

PROGRAM DIRECTIVE

Program Directive A-205
Issued November 1, 1981
Revised June 29, 2000

SUBJECT: Anesthetic Gases

AFFECTED CODES/

DIRECTIVES: OAR 437-136-010(2); 437-02-1910.1200(f); and 437-02-1900.1000

PURPOSE: To notify and provide guidance to hospital administrators, operating room personnel, dental office personnel, and Oregon Occupational Safety and Health Division (OR-OSHA) personnel regarding a potential hazard to operating room and dental office personnel due to chronic exposures to waste anesthetic gases.

BACKGROUND: Historically, nitrous oxide was considered to be a simple asphyxiant. The permissible exposure limit (PEL) was set at 1,000 parts per million (ppm). Studies have indicated that an elevated incidence rate of spontaneous abortions among operating room personnel and dental office personnel may be associated with chronic exposures to waste anesthetic gases.

Other health hazards which may be associated with waste anesthetic gas exposures include kidney and liver damage, and congenital abnormalities in the children of operating room personnel. Studies to determine the correlation between occupational exposures to waste anesthetic gases and these affects are not conclusive.

In addition to its use as an anesthetic, nitrous oxide is also used as a refrigerant in various types of portable cryosurgical equipment. Flow rates of up to 35 liters per minute have been reported. Cryosurgical procedures encompass ophthalmology, otolaryngology, gynecology, proctology, and simple wart removal.

The National Institute of Occupational Safety and Health (NIOSH) has recommended a time-weighted average of 25 ppm for nitrous oxide, and 2 ppm for halogenated anesthetics. Although much controversy surrounds this recommendation, these levels may be easily obtained in operating rooms when the recommendations found in the NIOSH Criteria for a Recommended Standard Occupational Exposure to Waste Anesthetic Gases and Vapors are implemented. The NIOSH recommended exposure level may not be completely achievable in dental offices at this time.

ACTION:

Requirements: At the present time, OR-OSHA has the authority to require that employers inform employees regarding known health hazards to which they are exposed (OAR 437-136-010(2)). Employees must be informed that chronic exposures to waste anesthetic gases may cause spontaneous abortions, congenital abnormalities, kidney and liver damage.

In addition, OAR 437-02-1200(f) requires that containers of anesthetic and volatile liquids must bear proper warning labels which state the contents, what the hazards are, and precautions to be taken during use of the anesthetic agent.

Example:

**CAUTION
NITROUS OXIDE**

**HARMFUL IF INHALED CONTINUOUSLY.
CHRONIC EXPOSURES MAY CAUSE
SPONTANEOUS ABORTION AND CONGENITAL
ABNORMALITIES. USE WITH ADEQUATE
VENTILATION AND/OR SCAVENGING EQUIPMENT**

Recommendations: To assure operating room personnel of a work environment free from injurious levels of waste anesthetic gases, hospitals should initiate a program which includes the following:

1. Mandatory use of scavenging systems
2. Quarterly leak testing of high-pressure nitrous oxide fittings
3. Daily leak testing of low-pressure fittings in anesthetic machines
4. Adequate ventilation in the operating room
5. Cautious use of containers of liquid anesthetic agents to avoid spills and open containers
6. Maintenance and proper use of anesthetic machines

Consultants and compliance officers should consider possible exposures to nitrous oxide and waste anesthetic gases in all hazard evaluations of health care settings. Special emphasis should be given to anesthetic delivery systems and portable cryosurgical equipment.

**EFFECTIVE
DATE:**

This directive is effective immediately and will remain in effect until cancelled or superseded.