BACKGROUND CONTEXT: Prior studies have investigated the roles of age and degeneration on lumbar segmental ROM only using univariate analyses. However, multivariate analyses are also required to differentiate the multiple factors that may affect ROM and quantify their relative effects.

PURPOSE: To assess lumbar spine segmental ROM with flexion/extension (F/E) radiographs and determine the relation to clinical variables.

STUDY DESIGN/SETTING: Retrospective review and multivariate analysis.

PATIENT SAMPLE: This study retrospectively reviewed 376 patients who presented to our clinic with lumbar or radicular complaints and had F/E radiographs taken. 118 patients were excluded for previous surgery, sacralized L5, scoliosis, fracture, spondylolisthesis, poor radiographic exposure, radiographic technical difficulties, or unavailable weight/height. The radiographic series of the remaining 258 patients were analyzed, including 117 females and 121 males with ages ranging from 18 to 92 years.

OUTCOME MEASURES: Segmental ROM was assessed for L1-S1.

METHODS: The interobserver reliability of Kellgren Score (KS) and segmental ROM were evaluated for three observers. Multivariate regression analyses were performed for each level. The predicting variables evaluated were: (1) KS at the level of interest, (2) KS at the level above, (3) KS at the level below, (4) age, (5) gender, (6) weight, (7) height, (8) BMI, and (9) smoking. Significance was defined as p<0.05.

RESULTS: Interobserver reliabilities for assessing KS (ICC 0.70) and segmental ROM (ICC 0.80) were good to excellent. In the multivariate analyses, age had a significant negative association with ROM at L1/L2, L2/L3, L3/L4, and L4/L5. BMI had a significant negative association with ROM at L2/L3, L3/L4, and L4/L5. KS at the level of interest had significant negative association with ROM only at L5/S1. KS at adjacent levels, gender, weight, height, and smoking did not have a significant association with ROM at any level.

CONCLUSIONS: The results of this study provide the clinician with insight into factors that influence segmental lumbar ROM. Age was the strongest statistically predictive of ROM and was associated with declining motion, amounting to an approximate 3 degree decrease in total sagittal lumbar ROM in the superior four segments every 10 years. Given our findings that age is the strongest predictor of lumbar ROM analyzed, we can now appreciate a natural history of declining lumbar ROM with age that is independent of degenerative disease. Further, factors related to general body habitus, such as BMI, may be more important predictors of lumbar motion than previously recognized. When controlling for these factors, degenerative disease itself seems to have a lesser role in effecting lumbar ROM than previously accepted.

FDA DEVICE/DRUG STATUS: This abstract does not discuss or include any applicable devices or drugs.