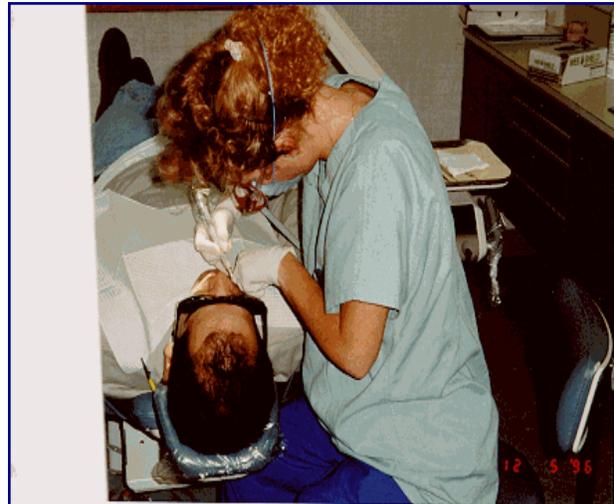
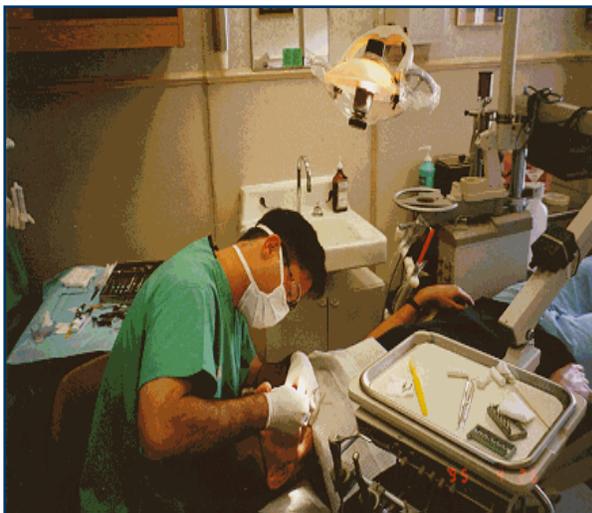


## **HAZARD ABATEMENT FUNDS IMPROVE NAVAL HOSPITAL ROTA SPAIN DENTAL PROVIDER COMFORT**

Periodontal surgery and other dental procedures force dentists and their technicians to maintain prolonged awkward postures bending over patients while grasping surgical instruments. Specific [Work Related Musculoskeletal Disorders \(WMSDs\)](#) in the dental community include neck disorders, tendonitis and back strain.

Maintaining static awkward postures for long durations overburdens and fatigues the muscles and soft tissue of the back, neck, and shoulders. Prolonged work in such postures increases the risk of injuries and WMSDs. Using a “pinch grip” to grasp the dental tools in combination with high hand forces and repetitive motion strains the tendons of the arms and hands.

[Ergonomics](#) studies of the dental work force have documented significant occurrence of chronic ergonomics stress and discomfort (as manifested by physical therapy consults and requests for workplace intervention measures with ultimate hazard abatement (HA)). According to Burke, et al.; musculoskeletal disorders were cited by 29.5% of dentists as the primary cause of early retirement (ahead of cardiovascular disease, neurotic symptoms, and tumors). Other studies (Liss, et. al) found that over 50% of dental hygienists surveyed report suffering from chronic shoulder, back, and neck pain; while Finsen reported almost identical percentages for these same body regions among both male and female dentists.



*NAVHOSP Rota Dental Clinic prolonged gum surgeries can last from 2 to 6 hours; during which staff are chair bound attending patients and assisting dentists in the non-neutral postures shown.*

At the U.S. Naval Hospital (NH) Rota Spain, a dental assistant staff member consulted physical therapy services with complaints of pain/discomfort related



Results of a dental technician field evaluation discomfort survey showed a majority of scores in the uncomfortable range for the upper-mid-lower back and pelvis.

to ergonomics stressors. Mr. David Hiipakka, Certified Industrial Hygienist in the Industrial Hygiene department, initiated a follow-up ergonomics field survey and then consulted the Navy Ergonomics Subject Matter Experts (SMEs) [[enetwebmaster@navfac.navy.mil](mailto:enetwebmaster@navfac.navy.mil)] at the request of the treating physical therapist (LT Carrie Dryer). As part of this field evaluation, NH Rota dental technicians were asked to complete a discomfort survey. Survey results showed a majority of 4 and 5 scores (on a discomfort rating scale of 1 to 10 in which a zero is “Very Uncomfortable”) for the upper-mid-

lower back and pelvis. The members also rated 5 for the mid-lower legs and feet. The discomfort scores are indicative of the prolonged static and awkward seated postures.

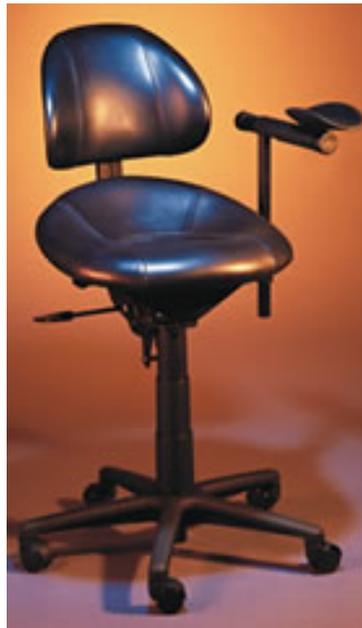
The goal of an ergonomics program is to reduce the frequency and severity of WMSDs by designing work tasks or workstations that minimize the risk of WMSDs. Frequently, ergonomics risk factors can be minimized or resolved by introducing minor modifications such as adjusting work station heights (in this case dental provider seating) to eliminate bending of the back, neck, and shoulders. The ergonomics program mandated by the Navy’s Occupational Safety & Health (SOH) policy instruction (OPNAVINST 5100.23G) states in Section 2307:

**Workstation Design.** *Workstations should be easily adjustable to accommodate the person/persons performing a specific task or job, not just the average worker. Generally, design limits are based upon a range from the 5th percentile female to the 95th percentile male values for critical body dimensions.*

Working with the Rota Dental clinic leadership (Captains Blake Turner and Tracy Scott), an initiative was started to search specialty dental provider seating for new innovative designs, which offered NH Rota staff members optimal seating adjustability and torso/arm support during patient care.

The goal of the search was to find a chair that promoted staff member mobility and patient access; and that accommodated different body sizes. Specific desired specifications were:

- ◆ Stability (5 legged base w/casters)
- ◆ Hands-free seat height adjustment
- ◆ Adjustable foot rests
- ◆ Adjustable, wrap-around body support
- ◆ Seamless upholstery (for infection control).



Following trial testing at a dental equipment trade show, a dentist and dental assistant chair (left & right, respectively) were selected for trial testing at the NH Rota clinic under actual patient care conditions.

Following trial testing at a dental equipment trade show, dentist and dental assistant chairs were selected for trial testing at the Rota clinic under actual patient care conditions. However, a clinic-wide dental provider chair upgrade ergonomics project was outside the scope of internal Command funding at the time. Mr. Hiipakka turned to the Navy Mishap Prevention and Hazard Abatement (MPHA) Program. The MPHA Program, established by Chief of Naval Operations (CNO) and managed by the Naval Facilities Engineering Command (NAVFAC), was created to assist activities with funding safety abatements beyond their local funding capability. This program is a very progressive effort by CNO/NAVFAC to dedicate extraordinary funding each fiscal year for the specific purpose of abating safety and health hazards with price tags above what local installation budgets can afford.

Working together with a Navy-contract ergonomist (Ms. Theresa Stack) and the NAVFAC, MPHA Project Manager, Ms. Glenna Humphrey, Mr. Hiipakka

successfully solicited approximately \$15K to replace the Rota Clinic's dental provider chairs.

The innovative chair design supports the torso by allowing the technicians/dentists to rest their forearms during procedures. The ability to stabilize the arms reduces the loading on the back musculature. The saddle type seat pan design promotes a more neutral lower back alignment through outer hip rotation. This position further enables the technician/dentist to get close to the patient, minimizing neck flexion.

The two chairs were rotated through a number of dental staff members for at least two months. Team members were later asked to rate the usability of the chairs. Initial reaction from the NH Rota dental providers is highly positive, and this real-world field testing knowledge will now be shared Navy wide by Navy SMEs with other dental clinics seeking similar improvements in providing ergonomically sound working conditions while maximizing productivity and comfort.

Pain and discomfort is a precursor to injury. SMEs strongly believed that optimizing dental provider comfort and thereby reducing their pain and discomfort directly translates into staff devoting more energy and concentration to the care of their patients, ultimately paying a crucial patient safety dividend for years to come while negating provider injury potential.

In terms of gross financial Return-on-Investment (ROI), a cost/benefit analysis noted that the total estimated cost to procure 17 dentist and assistant provider chairs was estimated to be \$15,000. In light of the fact that *one* lost time back, shoulder, or neck WMSD injury can cost the Navy up to \$30,000 in lost work days and rehabilitation costs, such an investment represents an immediate ROI of over 200% if one such injury is avoided.

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