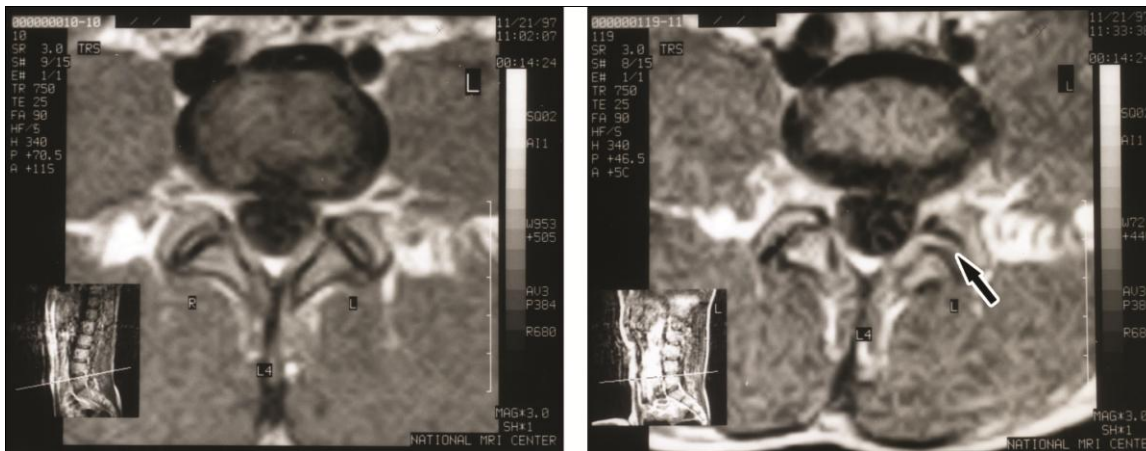


Z JOINT CHANGES IN LOW BACK PAIN FOLLOWING ADJUSTING

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The purpose of this continuation project (NIH/NCCAM # R01 AT00123) is to use MRI to evaluate gapping of the zygapophysial (Z) joints following side-posture positioning and side-posture spinal adjusting in subjects with acute low back pain (LBP). A fundamental hypothesis of one of the beneficial effects of chiropractic spinal adjusting is that adhesions, developing in the Z joints following hypomobility of these structures, are thought to be alleviated by separation (gapping) of the Z joints through spinal adjusting. In the previous study, side-posture adjusting was found to gap the Z joints in healthy subjects. The aim of this study is to determine if differences can be measured in the L4/L5 and L5/S1 Z joint spaces during side-posture positioning and after lumbar side-posture spinal adjusting of 112 subjects with acute LBP, and to determine if the amount of gapping is related to pain relief and improved function. Subjects will be scheduled for two MRI appointments, one at initial presentation and another following two weeks of treatment. At the initial MRI appointment the subjects will be temporarily randomized into one of 4 MRI groups: 1) neutral positioning, followed by side-posture positioning (most painful side up); 2) neutral positioning, followed by side-posture adjusting (most painful side up), followed by neutral positioning; 3) neutral positioning, followed by side-posture adjusting (most painful side up) and remaining in side-posture; and 4) (pure control group) neutral positioning, followed by very brief side-posture positioning, followed by neutral positioning. MRI scans will be taken with the subjects in the original neutral position and in the final position. At the second MRI appointment, subjects will be assigned to the MRI group opposite to the one to which they were randomized during the first MRI appointment. Three observers, blinded to each other and to subject grouping, will make anterior-to-posterior measurements (A-P gap) of the Z joints directly from the MRI scans. The gapping difference between the second and first scans of each MRI appointment will be analyzed to determine if differences exist between the 4 groups and if the amount of gapping is related to relief of pain (difference in Visual Analog Scale from initial exam to MRI appointment) and disability (difference in Bournemouth Questionnaire scores). The results of this study will be used to increase understanding of the mechanism of action of lumbar side posture adjusting and side-posture positioning in acute LBP patients. (H-0107)

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Legend: Two MRIs showing cross-sections through the lumbar region. The top of each image shows the region of the intervertebral disc/vertebral body (oval in shape) and the two (left and right) zygapophysial (Z) joints (a.k.a., facet joints) are seen toward the bottom of the images. The two MRI scans are of the same individual and were taken before (left) and after (right) a spinal manipulation. The arrow points to where the left spinal joint (Z joint on "reading right") is more "open." This "therapeutic gapping" of the spinal joints is thought to break-up connective tissue adhesions that develop when the joints do not move sufficiently. This study is funded by the National Institutes of Health/National Center for Complementary and Alternative Medicine (G. Cramer, Principal Investigator). Figure from: Cramer et al., *Journal of Manipulative and Physiological Therapeutics*, 23:380-394, Figure 7C and D (with permission).