

midity as high as 60 per cent. Cushions on the anesthetist's stool should not be permitted. If metallic electrical connection is to be maintained between the patient and the gas machine, the conductor should be placed at a distance from the breathing tubes and mask. It must be so arranged that it need never be disconnected while explosive gases are present. Woolen blankets and silk woolen outer garments should never be allowed near the explosive gases. Undergarments of either silk or wool do not constitute an electrical hazard. If the patient, the gas machine (the operating table), and the anesthetist are so intercoupled electrically that sparks cannot occur between them, the major portion of all electrostatic potentials having dangerous possibilities is eliminated. . . . The majority of (recent) explosions presumably initiated by static spark would have been prevented by (high resistance) intercoupling."

J. C. M. C.

ROWELL, GLENN: *Hospital Fire Hazards*. Hospitals 14: 91-94 (Aug.) 1940.

"There is no department in a hospital where the need of safeguards is so essential as the operating room. The danger of explosion, possibly resulting in fire, of combustible anesthetics mixed with air and oxygen or nitrous oxide have been known since the first use of ether anesthesia by inhalation, but in spite of this many hospitals have done nothing to lessen the hazard involved. The patient under anesthesia is entirely helpless and, therefore, wholly dependent upon the operating room staff, yet many members of these staffs still are laboring under a false sense of security due usually to the use of some small preventative measure that they may have taken. One thing to be remembered is that explosive gases such as cyclopro-

pane, ethylene, ethyl chloride and ether cannot be used without hazard even though every reasonable precaution has been taken. All we can do is lessen the hazard involved by making use of as many safeguards as we possibly can. . . . Recently, the fact that explosions of anesthetics do occur has become public knowledge and as a result a good many hospitals have already attempted to lessen the hazard. The majority of these explosions have three causes: (1) the discharge of static electricity; (2) the cautery; and (3) the use of improper electrical equipment. Static electricity without a doubt has been the principal offender and is also the most difficult to control. The danger of its accumulating in sufficient quantities to form a spark hot enough to ignite these gases may be eliminated to a large degree by proper humidification of the air. This requires maintaining a relative humidity of at least 60 per cent. which is comparatively simple during cold weather but necessitates the installation of both humidifying and cooling equipment during hot weather inasmuch as an operating room would be most uncomfortable with summer temperatures of 90 degrees or more and a relative humidity of 60 per cent. Many persons have thought that the humidity during summer months is sufficient to eliminate the formation of static, but experience has proved that this is not necessarily true as explosions so caused have occurred and tests made have shown inside relative humidities as low as 30 per cent. are possible even while it was raining outside.

"Humidifying equipment of many types is available today but care must be used to ascertain that the unit purchased is of the proper type of use in an operating room. . . . Static electricity is generated in many substances, some of the principal offenders being woolen blankets, the rubber tubing and

rebreathing equipment, nurses' clothing and last but not least the patient's hair. . . . It is safer to use cotton blankets for shock treatment of anesthetized patients. The passage of gases through the rubber rebreathing equipment generates static electricity which has been found to measure as high as 3,900 volts. This, of course, can only be controlled by the use of a material conductive of electricity instead of the rubber we have today. We can, however, safeguard the use of the present type of equipment by remembering the following suggestions. Keep the face mask dampened. Never remove the rebreathing bag without keeping a firm grasp of both the bag and the tubing to form an electrical path through your body for a sufficient length of time to bleed off any accumulated current. Care must be exercised when removing the face mask to assure an electrical path from the mask through your body to the patient's head. The clothing worn by nurses also has been responsible for explosions. Silk is the principal offender. Silk hose insulate the body. Some hospitals have reduced this hazard by furnishing special shoes with copper rivets through the soles and cotton stockings. Walking to and from the sterilizing equipment is often sufficient to generate a dangerous charge of static. Some hospitals are binding the hair of patients with a linen tape, turban fashion, to remove that hazard. Human hair when combed or stroked is a good generator of static. . . . Properly humidified atmospheres reduce the likelihood of static electricity forming in dangerous quantities because moist air permits the currents to bleed off to the ground before they are of sufficient magnitude to form a spark hot enough to ignite the gases. When you do have a means of controlling the humidity in your operating rooms be sure that you also have either an automatic means of

keeping the proper percentage of moisture in the air or an accurate instrument to measure the exact amount of moisture present. Equipment which cannot be depended upon to maintain proper conditions might be worse than none at all as it is sure to result in a false sense of safety. . . .

"[Other causes of fires and explosions in the operating room are] cautery, . . . improper electrical equipment, . . . electric clocks, . . . the surgical lamp, . . . motor driven equipment, . . . smoking, . . . X-ray films, . . . [and] oxygen . . . under pressure."

J. C. M. C.

ALVAREZ, W. C., AND MASON, A. Y.: *Results Obtained in the Treatment of Headache with the Inhalation of Pure Oxygen*. Proc. Staff Meet., Mayo Clin. 15: 616-618 (Sept. 25) 1940.

"A report is made of the results obtained with the inhalation of practically undiluted oxygen by ninety-seven persons suffering from headache. In cases of apparently typical migraine, 42 per cent. of the patients were completely relieved, 44 per cent. more were helped, 2 per cent. obtained delayed relief, and 12 per cent. obtained no help. In the case of patients with headache almost certainly not migrainous in character none was completely relieved during the treatment, 16 per cent. got relief on the way home, and 24 per cent. were helped while breathing oxygen. In the case of those persons with headaches of doubtful origin only 33 per cent. were helped. Apparently, then, when the headache is migrainous, there are about four chances in five that the inhalation of oxygen will relieve the patient, and when the headache is not migrainous there is only about one chance in three that this treatment will help. The results appeared to be better with prompt