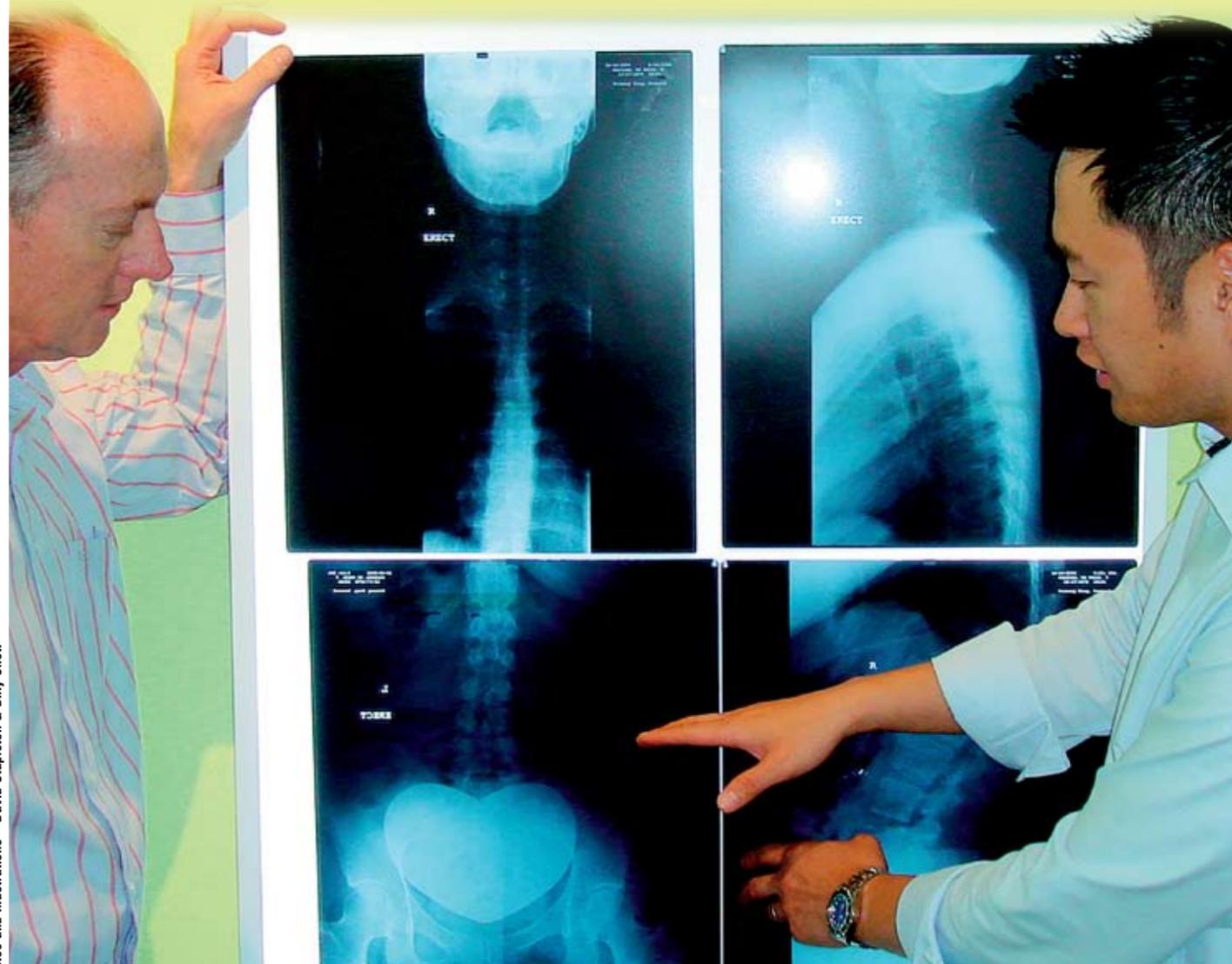


# Beyond the Position

Dr David Stapleton and Dr Billy Chow look at how enhancing the body through aspects such as spinal alignment before achieving correct bike position can set you on the road to an infinitely more comfortable, injury free and higher performing cycling experience.



Doctors Stapleton and Chow plan a strategy of adjustments for spinal correction.

Lately we've been reading so much on how to achieve the correct bike set-up that we find it all a bit confusing if not sometimes, a bit daunting. Whether it's on the net, other cycling magazines or hard-back cycling 'manuals' there seems to be volumes written about what you need to do to be totally comfortable on the bike in an effort to maximise performance. It would however, appear that everyone, no matter who and what their background, seemingly has an opinion and while the proffered solutions are very much a 'variation on a theme' it seems that most of the remedial action is frustratingly uni-dimensional with a focus primarily on the mechanical. You know, take the saddle up here, extend the stem there, measure this and apply that.

Admittedly there's no question that this is all very much part and parcel of a proper bike set-up of which we heartily endorse and recommend to everyone, not just the serious cyclist.

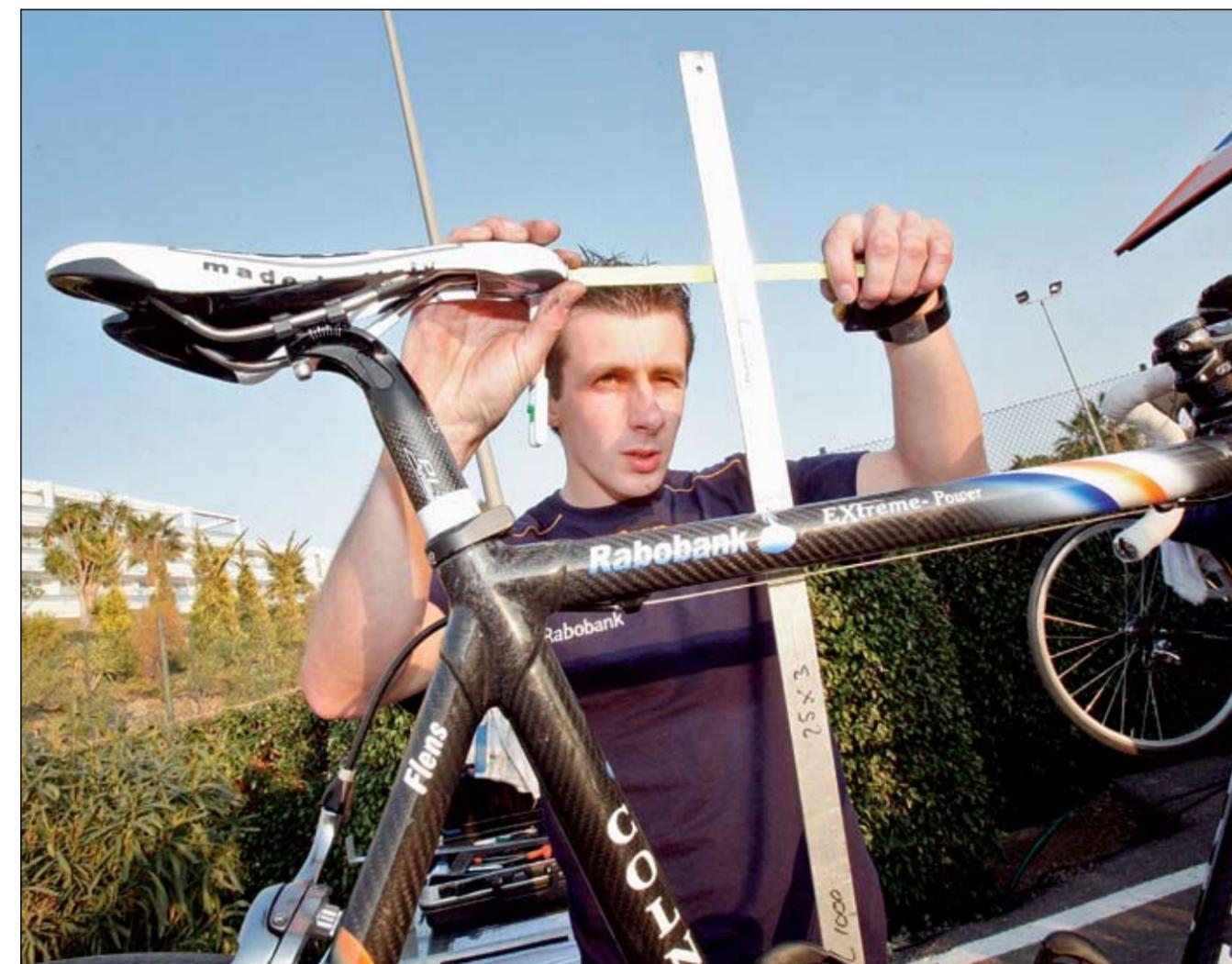
## Two to Tango

It's never our intention to become controversial, in fact far from it. We've been doing this for far too long for any nonsense, but the reality is this; cycling requires two players. Yes, you and the bike, and like car and driver, instrument and orchestra they both need to be tuned to complement each other. Given that once your bike has all the tricks, the carbon additions the 'you-beaut' wheels etc, you get to the point of 'improvement

Never underestimate your body's intelligence and the power of your brain in its ability to 'rob Peter to pay Paul' in terms of muscular and bio-mechanical compensation.

impossible'. That is, your bike has now reached its maximum potential, which means that it now leaves you as the weakest link.

It's well known that a poor fit on the bike consequently leads to skeletal imbalance which in turn, will ultimately create symptoms all their own. Proper positioning on the bike should have the rider's weight evenly distributed over the saddle, pedals and handlebars so that the entire skeletal structure bears the weight instead of a few muscles of the back and arms. Commonly, riders experience a wide range of debilitating problems such as low back pain, paraesthesia or pins and needles to the legs, upper



Making adjustments to the bike through position is important, but sorting out your body first and getting it aligned will greatly assist the process. Photo • Cor Vos

body and neck, together with shoulder and forearm pain, just to name a few. It's fair to say that over the years we've seen a huge range of musculo-skeletal complexities ranging from premature bony degeneration, debilitating knee problems to serious compensation of the larger muscle groups especially throughout the upper torso. All of these ultimately result in loss of power, premature fatigue, and the generation of new injuries and, without a doubt, the exacerbation of old ones. Remember too, that while it's vital to feel comfortable on the bike it's also about maximising performance as well. Just as an example, we know that a proper fit is very likely to increase the economy of oxygen consumption. In fact, research from an Olympic Training Centre in the USA tested elite juniors before and after they were positioned properly on their bikes and concluded that a proper fit reduced their average oxygen consumption by between 8 to 14% at a given workload.

Never underestimate your body's intelligence and the power of your brain in its ability to 'rob Peter to pay Paul' in terms of muscular and bio-mechanical compensation. It will do that without you even knowing about it until such time as the rot sets in and suddenly you have pain. As an example, if you were to walk around with one heel of your shoe just a tad shorter than the other, you would subconsciously and quite quickly, develop a posture that would attempt to absorb the height difference on the other side. Over time however, it would quietly compensate at the expense of your low back or upper thoracic spine. If you've ever worn a plaster cast on your leg or had to use crutches you'll know exactly what we're talking about.

## Not Just About the Bike

Here's the point. Most advice with respect to bike set-up usually takes the body 'as is' to the bike, and adjusts the bike proportionally to the body's measurements, which of course would appear a fair and reasonable thing to do. Common sense would tell you that and no doubt for a lot of people it would appear to work perfectly. And it does.

However, in reality it's not always quite like that. There's an extremely important piece of the jig-saw that appears to be sadly overlooked. People don't come in 'rack' sizes and more importantly what you see on the outside is by no means what exists on the inside. There is a huge variation of imbalances and asymmetries simply because human skeletal frames are certainly not perfect and other complexities arising from things such as injury, postural anomalies and other seemingly 'normal' day to day human imperfections tend to make us all somewhat different. Understandably, that's why some riders can get away with the quick 'mathematical' fix and others simply can't.

From a chiropractic point of view we always seem to struggle with the generalisation that we need to prop skeletal instabilities mechanically with some sort of compensatory device. That is, the assumption is very often made that if a leg is 'short' the immediate solution is to just jack it up with an orthotic device, measure up the bike again, adjust it accordingly and hop on. Importantly we need to find out why the leg is short, that is, do you have an anatomically short leg due to an accident or birth defect or is your leg short, for example, due to rotation of the 'wing' of your pelvis. How would you know? If you had an anatomically short leg, there is no question that your decision to elevate your foot by way of an orthotic device is a wise move and will no doubt serve you well. Podiatrists are great for resolving these types of problems. But if the latter was true you could lift your heel until you were blue in the face and be no further advanced. The truth is that you would more than likely become worse off over time in terms of wear and tear on other supportive muscles, connective tissue and ligamentation.

In other words the message is, where possible, get yourself checked.

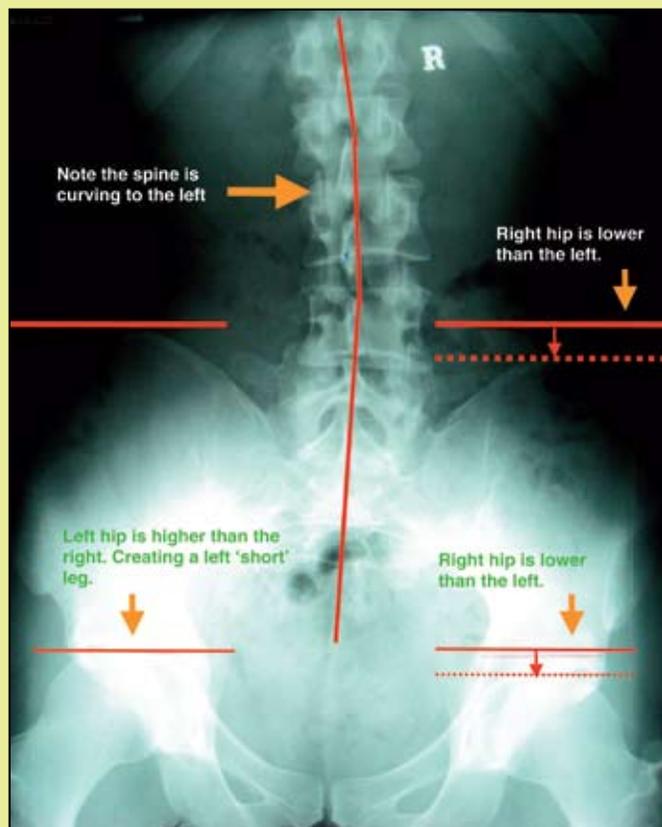


Figure 1

People don't come in 'rack' sizes and more importantly what you see on the outside is by no means what exists on the inside.

Just remember, ADIO, that is, assess your spine and skeletal structure from **A**bove, **D**own, **I**nside, **O**ut. Look at your entire frame and have it evaluated by a professional for what it really is. Very often to the untrained eye, anomalies such as swayback (hyper-lordosis), scoliosis (s-bend in the spine), forward head projection, kyphosis (hunch back) or hip, knee and foot rotation are overlooked or in fact so well camouflaged, that they're never questioned.

Remember also, that any one, if not all of these anomalies may well be asymptomatic or without pain at any time and so once again escape detection.

## Case Study

To help you understand what we mean, here's a classic example of an actual case study, which by the way, is one of many on our files. Confidentiality prevents us from revealing any more than the fact that this person (figure 1 and 2) is a team rider, male, aged twenty something, and

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sought our help out of pure frustration of an ever increasing discomfort on the bike. Over time he had numerous bike set-ups with each being remedial in the short term only to have the original problems return over and over again once he seemed to 'settle in' to the 'new' riding position. In his own words it was 'a bit like putting out spot fires'. He would complain of right quadriceps pain and consequently had his seat adjusted and when that finally settled his shoulder and left trapezius pain would come back. When the distance between the saddle tip and the brake hoods was adjusted, his pain would temporarily subside until something else cropped up. It seemed as if he was just going around in circles with frustration at boiling point and his personal racing performance dwindling badly. We've seen it a thousand times.

It wasn't until we took a look at him clinically that a number of more forensic signs began to surface. A school scoliosis check at around the age of 15 was reported as 'a bit of a problem but nothing to worry about' at the time, and given that it remained asymptomatic until quite recently it was consequently forgotten. However, a series of orthopaedic and postural tests during his examination clearly suggested otherwise. The advice given at age 15 was clearly not a good call. It would appear that now time and inaction were beginning to take their toll and together with a number of more memorable injuries from playing sport at school the picture was beginning to take shape. Now added together with the almost 'obligatory' crashes during his BMX days and again, some more recent road racing accidents, the entire scenario started to make a lot of sense in terms of his current posture and structural anomalies. A further 'posture grid' analysis now started to create the picture of spinal rotation and pelvic instability that we've very often seen before. His surrounding musculature had also begun to mask a number of other typical postural compensations as well.

Take a look at the x-ray (fig 1) and note the lines drawn at the top of the 'wings' of the pelvis. See how much lower the right hip is than the left and check out the curve towards the left in his spinal column as it moves upwards. Also look at the associated height difference in the right thigh bone. Understandably, if the right hip is rotated and 'dropped' the way it is, then obviously the right leg is going to be proportionally 'dropped' as well. The resulting 'torque' effect on the sacral base and opposite 'wing' of the pelvis now gives rise to the so called 'short' leg. It doesn't take too much to imagine the impact that it now has on the actual joint space of the hip, all the articulations of the leg (knee and ankle etc) and the compensating aspects of the upper body and other side of the pelvis. Imagine also the extra energy that it drains to move these areas, the unnecessary corresponding muscular effort and the wear and tear that occurs once he applies a repetitious motion such as pedalling. Include now the forward bending towards the bars required by a typical riding position or moving down on the drops for a while and you can expect some major aggravation right throughout the spine, pelvis and surrounding musculature. Equally, a half decent workout in the hills out of the saddle will also seek out the weak spots almost immediately.

Now look at the upper thoracic x-ray of his spine (fig 2) and you will see how the area marked has had no choice but to compensate as it now becomes the bio-mechanical 'meat in the sandwich' between the low back and pelvis and ultimately, the neck.

There is little wonder that this rider is unable to get comfortable on the bike under any circumstances and even less of a wonder that he has ongoing pain, fatigue and miserable performance.

While he currently remains 'work in progress' our confidence is that this rider will respond very positively over time, as have many cyclists with similar problems before him. It's also important to note that in this case our assessment exhibited a functional 'short' leg, that is, the result of an abnormal structural function as opposed to being the result of a congeni-

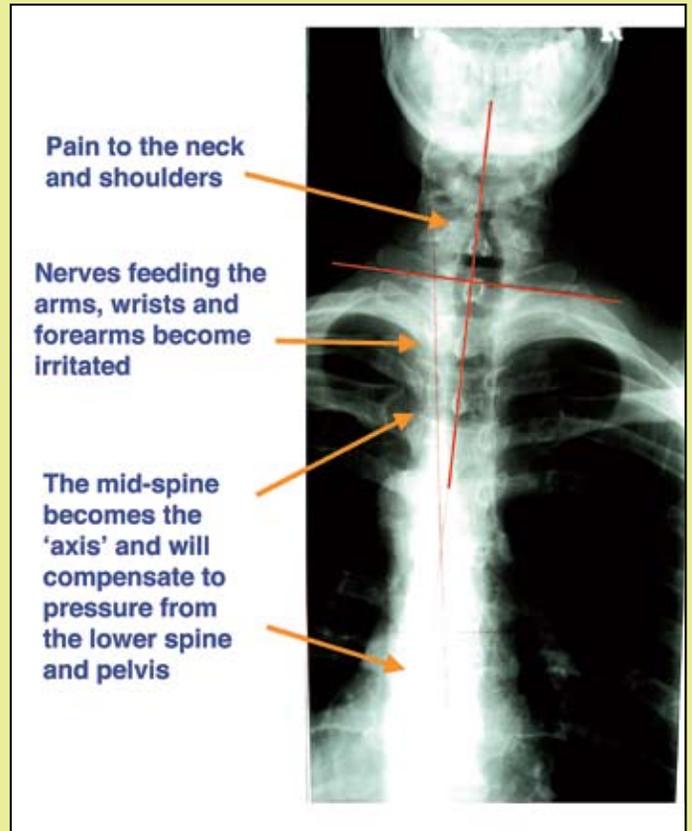


Figure 2

tal or natural leg length discrepancy.

The point is however, that it is particularly important that we were able to clearly identify the structural problem in the first place and secondly, we were able to follow up with spinal correction not just prop up the symptom by mechanical means. Thirdly, we were able to intercept the problem before further degeneration and other complications made the task even more difficult.

Once we have stabilised these bio-mechanical problems as such, we will refer this rider for further set-up on the bike for more mechanical 'micro-adjustments' so that we can monitor the changes and fine-tune our spinal adjustment strategy accordingly. It's vital that we work together with other professionals in these sorts of cases so that we can refine both the body and its fit to the bike as the transitional changes in the skeletal structure take place. If the body was to change and the bike remained the same it would obviously be just as bad as changing the bike without addressing the postural problems.

Understandably, it can be a case of 'the chicken or the egg' but either way if you are unhappy with the 'feel' of your bike and you've been through the set-up procedure more than once, and continue to experience pain or discomfort, perhaps it's time to look at yourself. A full spine and posture check by your chiropractor just may make all the difference. 🐔

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*David Stapleton (DC, Grad Dip MuscMgt, M. App.Sc) and Billy Chow (B.Sc (Physiology), B.App.Sc(Clin), B.Sc (Chiro) are chiropractors with an unshamed passion for cycling. They provide a facility for chiropractic sports performance assessment and musculoskeletal correction in Adelaide, South Australia, where they are chiropractors for the Savings and Loans Cycling Team. They also provided therapy to the Danish CSC Team at the 2007 Tour Down Under.*