

Dental Practitioners, **get on your horses**

S U P P L I E R

BY CHANTAL BAUDIN

The sitting position on the majority of modern seats has shown itself to be totally unnatural for the spinal column. Well, this is how most of us spend 70 to 80% of our daytime. Result: an incalculable number of spinal pathologies, most frequently, lumbar. Such pathologies are well known to dental surgeons, and which a seat of original design aims to avoid.

It was long ago, very long ago that man stood up on his hind legs and definitively adopted an upright position, when his spinal column took on the shape of a somewhat flattened "S" with a slightly concave section in the lumbar region. This peculiarity (amongst four-legged mammals, the lumbar region is practically flat) has enabled humans to hold their bodies upright by completely straightening the knee and hip joints.

But because of this, the sitting position, which our four-legged mammal friends do not adopt - or anyway not in the same manner as us - is not at all natural for us, in so far as it is not adapted to our spinal column, the nerves of which may be bruised, or indeed even injured or may slip, which is unfortunately all too often the case. And however surprising it may seem to so-called higher vertebrates such as we are or consider ourselves to be, these injuries are more often due to our sitting position on a "normal" seat than to intense effort!

The higher vertebrates, if such they had been, should really have noted that the incredible increase in back problems in fact coincided with the current, more-over relatively recent, use of the chair in historical terms. And the very use of the chair is baffling - is its use itself because we are superior beings? - with notions of ethics and discipline. Holding one's back upright thus when seated, with one's knees close together, eyes looking

straight ahead, - such is deemed to be "dignified" and "decorous".

Far be it for us to be critical of ethics and discipline, but, under the circumstances, it is because of them that the small of the back — by which is understood the base of the spinal column — is injured. As the sitting position brings about the effacement of the natural "S" of the back and thus calls for consider-



Sitting at a desk, the body is bent forward to work. The natural curvature in the form of an "S" then becomes a "C" and the discs of the lumbar vertebrae are compressed.

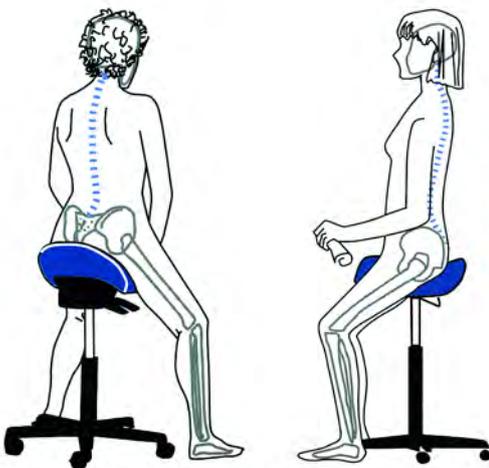
able muscular exertion. Worse still, sitting at a desk or at the head of a dental chair, the body is bent forward to work, and the "S" then becomes a "C", which hugely increases the pressure exerted on the base of the column and may lead, overtime, to permanent disability.

To crown it all, furniture design for the past 50 years has done nothing to improve matters, in that, though humans are getting bigger and bigger, tables and chairs are getting smaller in deference to the international standards decreed for them!

The presence of padding or cushions on



The position on horseback appears ideal in so far as the articulation of the hips forms an angle of about 45° from the spinal column, which perfectly balances the anterior and posterior muscles of the body, placing the centre of gravity above the fundament rather than to the rear. It preserves the natural curvature in the shape of an "S" of the spinal column and enables the body to balance whilst at the same time facilitating the movement of the arms, body and head.



The Bambach Saddle Seat is designed on the model of a horse saddle, that is to say, it maintains the base of the spine in a neutral position to preserve the natural curvature of the spinal column.

the backs of some contemporary seats at the level of the lumbar region is self-evident proof, that the harmful nature of the sitting position is recognised. Specialists are thus in agreement in underlining that sitting on a flat chair calls for the articulation of the hips at an angle of 90°, which is not suitable for the lumbar vertebrae, quite simply because the hips can only adopt an angle of 60° naturally and it is only by tilting the pelvic bone backwards that the spinal column can "supply" the remaining 30°.

Some will raise as an objection that, since it is unnatural to sit on a seat, one must work standing up. But this position quickly proves to be fatiguing for the back and the leg muscles and may bring about an accentuation of the curve of the lumbar region. Now, too pronounced a lordosis of this part of the spine (for example in the case of a pregnant woman or... beer drinker) is obviously not recommended.

Some people suffering back problems actually prefer kneeling to sitting. Which, in the view of Bridger, a specialist in ergonomics, constitutes the ideal position for our backs. Quite simply because in this position, the lumbar camber is the same as that in the standing position. Such a natural camber which is also maintained on a saddle of a horse...

PUTTING THE ARTICULATIONS of the hips in repose

The horse and the back, these are truly two preferred subjects for Mary Gale. The horse, because this Australian lady has passionately enjoyed horse riding from her childhood years. The back, because at the age of 14, as the result of a fall from a horse as it happened, she had to undergo two laminectomies. Which has no doubt had more than a little to do with, her vocation of occupational therapist.

In carrying out this function, at the rehabilitation centre of Hornsby Hospital in Sydney, she was one day approached by a patient with a request. This patient, a motor disabled female since suffering a vehicular accident, wanted to ride a horse. Mary accepted, and organised riding lessons for her.

And, contrary to all expectations, the patient was able to stay on horseback without help, as, like all those who have suffered cerebral injuries as a result of birth injury, car accidents, meningitis... she was already aware of problems of balance which required her to be attached to a seat or to her wheelchair.

The success of the experiment led to its being repeated with other patients suffering from similar disorders, which often proved to be a decisive factor in their rehabilitation.

But how can this paradox be explained? In other words, what distinguishes the sitting position on a normal chair from that adopted on the saddle of a horse?

The question began at this point to haunt Mary Gale, and continued to plague her incessantly, even though in the meantime she had given up her career as an occupational therapist in order to take over her father's inheritance in a cable manufacturing factory.

Mary Gale persevered undeterred with her reflections on the problem. Thus she started by trying to reproduce the position of the saddle ...without the horse, and became aware that sitting astride, used in certain kinds of functional rehabilitation does not allow the patient to stay upright unaided: without the saddle and the support of the legs in abduction, the pelvic bone rolls backwards and the patient loses balance.

Assisted by the young engineer, another occupational therapist and a physiotherapist, she instigated bibliographical research to seek an explanation for this phenomenon. And the thesis of Dr A. C. Mandal, a Danish surgeon appeared a determining factor. According to him, the best, posture is unquestionably that which is adopted on the saddle of a horse, as the articulations of the hips are in a position of repose at an angle of 45° and the lumbar hollow is maintained. Taking on the natural curvatures of its spinal column, the body enjoys perfect muscular equilibrium, with a lesser pressure exerted on the vertebral discs. This explains why, in particular, the motor disabled are able to balance when on horseback.

A WEIGHTLIFTING EXERCISE *sitting down*

Mandal, and along with him, others, affirm, which are proofs in support of the case, that the pressure between the vertebral discs increases considerably when a person is sitting on a flat seat. And leaning forward when sitting to carry out continuous and/or critical work, as in the case of a dental surgeon, increases this pressure yet further. Another author, Nachemson, has also shown that the intra discal pressure which is some 100 kg in the standing position, rises to 140 kg when one is sitting on a flat seat and to...175 kg when, on the same seat, one bends forward to work! This is the equivalent of lifting a considerable weight.

But, whereas in the case of a weightlifter, or even of a ballet dancer lifting his partner, this pressure on the vertebral discs lasts for a few moments only, the spinal column quickly recovering its natural curvature, it may last hours for professionals such as dental surgeons and, day after day, year after year, culminating assuredly in real trauma.

For Mary Gale, the contours of the Bambach Saddle Seat, which she and her colleagues have perfected after submitting it to a battery of tests, enable the user to adopt the less compressing position for his spinal column, even

when bending forwards for long periods, as the inclination is made thereby from the hips, and not from the waist as on a flat seat.

The Saddle Seat is effectively designed to reproduce the natural curvature of the spinal column when standing. Furthermore, the muscles and the blood vessels of the posterior chamber of the thigh not being crushed, blood circulation through the veins is facilitated, so limiting tingling (or "pins and needles") sensations in the lower limbs.

Finally, the natural position which is allowed by the Bambach Saddle Seat frees the lungs and the abdomen with, as benefits, better breathing as well as better digestion.

We shall leave Mary Gale to have the final word. A word in the shape of astonishment in the light of the heavy expenses borne by dental practitioners for their training and their professional equipment – that is to say, for the welfare of their patients – compared to those – often ridiculous – which they allow for their own comfort: "the least expensive part of their equipment", she notes, "is often the seat on which they are going to spend all their workdays".



Mary Gale, the designer of the Bambach Saddle Seat



The Bambach Saddle Seat enables the user to adopt the least compressing position for his spinal column, even when bending forwards for long periods, as the inclination is thereby made from the hips, and not from the waist as on a flat seat.

DYNAMIC SITTING POSITION STUDIED BY ELECTROMYOGRAPHY

By Serge Rouquette and Chantal Baudin

As the logical succession to their long research program, M. T Verkindere and C. Lacombe - respectively, lecturer in biological sciences and assistant lecturer in ergonomics in the Faculty of dental surgery at Toulouse - who had in "1992 conducted research into the

"kneeling sitting" position, they were to analyse, some years later, so-called dynamic sitting position on the Bambach Saddle Seat.

The two studies were conducted in accordance with the same protocol in global electromyography, a technique which Ms Verkindere knew well having practised it for 17 years confined mainly to the odontological field, that is to say on the masticator muscles.

Utilised also in medicine in the treatment of nervous and muscular

pathologies, electromyography, thanks to electrodes patched onto the skin, measures the electric potentials of the muscles when they are in activity, a method the limitations of which Ms Verkindere herself was well aware, to the extent where, in particular, only those muscles situated anatomically on the surface are concerned.

The study was carried out on 18 voluntary odontologists, three of whom were women of between 31 and 59 years of age, who were called upon to mime, on a phantom

TP*, placing amalgam on an inferior premolar tooth, and measuring the muscular activity in repose as well as that of the three work phases, namely anaesthesia, drilling the cavity and the placing of the amalgam itself. The position of the patient was adopted to suit the choice of each of the practitioners.

The muscles examined were selected for the extent of their role in the sitting posture. These were the trapezius muscle, the spinal, large dorsal and abdominal muscles, and the quadriceps muscle.

In the event, notes Ms Verkindere, on a purely scientific basis, the differences of muscular activities measured by reference to tradition a seating are not very distinctive. However, she emphasises, the practical result is much clearer to her, in so far as the subjects all noted a sensation of well-being and improved comfort, by reason of a more dynamic sitting position due to its slight upswEEP by contrast with a normal seat, and due to the comfort of a seat fixed in the anterior-posterior direction, and to the freedom of movement of the Saddle Seat by virtue of its rollers.

All these are reasons which have led numerous occasional users to adopt it definitively, recognising that they had no back problems afterwards. This moved Ms Verkindere to speak not only about the preventive effect of the Saddle Seat, but also about the "relative" therapy.

By the moderate muscular activity which it calls for, this type of seat promotes supple musculature, which rheumatologists are in agreement in recommending, and which disqualifies from this point of view the "kneeling seat" (whereby the weight of the body, pelvis and legs being blocked, rests on the iliac crests and on the knees, and where the practitioner has no contact with the floor) on which the some authors measured a complete drop in muscular electric potentials.

When one considers the special posture called for on the Saddle Seat,



The electromyography laboratory of the Faculty of Dental Surgery of Toulouse where the study on the dynamic sect was carried out.

which is not exactly spontaneous for women and its corollary, ie the necessity to work in trousers, or at least in a very wide skirt, Ms Verkindere responds that many female odontologists already work in hospital uniform trousers, and that female students who, in the Faculty of Toulouse, have tried the Saddle Seat, have not been at all put off by these aspects, but, on the contrary, they have readily adopted them.

In the light of these appreciations, subjective of course, but practically unanimously electing in favour of the Bambach Saddle Seat, in respect of the well-being felt, Ms Verkindere concludes that, compared to the standard seat which has demonstrated its harmful nature for the back, the dynamic sitting position - the spinal column quite straight, the vertebral discs absolutely uncompressed, on a slightly superelevated and very stable seat - appears clearly more favourable.

In her teaching capacity, she deplores in this respect that ergonomics courses are only offered to students in the fourth year of their course, that is to say at the time when they have already started to work and thus to adopt certain habits... "Why not bestow this teaching by developing it earlier in their training, as it is so very evident that when they start

to practise, young practitioners however, preoccupied with many other problems, take no heed of the risk they are running, of being seriously disabled some years later, as certain dorsal pathologies, it must not be forgotten, may, over time as a consequence, put an end to their professional activity!"

*Signifies that 'TP' is an undefined abbreviation