

Dying for a seat – part 6

Chris Langham concludes his series by looking at viable, healthier alternatives to the conventional right-angled seat

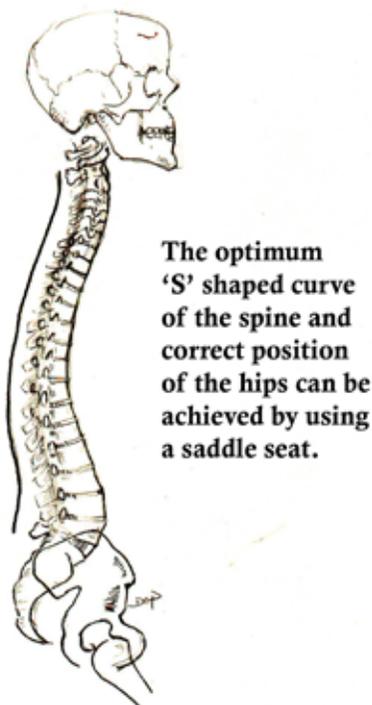
HISTORICALLY the seat of kings, sought after as a thing of prestige and now as ubiquitous in the western world as glazed windows, conventional seating has become the bane of our systemic and musculoskeletal health.

Its effects are quickly felt, resulting in strained, painful backs, slumped postures and compromised metabolisms, and this at a time when research shows that 25% of us in the UK walk for less than one hour and 45% of us walk for less than two hours a week. I presume that those not walking are sitting down or in bed.

Over the last months I have listed the catastrophic catalogue of conditions that have begun to plague mankind as a result of taking a seat and thanks to our increasingly sedentary lifestyles, a lifestyle often forced onto us by our jobs, our pastimes and the way we have to commute, but what can be done about it?

Make a stand

The most effective answer without resorting to technology would be to do everything during the day either standing up or lying down. Standing up is both active, which



has no negative effect on metabolic activity, and positions the centre of gravity over the seat bones rather than behind them, which keeps the posture upright and the spine in its optimal S shape.

Lying down is good because when we lie down our bodies are at their least stressed, but that is a clearly impractical position from which to do anything other than sleep research. So the perfect solution to the problem would be to mimic the physiological benefits of standing but to do so in some sort of seated posture.

To do this we would need to support the musculoskeletal system in a balanced way, without the need for active muscle control to maintain an upright posture, which research demonstrates is impossible for any length of time in a conventional seat.

But why is this, and why does it matter? To find an answer we need to look at the musculature of the back, which consists of two types of muscle fibres:

- Type I, which are called slow twitch or slow oxidative fibres and contain large amounts of myoglobin, the oxygen and iron-binding protein without which our muscles wouldn't work. These red fibres also contain a large number of mitochondria and blood capillaries, and they split adenosine triphosphate (ATP), the enzyme that provides cellular energy, at a slow rate. They are like the leg muscles in marathon runners – they work at a low velocity, have a high resistance to fatigue and can generate ATP by oxidative metabolism. Type I fibres are primarily found in postural muscles including the paravertebral array which maintain the back's posture when sitting.
- Type II B fibres are also known as fast twitch or fast glycolytic fibres – they are sprinters. These contain a comparatively low level of myoglobin, few mitochondria and blood capillaries and large amounts of glycogen, a polysaccharide that acts as a form of fast-draining, cellular energy store. Type II B fibres

provide speed, contracting at a high velocity and tiring easily, and though they are found in large numbers in the upper and lower limbs where they can do most good, they are only found in small numbers in the paravertebral muscles.

Sitting in a conventional seat creates an imbalance in muscle fibre use. Instead of the posture being supported by Type I fibres, which can work for a long time if they are in balance, the fast twitch, easily fatigued fibres become activated and soon feel strained and uncomfortable, allowing the spine to slump into the unhealthy C shape.

What we need is seating that provides the correct posture and active support for the spine so that properly supported Type I fibres are taking the strain and maintaining the correct upright posture for as long as it's needed.

Posture maintenance

Occupational therapist Mary Gale discusses this in her body of work, through which she looks at how the maintenance of an erect posture and the orientation of both body and head are controlled by a basic "premotor interneuronal system" in the spinal cord.

She says: "This premotor system is controlled by several brainstem supraspinal control areas through descending pathways of the spinal cord that target the medially located axial and proximal muscle motoneurons and their basic premotor neurons."

Put simply, your body will react in set patterns to what you do to it and the reaction to conventional seating is hard-wired into your system.

If you sit for too long in a conventional chair, you will begin to suffer in so many ways, while your body's reaction to a more ergonomic solution brings quick results.

Correct seating should support the head and body against gravity while also maintaining the centre of mass (CM) within the optimum base of support while stabilising the body during movement.

If you lean forward, your spine

should maintain its correct curvature and not trigger Type II B fibre activity.

Should you choose to move or engage in an activity, it should help support the spine correctly while you make these movements.

All of the parameters Mary Gale has put into the question of "what provides optimum seating?" are the protocols behind the design of the Bambach saddle seat, which she patented.

Both the saddle seat and sitting perched on a bar stool have been posited as ideal solutions to the problem: how can we be seated in a standing position – maintaining the correct, active posture while seated?

However, the perched position is flawed because it requires an acceptance that one size fits all. Every person has a unique pelvic angle so seats have to be able to match this with different sizes and an adjustable tilt; they also need specifically designed contours that will hold the pelvis in an optimum position for the spine.

Any saddle seat or even perching on a bar stool will be better than the egregious, conventional right-angled seat you are currently sitting in. I urge you to accept this for the sake of your own health and for the money you may end up costing the state in medical fees and me through my taxes thanks to its effects.

However, and I admit a vested interest in this, I have researched every type of seat available, and only one meets all my criteria for providing complete and truly ergonomic success in providing support for the Type I fibres in the paravertebral array while also avoiding compression in the body's organs – and this is the seat I choose to use myself, the one I provide for my staff, and the only one I actively promote through my company: the Bambach Saddle Seat.

Chris Langham is a specialist in ergonomic seating technology and the MD of Bambach Saddle Seat (Europe) Ltd. For more information visit www.bambach.co.uk

