Clinical reasoning is much like being part of a crime scene forensics unit. The diagnostician (be it a chiropractor, orthopedist, neurologist, physiotherapist, massage therapist, etc) has a goal - of putting the pieces of the puzzle together, establishing hypotheses, testing these hypotheses, and using good methodical clinical reasoning in the process. Much like a crime scene investigation, the evidence has to form a picture that can be subjected to scrutiny. In the days of yore, they called this the "scientific method". But one of the main elements of the scientific method is that all the pieces of the puzzle must fit - otherwise, the theory must be revised and the new hypothesis re-examined and re-tested. The clinical reasoning process is but another example of the scientific method. The clinical environment is our scientific study - a sample of one - a crime scene investigation waiting to be sorted out. We use whatever data we can collect, sift through it, process it, and make an assessment of the problem. Oh, and then formulate a treatment intervention that has some efficacy - a completely different issue!

 Some data is better than others. Any scientist will tell you that. Unfortunately, there is a poor inter-rater reliability and validity found with many manual testing procedures. This can effectively muddy the diagnostic water. Now what do we do?

 We have another means of collecting data - we can simply ask the patient. As Sunderland noted in 1978, ‘The patient will always have one witness and the clinician has none’. The patient is, effectively, always right - it is our task to ask the right questions and be able to understand the problem and still have all the pieces fit. Some clinicians believe that the patient may be unreliable - but lest I remind everyone, the patient is the one coming to us with the problem! Of course they know much more about it than we do - they have been living with it!

 There is a need for good consistent data - by improving our skills as a historian and communicator - not just "more data". Robin McKenzie once said that ‘if he or she wishes to obtain a large range of detailed information it must be realized that much of it will be irrelevant or unreliable. If we limit the amount of information, we will increase it’s reliability and relevance’ (Robin McKenzie, referencing Nelson et al, Spine 4:2, 1979.)’

 Now we're faced with the clinical "thinking" process itself. One of the primary causes of error in the clinical reasoning process is observer bias - in which the clinician imposes their own bias on a given clinical situation. It's very easy to attend to one primary piece of information - at the expense of other data that may in fact be contradictory. Some call this "using your favorite diagnosis".

 Then there is the issue of causation and correlation - two words that are oftentimes used interchangeably (and incorrectly so) in the clinical environment. There is a significant difference between causation and correlation. "Causation" would signify that by doing A, I get B. "Correlation " would signify that A and B occur in the same time and space, yet don't necessarily relate to each other as cause and effect.

 There are many great examples of the misguided interchangeable usage of these two terms. One is the perceived relationship between leg length discrepancy and back pain. Though we may see a patient that has back pain and a leg length discrepancy, it is a quantum leap (of faith!) to say that there is anything more than a coincidental simultaneous occurrence of the two in the same time and space - in effect, a correlation and not a causation.

 By reviewing the scientific literature, we find that for all of the people that have leg length discrepancies, there are as many that don't have back pain as those that do!! From a purely statistical perspective, how do we know that they haven't had this asymmetry for many years? And if they did, wouldn't their anatomy have adapted to it? The rules of tissue adaptation don't change that significantly from person to person. Let's be serious - you can have a huge discrepancy - but no pain. So when a small discrepancy exists, it's now the perceived cause of a whole trickle-down sequelae of

events? And even if you "think" you can see it - and you "think" you can measure it, the level of accuracy is abysmal. Ahhhh another digression - but you see the point.

 The scientific literature has also examined magnetic resonance imaging (MRI) of the knee and lumbar spine. As I mentioned in the last post, up to 70% of asymptomatic people will have an abnormal MRI of the lumbar spine. In effect, an abnormal MRI is normal (relative to the population)! Thus if you see an MRI that is abnormal, can you specifically relate asymmetries to an underlying mechanism of disease?

 I like to call this "the bell curve effect" - a purely statistical analysis of the population. If you look at a big enough group of people, you'll have the majority in the middle of the bell curve - with a few special cases on one end or the other. Unfortunately, we rarely see the patient before they have pain, so we rarely see what is "normal" for them. Unless, of course, we asked them.

 Before you start thinking that I want to throw away everything we've done diagnostically in the past, I would remind you that the patient has all the answers. Fear not, because we are able to collect good data by simply listening to the patient. I remember Sergeant Joe Friday on Dragnet - with those incredible words - "just the facts ma'am, just the facts". Little did I know that Sergeant Joe had something there!

 In forensics, the evidence has to fit the crime, and all pieces have to fit together. As Johnnie Cochran said in the OJ Simpson trial, "if the glove doesn't fit, you must acquit". Frankly, Johnnie's words are appropriate in the world of clinical reasoning as well.

 If we can't extract the appropriate information, if we aren't cognizant of our own preconceived biases (and yes, we all have them), if we apply poor reasoning processes on less-than-stellar data, then we won't ever truly understand the dynamics of the problems our patients present with today. They tell us they need to be heard, and they come to us looking for solutions to problems - and not just more problems. Remember, the patient has all the answers ... and if we don't ask the right questions, we may end up with a load of correlations - and still no cause and effect.

 {mos?smf?discuss}