

SUCCESSFUL ERGONOMIC AND INDUSTRIAL HYGIENE INTERVENTIONS

DENTAL PROSTHETICS LABORATORY

U. S. NAVAL STATION ROTA SPAIN

INTRODUCTION

Industrial hygiene and ergonomic evaluations at the dental prosthetic laboratory at U.S. Naval Station, Rota Spain revealed the potential for exposure of technicians to hazardous substances and ergonomic risk factors. Modification of local exhaust ventilation systems and resolution of ergonomic risk factors were both completed in the autumn of 1997 with installation of ergonomic laboratory work benches which have local exhaust ventilation systems and task lighting.

ERGONOMICS SURVEY



An ergonomic review of workstations identified the following:

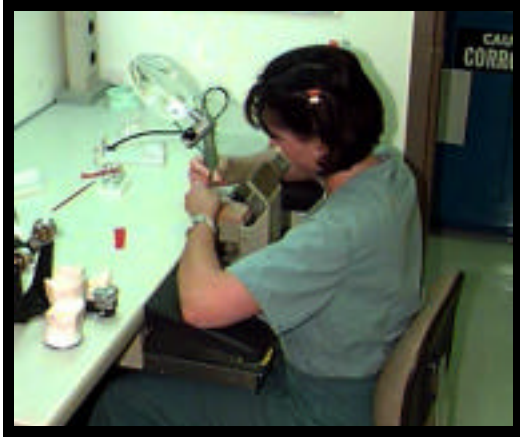
- ◆ Configuration of workstations brought about the posture shown at left and below when technicians worked on dental prostheses. This awkward posture led to discomfort and fatigue in the neck, upper back, and shoulders.

- ◆ Pressure on technicians' forearms led to discomfort and accelerated fatigue from leaning forward for extended periods of time with forearms pressed against the edge of the bench top.
- ◆ Absence of task lighting led to eyestrain and intensified fatigue.



ERGONOMICS INTERVENTION

Acquisition of ergonomically designed workbenches relieved ergonomic risk factors as shown below. The technician is seated in a neutral posture with arms supported by built-in arm rests. The improved workstations also enhanced worker productivity, efficiency, and morale. Specific ergonomic design features include:



- ◆ Placement of prosthetic pieces away from and directly in front of the technician facilitating a neutral back, shoulder, and neck alignment that relieves stress and discomfort.
- ◆ Wide, padded forearm rests support the weight of technician's forearms, eliminating discomfort due to contact with the sharp edges.
- ◆ Specially designed overhead task lighting and magnifying lens attachment minimize eyestrain and prevent fatigue.

INDUSTRIAL HYGIENE SURVEY

METHYL METHACRYLATE VAPORS

Prosthetic laboratory employees had complained of headaches, eye and mucous membrane irritation due to release of organic vapors, specifically, methyl methacrylate vapors, during mixing of liquid and powder components used in dental prostheses.

Review of a survey of the local exhaust ventilation systems built into the workbench determined these ventilation systems to be dust collectors that were not adequate for removal of organic vapors.

DUST COLLECTION SYSTEMS

Industrial hygiene surveys of the dust collection units in 1994 and 1996 indicated inefficiency of the built-in dust collectors due to clogging of filters.

INDUSTRIAL HYGIENE INTERVENTION

The new workbenches are designed with local exhaust ventilation ducts incorporated directly into the dental piece support pad. The local exhaust system captures organic acrylic vapors at their source as well as dust, removing them from the technician's breathing zone and room air. The exhaust system uses activated charcoal filters to absorb methyl methacrylate vapors; disposable paper filters are used for dust control.

POINT OF CONTACT

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