varied from 110 to 130 bpm. Three milliliters of 2% lidocaine with 1:200,000 epinephrine were given as a test dose without untoward reaction. The catheter was then inserted through the needle with minimal difficulty. Another 3-ml test dose of the same solution was given after negative aspiration through the catheter. The patient complained almost immediately of a pressure/fullness sensation in her head. Her facial color became very pale, with almost complete disappearance of her hyperemic skin lesions, and her nailbeds became blue. Her vital signs at that time revealed a blood pressure of 150/90 with a heart rate that was unchanged (80 bpm). These symptoms disappeared in about 2 min. Because a sensory level was obtained to the T12 dermatome bilaterally after 5 min, a further 3-ml test dose was given. Again she presented the same signs, but without the symptom of pressure sensation in the head. Her blood pressure increased to 160/90 without change in baseline heart rate. Because of the possibility that unintentional intravascular injection had occurred, the catheter was withdrawn while aspirating. Dark red blood was aspirated on withdrawal of the catheter from the epidural space. Another epidural catheter was inserted at lumbar 2–3; a T4 sensory level obtained and the surgery proceeded uneventfully with the delivery of a female child, Apgars of 9 at 1 min and 9 at 5 min.

In this case, the usual increase in heart rate observed after iv injection of epinephrine was not seen in this patient receiving metoprolol, a cardioselective beta adrenergic blocking drug. It would appear that there was total inhibition of the beta effect of epinephrine, while the alpha adrenergic effects were preserved.

It is essential, when using an epinephrine-containing test dose for patients receiving cardio-selective beta adrenergic antagonists, that one be aware that the pulse may not change. Evaluation of the patient's symptoms and blood pressure can make the diagnosis of unintentional intravascular injection.

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(Accepted for Publication January 10, 1988.)

Anesthesiology
68:816-817, 1988

Nitrous Oxide and the Greenhouse Effect

To the Editor:—In recent years, much attention has focused on the possibility that N_2O is a harmful pollutant in the operating room environment. Consequently, modern anesthesia machines are equipped with scavenging systems designed to vent N_2O and other gases to the external atmosphere. It has come to our attention that, while this practice certainly reduces the exposure of operating room personnel to possibly harmful anesthetic gases, it does not prevent us from contributing to the exponentially increasing concentration of N_2O in the global atmosphere.

In the last decade, several meteorological studies have suggested that N_2O is becoming a major atmospheric pollutant with potentially serious consequences.[1–4] First, along with CO_2, N_2O traps thermal radiation escaping from the earth's surface contributing to the "greenhouse" effect that is thought to be responsible for the alarming warming trend in the global climate.[2] Second, N_2O destroys ozone through a series of chemical reactions that occur in the upper atmosphere.[4] Concern over depletion of stratospheric ozone, which protects all life on the surface of the earth from the deleterious effects of ultraviolet radiation, has risen considerably in the last few months.* Measurements of the ozone level in areas of the antarctic stratosphere revealed that the concentration was only 3% of the seasonal norm.* Thus, it is important to consider whether

* Lemonick MD: The heat is on. Time 130:58–63+, Oct. 19, 1987

current anesthetic practices could be contributing to this global long-term problem.

By far, most anthropogenic N_2O is released from the denitrification of agricultural fertilizers and the combustion of fossil fuels. It is estimated that these processes produce approximately 10×10^{10} moles of N_2O each year.[1] While precise figures for the utilization of N_2O as an anesthetic are not available, it is instructive to develop a rough estimate. If half of the 2.1×10^7 surgical procedures performed yearly in the U. S. A.† were each carried out with N_2O flowing at 2 l/min for a duration of 2 h, this would result in the venting of 1.3×10^8 moles of N_2O yearly. Considering that the number of anesthetics per capita worldwide is less than in the U. S. A. and the use of N_2O is limited primarily to industrialized countries, the worldwide use of N_2O may approximate five times that of the U. S. A. If so, total release of N_2O to the atmosphere could be in the range of $0.5–1.0 \times 10^9$ moles/year or less than 1% of the total global production of N_2O.

While this figure seems to minimize the contribution of anesthesia to atmospheric N_2O, we should not become complacent. Excessive atmospheric pollution could well disturb the delicate balance between N_2O production and N_2O absorption by natural geological and atmospheric "sinks."[1] Given the fact that N_2O has an extremely long transit time in the atmosphere of over 100 years,[1,2] future N_2O emissions could have real impact.

† Personal Communication. American Hospital Association, Chicago, IL.

It is clear that N_2O continues to find merit as an important component of current anesthetic practice and the theoretical considerations presented here should not outweigh the benefit of its use in a particular setting. Nevertheless, as more becomes known about the effects of N_2O on the ozone layer, it may become prudent to install systems to decompose or absorb the N_2O contained in scavenged anesthetic gases. In the meantime, we suggest that environmental pollution with N_2O should be minimized by using low-flow anesthetic techniques whenever feasible.

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4. Marland G, Rotty RM: Greenhouse gases in the atmosphere: What do we know? J Air Pollution Control Soc 35:1033, 1985

(Accepted for publication January 10, 1988.)

Anesthesiology
68:817–818, 1988

A Simple Technique to Eliminate Needle Stick Injuries

To the Editor:—Needle stick injuries are an occupational hazard for anesthesiologists. Most needle stick injuries occur when the needle is being recapped.* Furthermore, the fluid in intravenous tubing should be considered contaminated because of possible previous backflow of blood.[1] Any needle used to administer medicines into intravenous tubing should also be considered contaminated. The Center for Disease Control has recommended that forceps should be used to recap needles,[2] but the naked, contaminated needle is still dangerous. We suggest the following technique to eliminate contaminated needles.

The anesthesiologist needs two designated areas in the operating room. A table in the operating room is usually designated the clean area. It is not to be touched by contaminated gloves, and is a distance away from the operative field or any contaminated substances. Needles are kept only on the clean area, and are for mixing

* McCray E, Winslow N, Solomon SL, Martone WJ, Onorato IM, Munn VP: Prospective evaluation of health-care workers with parenteral or mucous-membrane exposure to blood from patients with acquired immunodeficiency syndrome. International Conference on AIDS, Atlanta, GA, April 14–17, 1985