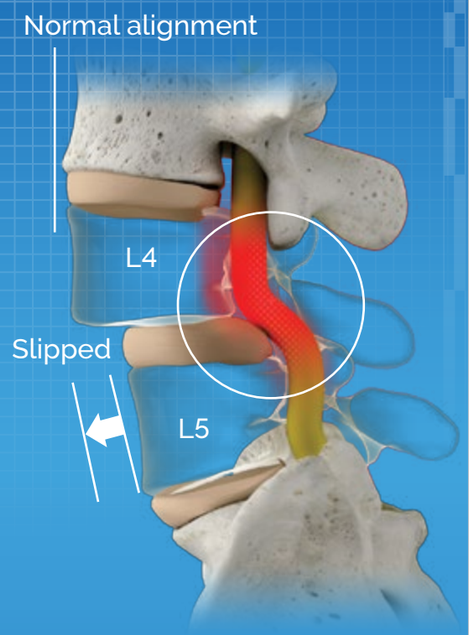

Spinal instability

When vertebral bodies slip, nerves can be impinged, which can lead to symptoms, such as pain.

Some instability occurs only during spine bending. Flex-ex testing involves uncontrolled bending, so patients can avoid painful positions that trigger instability. This can prevent a surgeon from ever knowing instability is present.

With VMA testing, hardware gently guides patient bending to help achieve positions that result in the detection of instability. This is how VMA testing doubles the rate of lumbar radiographic instability detection vs. flex-ex testing[1].

A New Standard in Spine Diagnostic Imaging

Easily integrated into your clinical workflow

Imaging is done with standard surgical C-arms (fluoroscopes), typically requiring no new staff or imaging machines and a day or two of training. VMA testing takes about 5 minutes more than a 15 minute flex-ex.

The VMA system is HIPAA-compliant, is browser-based, has a "zero IT footprint" requiring no installed software, and easily integrates with PACS systems.

VMA offers more robust data with less radiation than a flex-ex[3]. This means lower exposures may be possible for both the patient and technologist.

[3] As a fluoroscopy based test, the VMA presents opportunities to reduce radiation exposure to the patient as compared to plain x-rays, which involve a much higher per-image dose of radiation. See Mellor, FE et. al. "Moving back: The radiation dose received from lumbar spine quantitative fluoroscopy compared to lumbar spine radiographs with suggestions for dose reduction." Radiography. Vol. 20, Issue 3, pp. 251–257, Aug. 2014.

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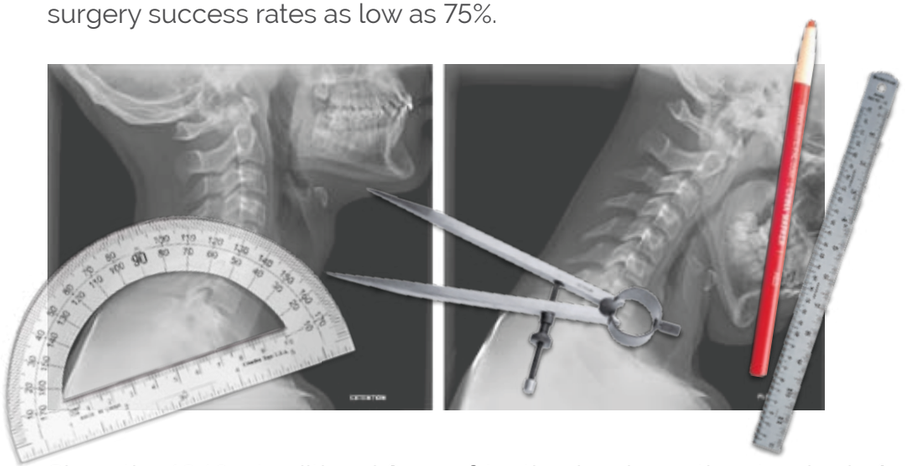
Vertebral Motion Analysis (VMA) is the first new quantitative spine imaging test in over 75 years.

EKG. Treadmill stress testing. Echocardiograms. Angiography. Cardiologists enjoy several advanced functional diagnostic technologies, enabling them to achieve surgery success rates well over 95%. However spine surgeons have a very limited set of diagnostic tools, contributing to surgery success rates as low as 75%.



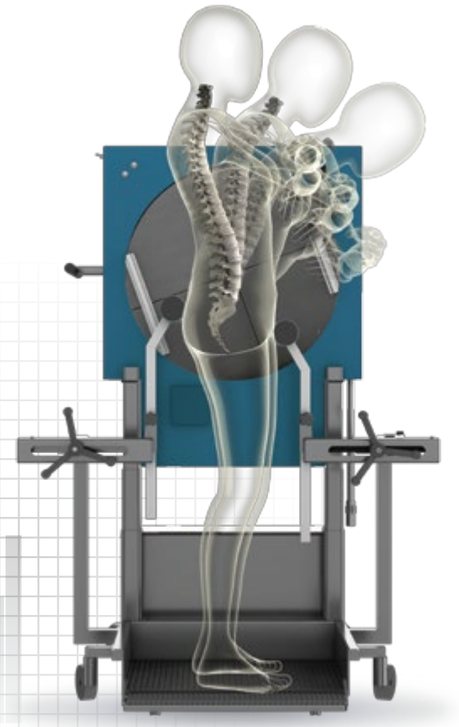
Since the 1940s, traditional flex-ex[2] testing has been the standard of care for assessing instability based on spine motion analysis. Flex-ex testing requires physicians to measure spine motion from x-rays by hand. Results are highly variable, but because flex-ex data is so important, it is still ordered over 5 million times each year in the US—more than spine CT and MR imaging combined.

We believe patients and surgeons deserve better.

Introducing VMA, advanced functional imaging for the lumbar and cervical spine

VMA testing helps patients overcome the "guarding" that can occur during painful spine bending, enabling more patients to demonstrate evidence of spinal instability. The result is that VMA testing is 500% more sensitive in detecting lumbar radiographic instability as compared to flex-ex testing, but just as specific[1].

VMA testing involves standard surgical C-arms to capture moving "video x-ray"-type images. Images are uploaded to VMA online servers, where they are processed to produce spine motion measurements used to assess spinal instability. VMA's cloud-based system provides access to images and test results via any internet-connected computer, tablet, or smartphone. VMA provides online surgeon tools that make consulting with patients and interacting with insurance companies much easier.



- 500% more sensitive than today's current test in detecting lumbar radiographic instability, but just as specific[1]
- Detects double the rate of lumbar radiographic instability[1] as compared to traditional flex-ex testing
- Validated in the largest Level 1 Evidence study of its kind[1]

[1] Based on a threshold for dynamic lumbar slip of 5.3 mm or 15% of vertebral body depth. In a "head-to-head" study of 870 consecutive spine surgical clinic patients and 240 pain-free controls, lumbar radiographic instability was detected in 11.5% of patients and only 0.5% of pain-free controls. For comparison, traditional flexion/extension bending x-rays detected lumbar radiographic instability in only 5.5% of the patient population and 0.5% of the pain free controls. Data on file with Ortho Kinematics, Inc.

[2] The term "flex-ex" refers to standard lumbar or cervical x-rays of spine flexion (forward) and extension (backward) bending.

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www.orthokinematics.com

Use of the VMA
VMA is designed for clinical professionals who are interested in the analysis of motion in medical images, particularly in musculoskeletal images of the spine. VMA facilitates quantitative assessment of vertebral motion in digital medical images. Please see **www.orthokinematics.com/pubs/vma-indications-for-use.html** for full Indications for Use.