

General Questions

These are designed to be general answers to general questions.

Q: What is x-ray digitization or as it is commonly called today; CRMA (Computerized Radiographic Mensuration Analysis)?

A: Both are the same, CRMA is the more contemporary term. CRMA stands for Computerized Radiographic Mensuration Analysis. This is the most accurate way to determine intersegmental motion patterns, both normal and abnormal.

Q: What is “Alteration of Motion Segment Integrity” or “Loss of Motion Segment Integrity” (LMSI)?

A: Loss of Motion Segment Integrity occurs when you have measured ligament (laxity, instability, sub-failure) to an injured spine that meets the AMA Impairment Guides Measured Criteria. When a ligament that holds the spine together is damaged you lose the integrity of the motion segment and it slips in translation or it opens up too much in angular variation. These are defined and can be accurately and reliably measured using computer assistance. Here is what the AMA says about it:

Loss of Motion Segment Integrity, TRANSLATION: Refers to the measured A-P movement of one vertebral body compared to its adjacent vertebral body in flexion vs. extension (lateral view).

Loss of Motions Segment Integrity, ANGULAR VARIATION: Refers to the difference in endplate angles measured in flexion.

The A.M.A. Guides to the Evaluation of Permanent Impairment, 5th Edition 2001, states that the following are the determining measurements, which when met or exceeded qualify for a DRE Category IV, which is assigned a Whole Person Impairment of 25% to 28%.

- n Translation is defined as antero-posterior motion of one vertebra over another that is:
 - n >3.5 mm in cervical spine
 - n >2.5 mm in thoracic spine
 - n >4.5 mm in lumbar spine
- n Angular motion difference of two adjacent segments

- n >11 deg Cervical spine
- n >15 deg at L1-L2, L2-L3 & L3-L4
- n >20 deg at L4-L5
- n >25 deg at L5-S1

These same Guides tell us that:

“Motion of individual spine segments cannot be determined by physical examination but is evaluated with flexion extension roentgenograms” pg. 379 AMA Guides

“When routine x-rays are normal and severe trauma is absent, motion segment alteration is rare; thus, flexion and extension x-rays are indicated *only* when the physician suspects motion segment alteration from history or findings on routine x-rays.” Pg. 379 AMA Guides

Q: What is the clinical benefit of having a service analyze my patients x-rays for “alteration of motion segment integrity”?

A: The Reason I have it done is to clinically assist me in analyzing the degree of insult or trauma to the spinal ligaments. The spine has bone, muscle, nerve, and ligament that may be injured in an accident or trauma. Most doctors are very good at assessing damage to the bone, muscle and nerve, but virtually have no diagnostic work up for the spinal ligaments. As we all know the ligament tissue is the most debilitating tissue to damage. When ligaments are damaged the condition is usually permanent and progressive either now or both now and in the future. This can cause a lot of pain, both acute and chronic as well as other neurological consequences. This test allows me to objectively determine the severity of the ligamentous injury so that I can determine a more appropriate treatment plan.

Q: I have been told that x-rays cannot be accurately measured because patient position can influence the measurements?

A: Your patient’s x-rays (Plain film or DMX) are one of the most objective tests that we perform on injured patients in the clinical setting. With CRMA we are looking for spinal misalignment due to ligament damage called “Alteration of Motion Segment Integrity” many times called “Loss of Motion Segment Integrity” or LMSI. On these measurements patient position either on initial films or follow up films has no bearing on the test. The beauty of this test is that the patient cannot control or influence the outcome. Flexion extension films have been called “Stress Radiography” for obvious reasons. The only criteria are good flexion and extension views with good technique so that the structures are adequately viewed. These numbers that the CRMA pick up via the AMA measurement system, we developed of the same plain films and there was a factor included to account for inaccuracies within the AMA system.

Q: I was told that x-ray magnification makes the study inaccurate?

A: The AMA has set up the criteria for abnormal vertebral position called “Alteration of Motion Segment Integrity”. The cervical translation measurements for LMSI are greater than 3.5mm of combined slippage in the cervical spine. Combined means slippage on both flexion and extension film combined. The AMA has factored in already a 30% magnification error into its numbers to account for the film magnification factors. The company that I utilize also has protocols to make sure that magnification factors are minimal and within the AMA protocol

Q: I was told that I should not take x-rays until after the first 2-4 weeks of care as spasm and inflammation can hide the findings of LMSI?

A: Each doctor has to make a decision that best supports their manner of practice. You obviously want to take your x-rays of injured patients right away as you want to see what you are dealing with, i.e. misalignments, degenerative disc disease, spinal curvature problems, compression fractures, etc. You want to locate potential problems resultant from the injury as well as complicating factors so that you can better manage your patients. Some will say to not take stress views right away (flexion extension views), and that is their choice, however may others will take flexion extension x-rays right away and the provider does have Standard of Care Chiropractic Guidelines that support it. I have treated thousands of patients and I have x-rayed the great majority of them. Flexion extension views allow you to see slippages due to ligament damage that are often missed on a neutral lateral film. Why would you not want to know that they are there right from the start and more importantly why would you want to miss them right from the start of care? I have seen large translations due to ligament damage right on the initial films that would have been missed if there were only neutral lateral film. When you see these it allows you to make better decisions as to which vertebrae you are going to adjust as well as how you want to go about active care with this patient. Lastly in today’s litigious environment I would not want to be without a full work up on any patient. Smith vs Yohe is a court case that is often cited regarding this issue:

Smith vs. Yohe, Supreme Court of Pennsylvania 10-9-63

“If a physician, as an aid to his diagnosis (i.e.: his judgment) does not avail himself of the scientific means and facilities open to him for the collection of the BEST factual data upon which to arrive at his diagnosis, the result is not an error of judgment but negligence in failing to secure an adequate factual basis upon which to support his diagnosis or judgment.”

You can never be at fault for being overly cautious as long as it is backed by good clinical rationale.

Q: Can the findings of “Alteration of Motion Segment Integrity” be hidden on initial films due to spasm and inflammation associated with the injury?

A: Yes they can, however it is not as common as some would lead you to believe and it is usually very easy to see clinically. When you take your initial set of stress radiographs, if you see that there is little flexion or little extension or you see vertebrae moving in a block and not individually, then you are probably dealing with spasm and inflammation causing this. You simply note this and let the patient know that pain, spasm and inflammation may be hiding ligament damage on the films, and that as soon as they have improved ROM, you are going to retake the films to have them tested for ligament damage and it will probably occur at our first re-exam period. You will periodically see this occurring, but not enough to stop you from doing stress radiography right away.

Q: I was told that in order to get true stress radiography to show up “alteration of motion segment integrity” it is best to have a technician press down on the patients head?

A: First of all I would not want that job as it would be a bit of a Madame Curie situation of too much exposure to x-ray for the technician. You do not need to have pressure on the patients head, however if you are a biomechanical CBP, Pettibon practitioner and you use head weights for rehab there is no problem with putting them on the patients head for the stress views.

Q: What if I shoot my cervical at 40” FFD, can I still get my X-rays Accurately Digitized?

A: Yes you simply tell us that you shoot at that FFD and we will calibrate our system to compare your 40” to the standard 72” FFD. We are the only company in the market that can do this. Now if you are going to be doing a lot of stress studies we recommend that you shoot your cervical views at 72” FFD.

Q: On my reports that are positive for “Alteration of Motion Segment Integrity” the reports state that there is a 25% Whole Person Impairment, what does that mean?

A: First of all Impairment means: *A loss, loss of use, or derangement of any body part, organ system, organ function.*

Further more:

Impairment percentages or ratings developed by medical specialist are consensus-derived estimates that reflect the severity of the medical condition and the degree that the impairment decreases and individual’s ability to perform common activities of daily living (ADL), **EXCLUDING WORK**. Impairment ratings were designed to reflect functional limitations and not disability. *Page 4 AMA Guides.*

ADLS are the following:

Table 1-2 Activities of Daily Living

ACTIVITY	EXAMPLE
Self-care, personal hygiene	Urinating, defecating, brushing teeth, combing hair, bathing, dressing oneself, eating
Communication	Writing, typing, seeing, hearing, speaking
Physical Activity	Standing, sitting, reclining, walking, climbing stairs
Sensory function	Hearing, seeing, tactile discrimination
Nonspecialized hand activities	Grasping, lifting, tactile discrimination
Travel	Riding, driving, flying
Sexual function	Orgasm, ejaculation, lubrication, erection
Sleep	Restful, nocturnal sleep pattern

So to continue when your patient has alteration of motion segment integrity (Values Defined Above) the AMA says that either now or in the future 25% of your patient's ability to perform activities of daily living will be negatively affected. This is not your professional opinion; this is the AMA's consensus opinion, as to how this condition will affect your patient's life

Q: Does an Impairment Rating have anything to do with a disability percentage?

A: No it does not directly, however you will never have a disability without an impairment.. Impairment ratings are for how the condition will affect the patient's life outside of work. Disability is how the condition will affect the individual's ability to earn a living or to work at their current job or any job for that matter. A disability exam takes into consideration the specific physical requirement of the job and matches them to any inability i.e., the patient has three herniated disc in the lumbar spine and his job requires that he lift with his low back 70 plus pounds, 60-90 times a day—there may be a disability—an inability to continue to do this job. Now all disability requires impairment, however having impairment does not necessarily mean that there is a disability;

Example: A man saws his left little finger off in the garage and it cannot be re-attached. He would have a 10% Impairment of the hand usage, 9% impairment of the upper extremity and 5% whole body impairment. This means that five percent of his activities of daily living would be negatively influenced. He may not golf well, use garden tools etc. Now if he were a right handed bank president, this injury would have no negative influence on his ability to do his job—0% Disability. However if this person was a professional pianist he may not be able to do his job at all, which would be 100% disability. I hope this helps you to understand the two terms.

Q: When I see and Impairment Rating it states based on an AMA DRE Category; what does DRE mean?

A: DRE means Diagnosis Related Estimate. There are two methods of impairment rating DRE and ROM Method. With DRE you simply look at that diagnosis or level of functional loss up on and chart and the AMA Guides book tells you how much that condition will affect your patient's life. If you cannot adequately place the patient into a DRE Category than the AMA has a ROM (Range of Motion) Method for spinal impairment, by which you take range of motion measurements of the spine. Combined with and diagnosis, such as spinal DJD, and combine this further with any spinal nerve deficit. DRE is what you will use with injured patients.

Q: Is this procedure under any set of guidelines?

A: Yes it is. It is listed in many guidelines, the ICA and CCP Guidelines to name a few.

Q: Why is this procedure needed as a means of diagnosis?

A: This procedure was utilized in order to get an accurate diagnosis of what is going on with my patient inter-segmentally, which I do not have the ability to get in my clinic, as we do not have the equipment to accurately do this. We use an outside service for one reason; accuracy in determining what the patient has so that I may make my diagnosis as accurate as possible. Accuracy of diagnosis allows me the opportunity to provide my patients with optimal outcomes from their care and it also provides me with another level of patient safety. If there is a more accurate way for me to determine spinal instability, please send me the procedure and the mechanics of utilizing it and I will consider using it in the future. Also and in conclusion too many times we see that doctors who are treating spinal sprain injuries are missing significant ligament findings. A delay in the diagnosis of these findings can lead to a delay in the recovery of the patient's health, simply because the provider did not develop the appropriate treatment plan.

Q: What are the reasons for referring the patient's plain film x-rays?

I have referred this patient's films out in order to determine the severity of any spinal ligament damage to the spine. This of course is done with an accurate and reliable intersegmental motion exam performed with CRMA. This allows me to determine the severity and the location of the patient's spinal ligament condition so that I can set up the most appropriate care plan for the patient. Severe sprain may be treated differently than say moderate or mild sprain. There may be treatment durations that are longer, activity modifications that may need to be made, work modifications, etc, all based on the results.

Q: How have the findings of the report been utilized to modify the patient's course of treatment (medical regime)?

Doctors this is a question that in some ways you must take the time to answer for yourselves as there is a great variance in both techniques and approaches and you must use yours. Perhaps you have special or more advanced active care (home exercise programs), or you have physical therapy protocols for ligaments, laser protocols, or you have nutritional protocols, or you are going to switch the vertebral levels being adjusted, or you are going to expect to need longer 3x/wk, 2x/wk care. This is up to you. Here is how I would answer this question in my own clinic.

I use this procedure to confirm or alter my treatment plan with the patient. It is painfully simple to understand that patients who have ratable levels of ligament instability have a much more serious condition than those that do not. There has been a grading system of sprains which indicate that a patient who has a ratable level of sprain, those meeting the criteria for “alteration of motion segment integrity” as laid out in the AMA Guides to the Evaluation of Permanent Impairment, would be classified as a Grade III sprain or as serious of a sprain as you can get. Sprains by definition mean that the connective tissue is damaged, in this case the ligament, which by definition maintains spinal motion unit integrity. Knowing the status of my patient’s spine allows me to better communicate with my patient and set up treatment protocols that are more appropriate for a patient with this type of sprain or ligament condition. Knowing which level is most affected allows me to make judgment as to whether or not I should be adjusting these segments or segment, which immediately alters my care plan for the patient. Ligament injury also tells me that generally this patient will require more care and more active participation in their recovery through active care procedures, such as the home exercises that they have been given. It also alerts me to be more active in coaching this patient back to recovery if they get lax on either my care plan or my active care procedures, as by definition these patients can take longer to stabilize. Knowing this information also allows me to better communicate to my patient what they have, so there is less confusion and better understanding by both myself and the patient.

My job rehabilitating patients with injuries is a tough and often very rewarding job that I take seriously, as it affects the lives of the patients that I treat. My ability to get knowledge and understanding of what I am treating with each and every patient is key, and that is why we utilize this service. It definitely makes a difference in what I am going to do with this patient. It also places this patient into a confirmed Croft treatment Guidelines Grade III because they are not showing any radicular problems. (Grade IV if they were showing neurological findings).

Q: The x-ray findings from digitizing can be determined using manual techniques. Please explain why it was necessary to refer the patient's x-rays out?

I do not mean to sound rude, but according to who this can be done as accurately manually? Who says that x-ray findings from CRMA can be determined using manual

techniques? If this were true I would simply perform them in my clinic myself. I am not an advocate of sending my patients out for unnecessary procedures just for the sake of the procedure. I take my job and my responsibility as a clinician seriously, as noted above. To explain my point further, I have attended and accredited school, and have a responsibility to obtain continuing education hours yearly in order to maintain my license. In all of this education I was never taught, nor could I perform this procedure accurately in my clinic and I am not aware of anyone else that can in private practice either as this is not a standard procedure that is taught, however CRMA and its utilization is well laid out as a valid procedure to use in our National Association Position Statements, as well as published guidelines.

I also understand that the difference between ratable and non-ratable "alteration of motion segment integrity" is in terms of hundredths of a millimeter. I simply cannot be that accurate with a x-ray pencil and a ruler. My x-ray marker line alone may be an average of 0.75 of a millimeter and I would have to draw four lines in order to calculate translation for one motion unit. This gives me three millimeters of line just with my marking pencil. There is no way I can accurately do this in my clinic.

If this procedure can be accurately performed by me in my clinic, by hand, please send me a copy of the written procedure, including how to accurately assess both angular and translational variations involved in "alteration of motion segment integrity." Please also send me testing that has proven that this method is more accurate than one using a computer with sophisticated biomechanical mensuration software, that has the ability to zoom, scroll, magnify-down to the pixel, apply gray scale filters, negative reversal filter, red, blue and green filters, noise reduction, contrast and brightness control, mirror, invert, tilt by degrees, capture frame image, image distortion calibration and rotate the axis of digital images, in order to get a highly accurate study.

I would also ask you to go one step further and call on the next ten doctors who are practicing spinal adjusting techniques which are usually either a Doctor of Chiropractic or a Doctor of Osteopathy and ask them how they calculate accurately by hand the degree of spinal instability associated in the AMA Guides as alteration of motion segment integrity? I will be willing to bet that the next 100 doctors that you would ask that question could not answer it correctly, so where does it come from that this can be done by hand in my clinic? When I talk to medical radiologists I find that they were never taught in their formal education to accurately detect spinal instability, nor do they even know the parameters by which it is determined?

Again I am not in the habit of sending my patients out for an unnecessary procedure that I could easily do in my clinic. I cannot do in my clinic the evaluation that National Injury Diagnostics provides or for that matter any other X-ray Digitization service provider.

Q: I have taken note that CPT code 76499 "An unlisted diagnostic radiographic procedure" has been billed for this procedure. The plain film x-rays were analyzed,

which included a radiographical analysis, and we have reimbursed your office for these charges. Please explain why both procedures were necessary.

I think I have fully explained to you why we utilized this service and how it is performing a diagnostic study for me that I cannot perform for myself, but need in order to better understand the patient that I am managing. This is a separate prescription service that I referred the patient out to, and I have no knowledge of their billing codes, nor does it concern me. I only know that this company provides a valuable service that allows me to get a more accurate diagnosis and allows me to better handle my patients. It also provides me with another layer of patient safety. As for the billing codes that they use you would have to take up with them, as I say I have no knowledge of their codes.

Q: You cannot see ligament damage on plain film x-rays can you?

A: No you cannot see the ligaments but you also cannot see cancer and other conditions that can be diagnosed by x-rays. You can only see the effects of cancer, by the appearance of bone wasting or modeling. You cannot see degenerative disc disease; you can only see the effect of it. Ligaments hold bones together and when those bones misalign to a certain threshold it is agreed that the ligament is impaired i.e., stretched, torn etc.

Q: When you have alteration of motion segment integrity, spinal ligament damage it cannot be treated, therefore it does not affect what you are going to do with the patient?

A: Ligamentous instability which is ratable and Called (AOMSI) Alteration of Motion Segment Integrity can most certainly be treated and stabilized. The Council on Chiropractic Practice Clinical Practice Guidelines 3rd edition, published in 2008 has listed on page 14, “impairment due to loss of motion segment integrity” “as a component of the subluxation complex.” Obviously the spinal subluxation complex and its various components are the scope of chiropractic practice and treatment. Though ligament injuries are usually permanent, the effect that they have clinically is not and can be properly stabilized through an appropriate functional recovery program.

Q: It is necessary to have a MD Radiologist sign off on the CRMA report?

A: Yes we feel it is very important to have a qualified independent third party perform the CRMA study, simply because the results can be so significant. A trained Medical Radiologist is ideal for this procedure as it is based on the American Medical Association numbers and procedures which were developed by Medical Doctors.

Q: I was told that the impairment rating is not good or considered for “alteration of motion segment integrity” unless it is done by a medical radiologist?

A: Many insurance companies do not have a place in their software for inclusion of an impairment rating in an insured’s file, other than on the Medical Side of the claim. In

other words the only place an impairment rating can get logged in is under the medical side.

Q: I was told by a reviewer that I cannot adjust a spinal instability or a spinal hypermobility?

A: In the RECOMMENDED CLINICAL PROTOCOLS AND GUIDELINES FOR THE PRACTICE OF CHIROPRACTIC put out in 2000 by the International Chiropractic Association, chapter 17 CHAPTER 17 Contraindications and Complications----page 413 states:

Articular hypermobility, and circumstances where the stability of a joint is uncertain, do not represent a **contraindication**, but may represent a **special circumstances situation in which additional examination is necessary to determine the best course of care and/or if modification is necessary** to high-velocity thrust procedures to the area of pathology.

17.2.7 Risk-of-Complication Rating:

Severity: Minimal

Condition Rating: Type I, II

Quality of Evidence: Class II, III

Acute injuries of osseous and soft tissues may require modification of chiropractic care. In most cases, high-velocity thrust procedures to the area of pathology are **not contraindicated**.

17.2.9 Risk-of-Complication Rating:

Severity: Minimal to moderate

Condition Rating: Type I, II

Quality of Evidence: Class I, II

Spinal Manipulation utilizing High Velocity Low Amplitude Thrusts Adjustments have been utilized in chiropractic for treatment of spinal instabilities for as long as these conditions have been identified. This is why the CCP Guidelines listed above listed severe Ligamentous Instability such as the AMAs Alteration of Motion Segment Integrity as a Component of the Spinal Subluxation Complex.

Ligamentous instability which is ratable and Called (AOMSI) Alteration of Motion Segment Integrity can most certainly be treated and stabilized. The Council on Chiropractic Practice Clinical Practice Guidelines 3rd edition, published in 2008 has listed on page 14, "impairment due to loss of motion segment integrity" "as a component of the subluxation complex." Obviously the spinal subluxation complex and its various components are the scope of chiropractic practice and treatment. Though ligament injuries are usually permanent, the effect that they have clinically is not and can be properly stabilized through an appropriate functional recovery program.

