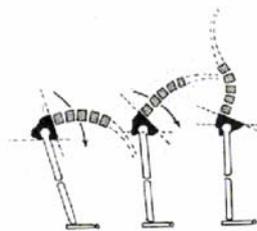


Q & A

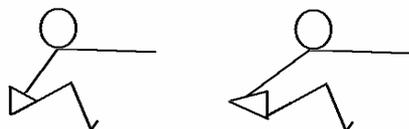
? Dr. Alison McGregor of Imperial College in London is the leading world expert in spine and pelvic biomechanics. We have asked her to explain mechanics of back pain and injury prevention in rowing:

✓ In terms of biomechanics the spine has a very complex design that allows it to offer protection to the spinal cord, transfer weight between the limbs and permit mobility. Perhaps the last two are of more relevance to injury and the sport of rowing, with an annual incidence of between 32-75%.

Structurally we divided the spine into regions, sacral (the pelvis), lumbar (the lower back), thoracic (the chest) and cervical (the neck), however, these regions are all connected and all relate to each other. This is particularly relevant when we consider the back as often we only think of the lumbar spine and neglect the pelvis which it sits on. When we move the spine and pelvis move together in synchrony creating what we shall refer to as lumbo-pelvic rhythm. When we bend forwards the pelvis usually starts the movement followed shortly afterwards by movement of the lumbar spine this is simplified below.

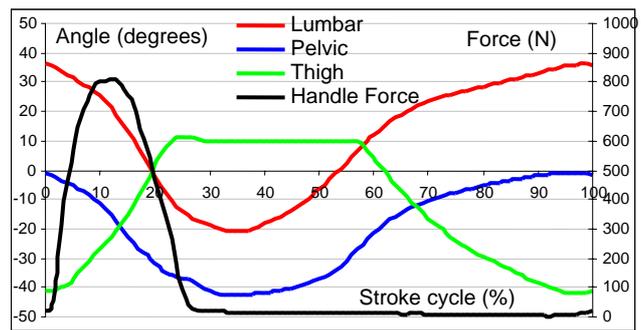


Of course rowing is very similar to touching your toes, and like bending forward it comprises of this lumbo-pelvic motion. However, most people don't look at what the pelvis is doing and just focus on the lumbar spine. Have you ever noticed how some people keep the back straight right from where their bottom contacts the seat whilst others drop their pelvis back and hinge at the junction between their pelvis and lumbar spine? The pictorial below tries to demonstrate this.

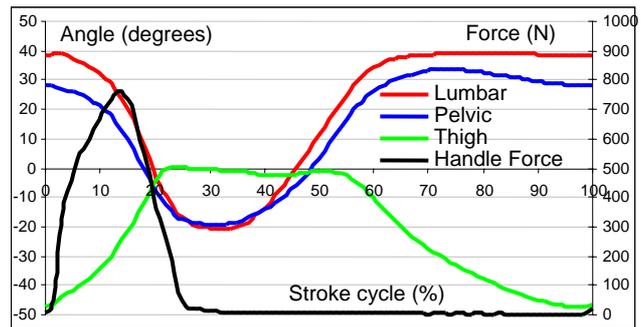


We have been measuring this motion in great detail using motion analysis techniques. Consider the two graphs below, where the stroke cycle is presented as the catch being at 0% and 100% being the return to this catch position. In this first graph, in green we see the knees starting in a flexed position at the catch, extending through the drive and returning to the flexed position during the recovery. We also see the motion of the pelvis in blue and the lumbar spine in red. Clearly there is much more movement in this person in the

lumbar spine with some but limited movement in the pelvis overall though the lumbar spine is moving three times more than the pelvis.



Compare this with the next graph: -



Here we see that the lumbar spine and pelvis move almost in synchrony some that ratio of lumbar to pelvic motion is much closer to one. This position and the maintenance of this healthy relationship between the pelvis and spine we think relieves the loading on the junction between the lumbar spine and pelvis and protects the spine. Incidentally this is the region of the spine most frequently injured in rowers.

From our studies we have seen that certain things can affect this lumbar-pelvic motion pattern including fatigue, rating, rowing level, and strength which we will talk about in another newsletter.

References

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