REPORT OF SCIENTIFIC MEETING

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Anesthesia in the Field

The Charleston Area Medical Center and West Virginia University sponsored the "Anesthesia in the Field" conference on March 14, 1987, at the West Virginia University Medical Center in Charleston. The meeting focused on the application of anesthesia in the military-medical setting, and particular emphasis was placed on the use of the draw-over anesthesia apparatus. Although much of the discussion emphasized combat scenarios, a substantial portion of the information could easily be applied to anesthetic practice in third world countries or in civilian disasters in the United States.

Dr. Roderick K. Calverly presented one of the highlights of the meeting with a lecture and slide presentation on the history of draw-over anesthesia. Although draw-over anesthesia may be unfamiliar to many anesthesiologists, in reality, the concept is not new. In fact, John Snow was an early proponent of the draw-over anesthesia device. Interestingly, a model of a 100-year-old draw-over device incorporated many safety features familiar to anesthesiologists today, including a temperature-compensating water bath and an anti-tip design.

Dr. James Boland, Professor and Chairman of the Department of Surgery at the West Virginia University, Charleston Division, set the stage for the discussion of anesthesia under austere conditions with a video presentation. Dr. Boland emphasized the great number of casualties that could be expected in a military conflict and the extensive nature of the trauma produced by modern weapons.

Dr. Peter Baskett, from the United Kingdom, provided his perspective as a NATO ally on the use of draw-over anesthesia. He covered in some detail the British experience with draw-over anesthesia in the Falkland Island's campaign, indicating that the device performed quite well. Dr. Baskett also suggested that ketamine, because of its safety and versatility, deserved a larger role as an anesthetic agent in austere conditions, such as those found in the Falklands.

Lt. Fred Hill, NC USN CRNA, discussed the use of anesthesia in the relatively austere circumstances found on board a naval vessel. Although the operating rooms on naval vessels are well equipped, the equipment must be meticulously inventoried and maintained because of problems with repair while at sea. As Lt. Hill explained, "... if the equipment breaks down in the middle of the Mediterranean, the 800 service number won't do you much good." In contrast to the relatively well-supplied environment on ships, Lt. Hill described his experience with a British field surgery team in Belize. Belize is a sparsely populated third world country in Central America, with a per capita income of less than $1,100. Lt. Hill used an Oxford miniature vaporizer unit to provide anesthesia for a number of surgical procedures, many of them intra-abdominal. The surgical team's resources were quite limited and, although every patient had an intravenous catheter placed, most patients were not given continuous intravenous infusions. To conserve the limited supply of intravenous fluids, the patency of the intravenous catheter was simply maintained with a small amount of heparinized fluid.

Josiah K. Lilly, M.D., focused his comments on intravenous anesthesia in the field setting, particularly the use of intravenous ketamine. Dr. Lilly described several advantages for ketamine anesthesia in the field. Ketamine is a very versatile agent with favorable aspects which substantially outweigh its side effects. The S+ isomer of ketamine could substantially enhance its role in anesthesia. Dr. Lilly described S+ ketamine as having greater potency, improved analgesia, and lesser excitement than the racemic ketamine now in use. Unfortunately, S+ ketamine is not yet economically viable for commercial production.

Dr. David Longnecker reviewed the clinical aspects of isoflurane anesthesia. Because much of the conference emphasized combat casualties, Dr. Longnecker stressed the importance of careful selection of anesthetic agents for the patient in shock. His comments took the form of answers to three questions. First, does the anesthetic agent used make a difference in the survival of a patient in shock? (Yes, this has been shown quite nicely in studies with hemorrhaged rats.) Second, what is the pathophysiological problem that must be addressed in the trauma victim in shock? (Blood flow to vital organs must be maintained.) And, third, is any one anesthetic agent better than the others? (Yes. Isoflurane appears to maintain cardiac output and perfusion of vital organs better than other inhalation agents.) Dr. Longnecker suggested that halothane not be used in the hypotensive trauma victim. His own animal data suggests that halothane blocks the normal inverse relationship between portal venous blood flow and hepatic artery blood flow and, thus, may render the hypotensive victim at risk for liver ischemia.

Dr. J. McGuinness discussed the use of anesthetic monitors in the field. He explained that the best monitor is the vigilance of the individual anesthetist, backed up by relatively simple devices, such as the precordial stethoscope and manual blood pressure cuff. Pulse oximeters may play a valuable role, especially when anesthetics are administered by minimally trained assistants. Pulse oximeters can also be very useful in conserving scarce supplies of compressed oxygen.

Cpt. Stephen Janny, CRNA, (Chief Nurse Anesthetist, 5th Mobile Army Surgical Hospital) described his experience with the draw-over anesthesia apparatus in settings ranging from a field hospital to the operating room at Womack Army Community Hospital. Cpt. Janny's experience covers over 1,000 anesthetics in patients aged from less than 6 weeks to over 70 yr, including obstetrical patients. Of particular interest were his comments on the use of oxygen concentrators in field locations. Through the use of oxygen concentrators, many of the problems associated with the filling and transport of oxygen cylinders can be eliminated.

In the panel discussion that followed the formal presentations, the speakers were joined by Drs. Mosebar and Funk, Medical Planner in the Department of Defense. The questions from the audience addressed the reliability of some of the anesthesia equipment in harsh field conditions. They were assured that items have performed both reliably and safely.

The next Anesthesia in the Field conference is tentatively scheduled for spring, 1988.