

DoD Ergonomics Working Group NEWS



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NEW CHAIRS + INCREASED COMFORT = 200% RETURN ON INVESTMENT!



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 these non-neutral postures.

Periodontal surgery and other dental procedures force dentists and their technicians to maintain prolonged non-neutral 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 non-neutral 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.

At the U.S. Naval Hospital (NH) Rota Spain, a dental assistant staff member consulted physical therapy services with complaints of pain and discomfort related to ergonomics stressors. A certified industrial hygienist (CIH) in the Industrial Hygiene Department initiated a follow-up ergonomics field survey and then consulted the Navy ergonomics subject matter experts (SMEs) at the request of the treating physical therapist. 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 where a zero is “Very Uncomfortable”) for the upper-midlower back and pelvis. The members also rated 5 for the midlower legs and feet. The discomfort scores are indicative of the prolonged static and non-neutral seated postures.

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Working with the Rota dental clinic leadership, 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 with casters)
- Hands-free seat height adjustment
- Adjustable footrests
- Adjustable, wrap-around body support
- Seamless upholstery (for infection control)

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. The CIH 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 ergonomics SMEs and the NAVFAC, MPHA project manager, approximately \$15,000 was successfully solicited to replace the Rota Clinic's dental provider chairs.



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

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 2 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 be shared Navy-wide 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. The ergonomics SMEs strongly believed that optimizing dental provider comfort 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.

For More Information

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A dentist and dental assistant chair (left and right, respectively) were selected for trial testing under actual patient care conditions.