Surgeon Ergonomics in Minimally Invasive Surgery

Evidence demonstrates that surgeons are confronted with high levels of mental and physical stress caused by uncomfortable, potentially harmful ergonomic working conditions when conducting many Minimally Invasive Surgery (MIS) procedures [1]. Positioning of video carts in comfortable viewing zones in close proximity to the patient/OR table, yet clear of interventional team members, C arms, and other devices is nearly impossible and results in barricades, clutter, and cords on the floor.

Ergonomic deficiencies in MIS procedures result from outmoded environmental design (especially access to video display interfaces) and ergonomically unfriendly instruments. The posture of the practicing MIS surgeon is observed to be dictated by 3 variables:

1. Surgeon's access to patient on OR table
2. Video display viewing angle
3. Geometry of instruments and controls

Consider this observational analysis: “The first problem is seen during all positions and is caused by the placement of the monitors. As the surgeon and the assistant have to stand [at a side of the patient], they are facing each other and obstruct [each others] view of the monitor. This causes the adduction of the head to be able to look around the other person. The other problem occurs when monitors are placed too high resulting in an extension of the neck during the entire intervention. This can cause stiffness and pain in the neck. Reorganization of the operating room set-up and monitor position, design of a dedicated operating table and of specific instruments might help to overcome the current ergonomic problems”[2]. See Exhibit A & B.

A new product called NuBOOM has been developed to assist hospitals in providing posture correct ergonomics and MIS visualization capabilities in general surgery operating rooms. The NuBOOM is an ergonomically friendly, overhead boom system that also alleviates room clutter by consolidating MIS equipment such as video cameras, insufflator, lasers, and electrosurgery devices into one location. Its principal advantages are its unprecedented ergonomic delivery range of displays, elimination of cart clutter ringing the sterile field, and fast installation time. See Exhibit C.

Note the surgeon’s posture in the photo. NuBOOM delivers displays into ergonomically correct locations to make a surgeon’s work experience less tiring and free from posture induced neck and shoulder pain. The NuBOOM delivers 4 displays to the most comfortable viewing position for the surgeon and assistants- in alignment with their upper torso, neck, and head. According to a recent paper, the optimal operative posture is realized when the surgeon, the trocars, and the area of manipulation are aligned in the same vector, and the monitor is placed facing the surgeon.” [3]. See Exhibit E.

Surgeons using NuBOOM have validated improvements in ergonomic comfort, improved visualization capability, and freedom from cognitive distractions caused by safety concerns and equipment clutter. Compared to the video cart paradigm, NuBOOM consolidates up to 6 carts worth of equipment, clearing up floor space and removing cords from floors. Compared to ceiling boom equipped MIS suites, the NuBOOM delivers more displays, with greater adjustability, while obstructing less airspace required for surgical team mobility. NuBOOM delivers great freedom in environmental planning of the OR, inciting a serious cost/benefit analysis on upgrading general surgery rooms with NuBOOM vs. ceiling secured booms or specialty uroscope tables). See Exhibit D.

Information on surgeon ergonomics and NuBOOM is available at www.compviewmedical.com. CompView Medical’s email is cvmsupport@compview.com. CompView Medical’s telephone number is 01-503-641-8439.
