as a signal source for artificial intelligence expert systems being designed for respiratory care. However, this developer has offered the simulation as the core for other computer applications. C. F. McKenzie presented plans, currently under review for funding, for the development of an expansive trauma anesthesia simulator. This computer simulator would be driven by the Sleeper® model and will be designed to teach the fundamentals of shock trauma evaluation, resuscitation, and anesthesia. When added to interactive video technology, this simulator could be used to teach sophisticated principles of shock trauma to physicians and military personnel involved in the medical care of the trauma patient.

The entire history of computer-aided teaching in anesthesiology from Gas Man® to plans for a comprehensive shock trauma interactive simulator was represented at this landmark meeting. The giant leaps in computer technology, including computer tools for human interfacing, artificial intelligence, and neural networks have demonstrable potential in the future practice of anesthesiology. More attention can be paid to the contents "taught" by these devices and their role in our educational structure rather than the typical preoccupation with the computers themselves characteristic of the past. Most importantly, it is clear that the time and effort devoted to designing, building, and validating such simulators, as well as the challenge of pioneering their applicability and acceptance in anesthesiology, has created a new academic endeavor requiring our attention and recognition.

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The American Society of Clinical Oncology (ASCO) is to medical and surgical oncologists what the ASA meeting is to Anesthesiologists. This is the meeting where clinical oncologists can gather with bench research experts to share the latest information in a diverse field that is expanding exponentially. Of the 1,334 papers that were presented, there was a small but well-defined group relevant to anesthesiologists. What was particularly gratifying to anesthesiologists in attendance was the overwhelming interest that clinical oncologists showed with regard to possible contributions that anesthesiologists could make to the care of cancer patients. The papers pertinent to anesthesiology could be divided into two major categories: problems related to pain control in terminal cancer patients and problems related to perioperative management of patients undergoing surgical treatment for cancer.

Oral morphine is often used as the first-line therapeutic modality for terminal cancer pain control, and a sustained-release preparation is widely employed for this purpose. R. Dalton (Rochester, Minnesota) compared three oral doses (30, 60, and 90 mg) of sustained release morphine to 30 mg of immediate release oral morphine. The 30- and 60-mg sustained-release doses were found not to differ significantly from immediate-release morphine either in toxicity or duration of action. By contrast, the 90-mg dose of sustained-release morphine improved analgesia but, at the same time, increased the risk of toxicity as compared with 30 mg of immediate release morphine. R. J. Osbome (London, England) examined the analgesic activity and metabolism of synthetic morphine-6-glucuronide (M-6-G), a morphine metabolite in humans. M-6-G was found to be tenfold more potent than morphine. It was concluded that M-6-G contributes to the clinical effects of morphine treatment and that its elimination was found to be reduced in renal failure, thus explaining increased morphine sensitivity in azotemic patients. Alternative analgesics were also presented. Z. P. Bernstein (Buffalo, New York) studied proglumide, a cholecystokinin antagonist. It was found to act as an opioid agonist in a double-blind cross-over trial comparing the efficacy of patients' usual opioid regimen with a regimen that included proglumide and a reduced opioid dose.

Alternative routes of opioid administration are likewise being pursued for pain relief in cancer patients. R. F. Kaiko (Norwalk, Connecticut) compared the bioavailability of oral *versus* rectally administered morphine. The extent of morphine absorption was found to be similar, but the maximal concentration achieved was delayed and somewhat attenuated, suggesting reduced absorption *via* the rectal route. There was no difference in the side effects between the two routes of administration. B. Kinzbrunner (Broward County, Florida) reported on the use of morphine suppositories for terminally ill cancer patients who could not take oral medications. He concluded that morphine suppositories were as effective as morphine taken by the oral route and it was not necessary to change to parenteral morphine when patients could not take oral medication. S. Hassenbusch (Cleveland, Ohio) evaluated continuous epidural morphine infusion in 65 terminally ill cancer patients, confirming other reports that the technique was effective and had a suitably low risk benefit ratio. Patient-controlled analgesia (PCA) has also proven to be useful, according to I. G. Kerr (Toronto, Canada). He reported on successful use of outpatient infusion of opioids *via* a PCA pump in patients whose pain was suboptimally controlled with more conventional methods. Another approach, Transdermal Therapeutic System (TTS) was described by M. A. Simmonds *et al.* (Hershey, Pennsylvania). TTS fentanyl was administered to 39 patients with advanced cancer. Patient compliance and acceptance were rated as excellent. Some tolerance to TTS was noted over the 1-month trial, but overall it was felt to be a useful adjunct for achieving pain control in advanced cancer patients.

Nausea, vomiting, and anxiety remain the major side effects of chemotherapy administration. M. Citron (New Hyde Park, New York), using a placebo-controlled double-blind crossover trial found no advantage in early administration of droperidol to control chemotherapy-induced nausea and vomiting as compared with giving droperidol just 1 h before chemotherapy. L. M. Potanovich (New York, New York) evaluated the efficacy of five different doses of midazolam as adjuncts to antiemetics in patients receiving cancer chemotherapy. They found 0.04 mg/kg of midazolam to be optimal with regard to minimal side effects and brevity of action.

The use of Celiac Plexus Block (CPB) remains controversial in cancer pain management. W. Sharfman (Cleveland, Ohio) reviewed 17 published series in an attempt to determine whether

neurolytic CPB has been adequately evaluated for the management of pancreatic cancer pain. He concluded that the available data are insufficient to judge either efficacy, morbidity, or cost effectiveness. In contrast, S. Jain (New York, New York) found a high degree of success when CPB was performed specifically for upper abdominal pain due to well-localized pancreatic cancer and pancreatic cancer with metastasis only to liver. More importantly, he noted that CPB was ineffective in relieving pain related to diffuse abdominal metastatic disease, thus perhaps explaining the less than uniformly positive results obtained in previous series.

The psychologic toll of cancer pain was addressed in two papers. D. Saltzburg (New York, New York) studied the relationship between pain, depression, and suicidal ideation in 185 cancer patients. Although suicidal ideation was strongly related to depression and mood disturbance, it was found to be only indirectly related to pain. However, when patients' perception is that they are experiencing poor pain relief, this is associated with increased suicidal ideation. D. Weissman (Milwaukee, Wisconsin) observed a high incidence of inappropriate cancer pain attitudes among first-year medical students. It was recommended that cancer pain education be part of an ongoing medical school curriculum in both preclinical and clinical years.

Advances in oncologic therapy have increased the life span of cancer patients; hence, they present complex problems with regard to perioperative anesthetic management. B. Lichtiger (Houston, Texas) demonstrated the usefulness of autologus transfusions in surgical oncology. From a study of 235 patients they found that the majority of patients could undergo surgery without needing homologous blood. With due precautions, they felt that autologus transfusions should be considered as a viable option for patients undergoing cancer surgery. M. Wiebman (New York, New York) evaluated the role of preoperative chest x-rays (CXRs) in the perioperative management of 734 cancer patients. There was a 29% incidence of clinically significant CXR abnormalities, 18% of which were new, unsuspected findings, usually related to the extent of tumor involvement. They also examined the importance of the CXR findings in perioperative cardiorespiratory care. Prospectively the anesthesiologists predicted that the CXR findings would influence perioperative cardiorespiratory care in 24% of cases, yet in actuality, this occurred in only 5% of the patients. It was concluded that in cancer patients, routine preoperative CXRs are of minimal assistance to anesthesiologists, but are of considerable value to surgical oncologists.

Adriamycin is a mainstay of chemotherapy at present, yet it induces a dose-dependent cardiomyopathy that can be problematic for anesthesiologists. L. Steinhertz (New York, New York) examined cardiac toxicity 4–20 yr after completing anthracycline therapy in 201 patients. Using echocardiography she found that the total adriamycin dose received correlated with subsequent abnormal cardiac findings. Because delayed myocardial fibrosis is a common finding, however, it was concluded that these patients should have long-term cardiac function follow up to detect late abnormalities of contractility and rhythm. Anesthetizing adriamycin-exposed patients was addressed by A. C. Thorne (New York, New York), who compared fentanyl-N_2O *versus* isoflurane-N_2O in anthracycline treated patients. Fentanyl-N_2O was shown to be more likely to cause unfavorable hemodynamic changes, primarily due to maintenance of a high peripheral vascular resistance. In contrast, isoflurane-N_2O maintained more optimal cardiovascular performance in this group of patients.

Other chemotherapeutic agents also impact on perioperative anesthetic management. M. McKeage *et al.* (Wellington, New Zealand) found carbon monoxide diffusing capacity to be a poor predictor of clinically significant bleomycin pulmonary toxicity. In contrast, he noted that clinical assessment and chest x-rays were valuable adjuncts in evaluating patients with this disorder. O. G. Jonsson (Dallas, Texas) examined renal toxicity after patients had been treated with ifosfamide. Among 12 pediatric patients studied, all demonstrated some degree of renal dysfunction, mainly tubular toxicity resembling Fanconi's syndrome.

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