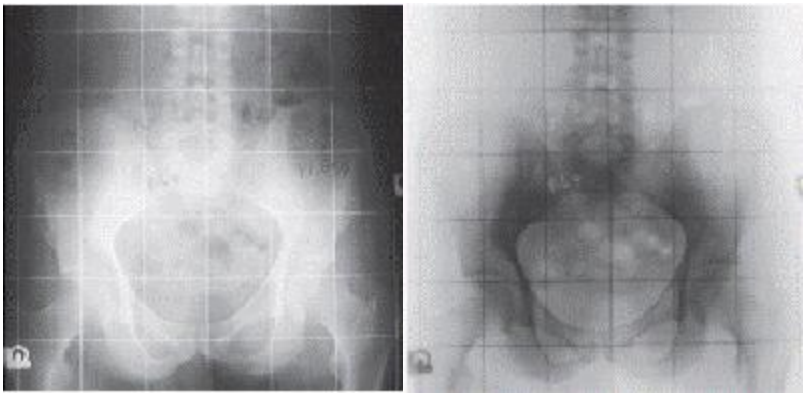
Common Pelvic Misalignment Patterns

(From The September 2008 "G"Note)

A recent article by Dr. Tom Vance in the The 'G' Note brought up a common pattern viewed on the A-P full spine x-ray using the Gonstead analysis. The length of the ilium on the side of spinous rotation of the lumbar spine usually measures longer than the opposite ilium. The width of the ilium on the side of lumbar spinous rotation usually measures narrower than the opposite ilium. In Gonstead listing terms, this equates to a PIEX ilium on the side of lumbar spinous rotation and an ASIN on the opposite side.



The primary reason for this is distortion of the shadow of the pelvis due to the patient standing in a rotated position relative to the x-ray bucky when the x-ray is taken. The common observation of a lower femur head on the side of the PI and EX, and a higher femur head with the ASIN is often due to this same phenomenon. As the ilium rotates away from the bucky/film the shadow of the femur head drops lower on that side. The reason a PI and EX tend to occur together (with the lower femur head) and the AS and IN occurring together and often with the higher femur head, can be explained with the same reasoning.

As the pelvis area rotates away from the x-ray bucky during x-ray positioning, the shadow image of the ilium on the side farthest away from the bucky/film enlarges length-wise, resulting in the longer length measurement. This increased length is also associated with the PI ilium misalignment, because the posteriorly rotated ilium displays as a longer ilium on the film. As the pelvis rotates away from the film, it also causes the pubic symphysis to deviate to the opposite side while the width of the shadow of the ilium on the x-ray narrows, due to the oblique angle of the ilium created such that the view is more of the lateral to medial direction versus the anterior to posterior direction.

The keys to sorting out the measurements and image interpretations to reduce confusion and make sound clinical decisions utilizing the pelvis xray is to consistently position the patient in a predictable manner, check for evidence of common distortion patterns and compare the information on the x-ray to the history of trauma, if any, and the symptoms and objective evidence from the physical examination of the patient. Look at the lesser trochanters of the femurs and check for symmetry of the image. A smaller lesser trochanter on one side usually indicates pre-positioning rotation of the pelvis away from the bucky when the x-ray was taken. A smaller trochanter image along with ipsilateral lumbar spinous rotation, a narrower sacrum ipsilaterally, and a PIEX listing and a lower femur head is a combination most likely due

to shadow distortion from rotation of that side away from the bucky when the x-ray was taken. Anytime more than one of these factors occurs together, one has to be suspicious of a position distration artifact.

If one sees patterns that don't tend to occur merely from positioning error inconsistent with the patterns described above, the findings of misalignment are likely a clinically important finding related to previous creep deformation from trauma or chronic postural forces, or an anomalous bony structure. When the pattern matches that common to positional distortion, the findings of misalignment must be weighed accordingly.

Dr. Mark Lopes heads the GCSS Research Committee and was a co-editor of Textbook of Clinical Chiropractic.