THE HEALTHY GUITARIST

How to save energy,
avoid injury and
get more out of your playing

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acordes
CONCERT

CONTENTS

· The type of chair. This is an aspect that will be covered in much greater detail later.
· The size and shape of your guitar.
· Optional use of rests and ergonomic supports.

The right combination of all of these factors should always provide you with BALANCE AND POSTURE ECONOMY: allowing your well-tuned anti-gravity muscles to maintain their position for long periods with *minimum effort* whilst also ensuring enough stability for your dynamic muscles to act as freely and efficiently as possible.

Although all guitarists should factor in posture work as one of the many techniques that have to be learnt and taught, sitting correctly with the guitar is a technical area that is largely overlooked. Pity, since the technical quality of much of what a guitarist does relies heavily on a good sitting position, as I shall go on to explain.

In terms of health, the main TARGETS that a sitting position should achieve are:

- Providing a stable base that is as comfortable as it is economic and that serves as a support to hold the guitar in the right position
- Creating a balanced posture that ensures full freedom of arm and hand movement

Why your chair might be your enemy

We make such unbridled use of chairs - that most commonplace of furniture items - that we are often hard pushed to see them as potentially hazardous. Indeed, chair etiquette is something of a contradiction in terms - many of us will have at one time been told to 'sit up straight', 'stop slouching' and 'get your elbows off the table'. Oddly though, present day chair design is not in the least conducive to any of this. Take the reclining chair (Fig. 11), designed for maximum comfort when resting and listening, but NOT for working since you have to lean forward in order to do anything, causing considerable strain on the lower back. (Viel and Esnault, 2001). Orchestral musicians are all too familiar with the technical difficulties of playing in this kind of chair, an all too common occurrence on tour when the furniture is bought with the audience who have come to listen in mind rather than the musicians who have come to work.

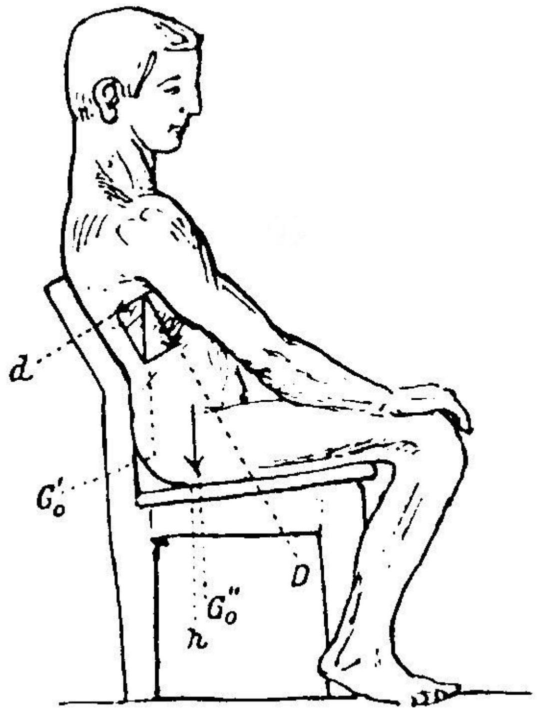


Fig. 11

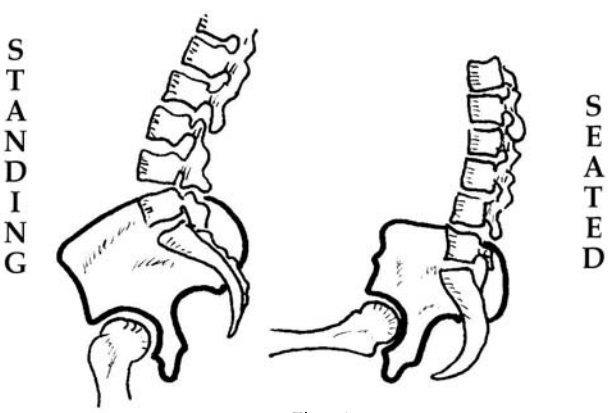


Fig. 12

So why is sitting in an unsuitable chair so harmful? The answer to this question lies in the mechanical behaviour of the spine:

Several decades ago, studies in radiology proved that simply sitting down caused an imbalance in the spinal column (Keegan, 1953). This is because when the hips are bent at an angle of more than 60º to sit, the pelvis is automatically pushed back, which flattens the natural curvature of the lumbar spine (Fig. 12).

- Comfortable enough to hold the position for as long as necessary without strain or fatigue.
- Access to all strings in order to ensure maximum efficiency with minimum muscular effort.

First of all, make sure that all of the other postural reference points (shoulder, elbow, back, etc.) are in line and that your position is comfortable and balanced.

Right hand:


Fig. 28 a

Three aspects must be adjusted here:

· **Pronation-supination (rotation) of the forearm:** the forearm must be rotated so that the knuckles are parallel to the strings, forming a slight arch. Placing the index and ring fingers at an equal distance from the strings ensures that access to them is balanced in the other fingers (Fig. 28a).

· **Radial-ulnar deviation:** the wrist is placed in the neutral position (or no more than 15-20º beyond this), according to the requirements of the music. This gives you the optimum muscle length needed to achieve maximum output. Also, this is the ideal position for the tendons to glide through their sheaths with as little friction as possible (Fig. 28b).

· **Wrist flexion-extension**: the wrist should be very slightly flexed (no more than 10-20º), thereby ensuring that the fingers are at the halfway point of their movement range. This enables you to enhance muscle efficacy and to use a favourable angle of attack that facilitates the posterior action of the extensors as well as optimising on thumb action (Fig. 28c).


Fig. 28 b


Fig. 28 c


Fig. 29

Once these points have been taken care of, it is vital to watch the position of the right thumb: pushing the thumb back until it is on the same plane as the other fingers or the tendency to close the first commissure of the hand (the space between the thumb and index finger) inevitably leads to the *arch of the hand collapsing*, which is obviously detrimental to the way it works (Fig. 29).

On occasions, achieving the right sound means flattening the arch of the hand and extending the metacarpal-phalangeal joint so that the fingers become clawed. As long as this is part of a general study based on more physiological principles rather than the norm, you can practice this kind of method of attack. When you position your right hand, it is also important to observe what happens when you rest your thumb on the low E string. This is particularly so for students who tend to rest their little finger on the soundboard as this causes the forearm to rotate which means the fingers lose their balance and equidistance from the strings.

The left hand:

Analysing and adjusting the guitarist's left hand movements is far more complex because they are so dynamic - the possible combinations and technical demands are greater in the left than in the right. Even so, the ground rules remain the same, although there will be far less equilibrium. The points made below should therefore be taken as *reference positions* and guitarists should be aware of the huge dynamic variability of the working of their left hand.

As you did before, make the following adjustments: (Fig. 30)

· **Pronation-supination:** (Fig. 30a)
The palm of the hand should face the neck of the guitar (supination of the left forearm) and the knuckles should be parallel to it in order to ensure that all the fingers have balanced access to the strings. Very often, too little supination makes it very difficult to reach the strings with the little finger which breaks the slight curvature of the middle phalanges and therefore prevents a good attack. It is important to keep an eye on this.

· **Radial-ulnar deviation:** (Fig. 30b) Like the right hand, there should be no deviation as a rule of thumb as the neutral position is where equilibrium is found. However, this does depend on what you are playing. Slight ulnar deviation may be helpful to increase the separation of the fingers in very open positions.

· **Flex-extension:** (Fig. 30c) The wrist should not be flexed (10-20º flexion at most, unless the complexity of the position does not allow for anything else). Wrist flexion is a common problem that leads to muscle strain, compressive syndromes and others (chapter 3).

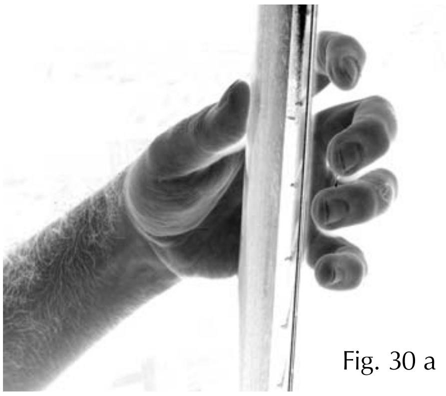


Fig. 30 a

Fig. 30 b

Fig. 30 c

· **Thumb:** (Fig. 30d) The thumb goes behind the neck of the guitar and helps to position the other fingers, providing the left hand with a point of support and stability in addition to aiding the flexor muscle action of the four more dynamic fingers and counteracting the pressure they create as they touch the strings. Looking at the hand in its 'natural' position (letting it drop at the side of the body) reveals that the thumb is 'opposed' to the index finger, not in the sense that the tips are actually opposite each other but in that the inner edge of the thumb faces the index finger. In order to uphold the natural arches of the hand and its correct state of balance, the part that should rest on the neck is somewhere between the tip of the thumb and the side, near

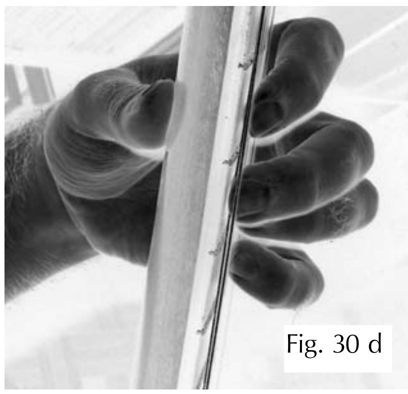


Fig. 30 d

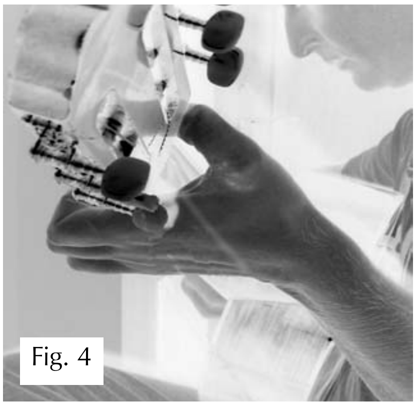


Fig. 4

pain being felt when the wrist and second and third fingers are extended and when the forearm is rotated. Tennis elbow can be caused by forced wrist extension (or dorsal flexion) coupled with repetitive finger movements (Fig. 4).

Medial epicondylitis (golfer's elbow):
This injury affects the inner elbow at the point where it is attached to the flexor muscle of the fingers and the wrist flexors, virtually all of which are maximally used in left hand guitar finger movements. It is aggravated by prolonged 'unsafe' wrist flexion, alongside the repetitive flexion-extension motion of the fingers against the resistance of the strings (Fig. 5).

Fig. 5

Most common types of tenosynovitis in guitarists:

Tenosynovitis affects the tendon and the tenosynovium which covers it.

De Quervain's Syndrome: The long abductor tendons and short extensor thumb tendon slide through the same tunnel formed by the edge of the radius near the base of the thumb (Fig. 6). As they leave this tunnel, the tendons should bend, forming an angle that may exceed 90º in certain thumb separation movements. Swelling is caused by friction between the tendon, the sheath and the bone, which occurs:

- When the thumb is used to pinch and the wrist is simultaneously moved (Fig. 7a).
- When the wrist is held in ulnar deviation during finger movement (Fig. 7b).

And finally, during repeated thumb separation and extension (Fig. 7c).
The typical symptoms are localised pain along the outer (radius) edge of the wrist near the base of the thumb with referred pain in the hand or forearm. The pain increases with thumb movement.

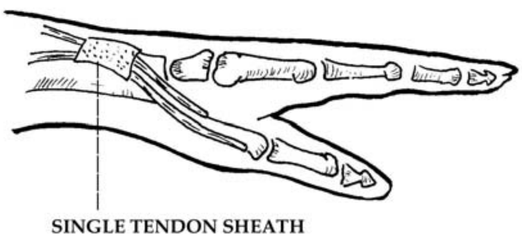
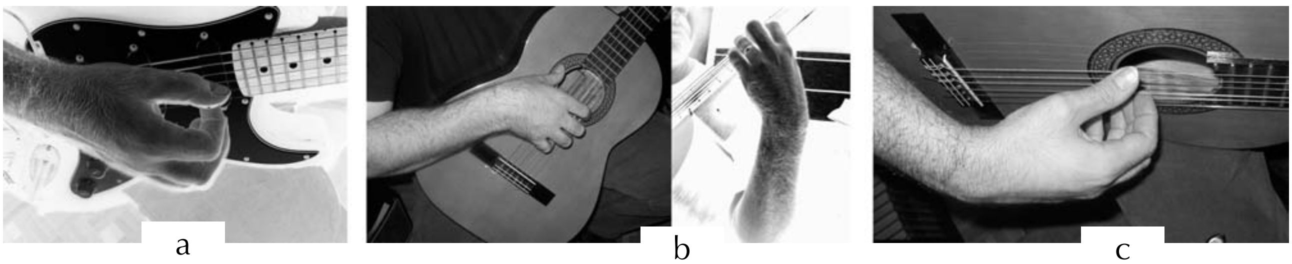


Fig. 6



a b c

Fig. 7: Positions and movements that can lead to De Quervain's Syndrome

NB. Check the position of your right hand in relation to the strings. The wrist must be in the neutral position and permanent ulnar deviation avoided at all costs. This can be achieved by shifting the position of the guitar (Ch. 2).

- When you use a plectrum make sure you move from your forearm rather than your wrist.

flow to the brain (which comes with its own symptomatic consequences such as vertigo, nausea, auditory disruptions, etc.).

LUMBAGO

After the common cold, lower back pain is the most common human health condition and the top cause of absence from work. Although the lumbar spine is not as mobile as the cervical, it bears far more weight and has two particularly vulnerable transition regions: the thoracic-lumbar transition region, which enables relatively important rotation movements, and the lumbar-sacral transition region, from which most of the flexion-extension mobility of this area emanates. Virtually all lumbar conditions can be traced to these two sites since these are the points at which pelvis displacements are offset and which ensure that the body is dynamic. As discussed in chapter 2, the pelvis and the so-called pelvic-trochanteric musculature (which govern pelvic behaviour in relation to the legs) are extremely active in controlling posture and it is their position that determines the equilibrium of all higher vertebrae.

Guitarists often sustain muscle overload because of an asymmetrical pelvic position causing scoliosis - sideways deviation of the spinal column in a series of curves, although in fact it is more often a scoliotic attitude (given that the deviation generally disappears when the pelvic position is corrected) (Fig. 17). Sitting position and ergonomics (posture, type of chair, supports for the guitar, etc.) both play a major role in preventing injuries. But besides muscular ailments (overloading and contractions) and mechanical joint irritations, one of the most significant ramifications of too much strain and lumbar compression is the degeneration of the intervertebral discs and emergence of herniated, or slipped, discs.

Fig. 17

Herniated discs:

Although a disc can slip anywhere along the backbone, it is most likely to occur in the lower back, resulting in acute and chronic lumbago and *sciatica*.

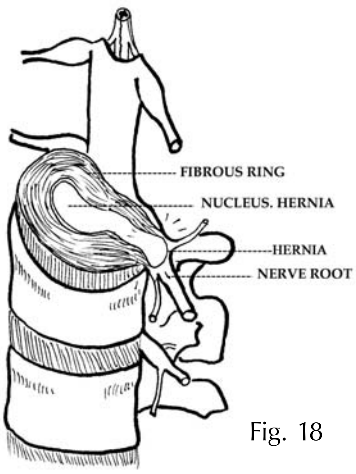


Fig. 18

So what exactly is a herniated disc? In chapter 1 the structure of the intervertebral discs was explained. Due to repeated pressure and wear on the collagenous fibres that make up the fibrous ring of the intervertebral disc, gaps appear through which its rubbery centre or nucleus begins to push out (Fig. 18). Nucleus protrusions or prolapses usually trigger fairly local pain because they press on the ligaments in the backbone. However, if the fibres give way and the rubbery centre is completely displaced (usually into the spinal canal or intervertebral foramina), the disc is said to be herniated. The pressure this places on the nerve root as it emerges from the spinal cord can give rise to neurological signals such as paraesthesia, or tingling, and intense nerve pain along a certain pathway, which in most slipped discs (around the fifth lumbar vertebra) extends down to the big toe with weakness on bending the ankle and numbness between the first and second toes (Fig. 19).

Although pain and motor or sensory disruptions are felt in different regions according to the site of the protrusion, all herniated discs display the same characteristics. Protrusions between the cervical vertebrae tend to cause pain in the arms (either along the inner or outer arm, depending on the nerve root affected).

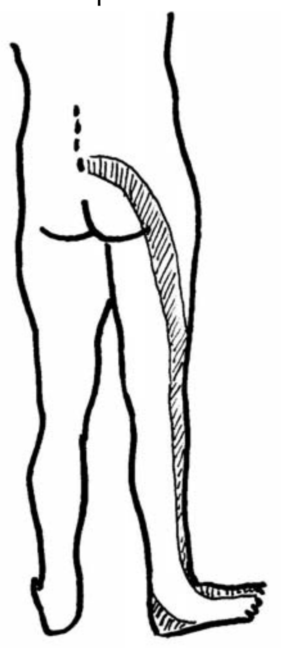


Fig. 19


Fig. 9


Fig. 10


Fig. 11


Fig. 12


Fig. 13


Fig. 14


Fig. 15


Fig. 16


Fig. 17


Fig. 18


Fig. 19


Fig. 20


Fig. 21


Fig. 22

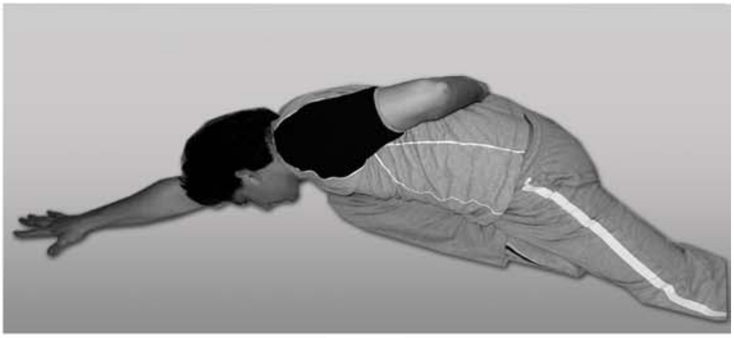


Fig. 23


Fig. 24


Fig. 25


Fig. 26