

## **Ergonomic objections against a unit/cart on the right or left side of the patient chair.**

(Original text is placed in “Ergonomic principles in dentistry. Description of the ergonomic guidelines for operating posture, mode of treatment, the handling of instruments and use of dental units in the treatment of patients”. Section 13.2.

The document was distributed to the participants of the AM of ESDE in Piestany in 2001).

- In this arrangement, an unnatural pick-up of instruments is used due to the too strong rotation of the forearm with hand outward, i.e. back from the body (called exorotation).
- Above-mentioned forearm and hand rotations are connected with sideward flexions and rotations of the upper body, which also have to be avoided.
- Hoses increase the muscular strain due to the tension. Tension and weight of the dynamic instruments must be as low as possible to limit the muscular strain caused by this. (Can be balanced using a front delivery system) .
- By constantly adopting strained postures, e.g. by using a unit beside the patient chair, people no longer experience what is a normally strained posture, as a result of a reduction in awareness of the proprioception (information of the body regarding the muscle strain).  
NB By grasping the upper arm with the hand the difference can be felt in muscle strain of the upper arm when using a natural way of instrument pick-up and when picking up an instrument from a unit right/left of the chair. A German study by Rohmert c.s. showing that 1/3 of the dentist operated with a physiologically unacceptable strain of their muscles offers much food for thought!
- Most of the units placed right or left of the patient chair are not height adjustable so that a reversed man-machine system situation arises: the equipment can not be adjusted to human possibilities, but the dentist has to adjust himself to the possibilities, i.e. the limitations of the machine. This reinforces the aspects described under previous points. It is most noticeable when working in or around the 9.00 o'clock position when the instruments of the unit are positioned sideward or behind the dentist's back.
- By positioning instruments outside the field of view there is a higher risk of stick injuries and falling of instruments.
- Looking up from the operating field when picking up and returning instruments in this unit means that first the eyes must accommodate to the different light situation when looking aside and then again when returning to the operating field. This reinforces eye strain.  
NB If we look at somebody using instruments for particular activities or for do it yourself (DIY) tasks we see that he puts these in front of him, so as to easily grab them.
- A more dynamic style of working of the dentist requires free room on the right/left side of the patient chair, for movements with the working stool, working when standing and walking of the dentist.
- Sometimes a tray for hand instruments is mounted on top of the unit behind the instruments. This causes an increase in frequency of high-strained movements.
- The low unit is often, after the treatment, pushed away from a sitting position. A (tall) dentist will often do so with a C-curvature of the back.

### *Conclusion:*

The unit position right/left of the patient chair is not geared to the requirements of an ergonomic operating posture and operating mode of the dentist.