA), A New CT based technique for diagnosis of aseptic loosening of total knee arthroplasty
- Engseth et al - 2023 - CT-based migration analysis is more precise than radio-stereometric analysis for tibial implants a phantom study on a porcine cadaver
- Øhrn et al 2023 - Dose reduction does not impact the precision of CT-based RSA in tibial implants: a diagnostic accuracy study on precision in a porcine cadaver
- Engseth et al 2025 - CT-based migration analysis of a tibial component compared to radiosteriometric analysis

Shoulder

- Brodén et al 2019 - Accuracy and precision of a CT method for assessing migration in shoulder arthroplasty: an experimental study
- Brodén et al 2022 - CT-based micromotion analysis method can assess early implant migration and development of radiolucent lines in cemented glenoid components: a clinical feasibility study
- Spek et al 2024 - Pre-operative virtual three-dimensional planning for proximal humerus fractures: A proof-of-concept study

Spine/SI-joint

- Olivecrona et al 2024 - Assessment of the sacroiliac joint with computed tomography motion analysis - a diagnostic study of 12 patients

Trauma

- Bakhshayesh et al 2019 - A New CT Based Method for Post-operative Motion Analysis of Pelvic Fractures
- Bakhshayesh et al 2019 - Volume fusion of CT images to measure femoral symmetricity
- Bakhahayesh et al 2020 - A novel 3D technique to assess symmetry of hemi pelvises
- Bakhshayesh et al - 2021- A novel technique to assess rotational deformities in lower exteremeties using CT-based motion analysis
- Lundin et al 2023 - Computed tomography micromotion analysis in the follow-up of patients with surgically treated pelvic fractures: a prospective clinical study
- van der Gaast et al 2023 - Quantifying the Differences between 3D Virtual Planning and Attained Postoperative Reduction on CT for Patients with Tibial Plateau Fractures - a Clinical Feasibility Study
- Spek et al 2024 - Pre-operative virtual three dimensional planning for proximal humerus fractures - a proof-of-concept study

Wrist

- Schriever et al 2019 - Triquetral Motion Is Limited *In Vivo* After Lunocapitate Arthrodesis
- Schriever et al 2021 - There is motion between the scaphoid and the lunate during the dart-throwing motion
- Lundqvist et al - 2023 - CT-Based Micromotion Analysis After Locking Plate Fixation of AO Type C Distal Radius Fractures
- Angelomenos et al - 2024 - Comparison of Marker-Based RSA and CT-RSA for Analyzing Micromotions After Distal Radius Osteotomy: A 1-Year Retrospective Study of 24 Patients
- Reiser et al - 2025 - CT Motion-Analysis of Implant Loosening in Total Wrist Arthroplasty - A Pilot Study

A choice of ongoing clinical studies using the Sectra CTMA® tool (estimated publication date within brackets)

- Comparison to RSA in 2 separate total knee arthroplasty studies precision (2023)
- Comparison to RSA, 5 years follow up in 10 primary hips (2023)
- Comparison to RSA in CB-CT 1 year follow up on 24 patients on distal radius osteotomies
- 1 year follow up on cervical anchored cages (2023)

Sectra currently has research co-operations with more than 10 universities in Europe, North America and Australia.

A choice of relevant literature on the underlying principle of using multiple CT:s to measure implant movement (these are not using Sectra CTMA®)

- Berger et al 1996 - Dynamic test to diagnose loose uncemented femoral total hip components
- Brodén et al 2016 - Accuracy and Precision of Three-Dimensional Low Dose CT Compared to Standard RSA in Acetabular Cups: An Experimental Study
- Olivecrona et al 2008 - A new technique for diagnosis of acetabular cup loosening using computed tomography: Preliminary experience in 10 patients
- Olivecrona et al 2016 - A CT method for following patients with both prosthetic replacement and implanted tantalum beads: preliminary analysis with a pelvic model and in seven patients
- Otten et al 2017 - Are CT Scans a Satisfactory Substitute for the Follow-Up of RSA Migration Studies of Uncemented Cups? A Comparison of RSA Double Examinations and CT Datasets of 46 Total Hip Arthroplasties
- Reinus et al 1996 - Evaluation of Femoral Prosthetic Loosening Using CT Imaging
- Scheerlink et al 2015 - Development and validation of an automated and marker-free CT-based spatial analysis method (CTSA) for assessment of femoral hip implant migration In vitro accuracy and precision comparable to that of radiostereometric analysis (RSA)
- Svedmark et al 2015 - A New CT Method for Assessing 3D Movements in Lumbar Facet Joints and Vertebrae in Patients before and after TDR Acquiring images

More information about CTMA can be found on:

https://sectra.com/medical/product/sectra-ctma/