

*The Johns Hopkins Medical Institutions
600 North Wolfe Street
Baltimore, Maryland 21205*

On Narcotism by the Inhalation of Vapours. BY JOHN SNOW. A facsimile edition with an introductory essay by Richard H. Ellis. London, Royal Society of Medicine Services Ltd., 1991. Pages: xxx (introduction) + 112. Price: £20. (Original edition: London, Wilson and Ogilvy, 1848.)

John Snow published a series of 18 articles in the London Medical Gazette between 1848 and 1851, each with the same title: "On Narcotism by the Inhalation of Vapours." He collected and republished them between 1848 and 1852 as three pamphlets, retaining the name of the original articles as the title of the pamphlets. The present book is a facsimile edition of these rare pamphlets and includes a thoughtful and scholarly introductory essay by Dr. Richard H. Ellis.

This remarkable publication demonstrates Snow's clear understanding, on a level not again attained until fairly modern times, of ideas and concepts that underlie the rational practice of anesthesia. The simple yet sound experimental techniques that he used are extensively described and cannot fail to arouse profound admiration in readers in our era. These pamphlets include topics for individuals with interests in a wide variety of areas of modern anesthesia, such as uptake and distribution of inhalation anesthetics, pulmonary function and cardiovascular function during anesthesia, metabolic effects of volatile anesthetics, and problems in clinical anesthesia. Of course, Snow was not always correct in his conclusions, as judged by modern standards, but he was right much more often than he was wrong and exhibited a keen intuitive ability to evaluate evidence. His skill and experience as a clinician, as revealed in his discussions of clinical case material, are still worthy of note today. Snow's carefully presented analysis of the early deaths from chloroform were a highly significant factor in convincing his medical contemporaries that anesthetic deaths were preventable and were due to improper anesthetic technique rather than to some mysterious ill-defined idiosyncrasy. The substantial early resistance to use of anesthetics must have been thus considerably minimized. Much of the material in these pamphlets also is dealt with in Snow's 1858 book "On Chloroform and Other Anaesthetics."

It would have been helpful if substances that are mentioned and discussed by Snow in the text and are likely to be unfamiliar to today's readers, such as "Dutch Liquid" and "Olephant Gas," were identified in modern chemical terms in the introduction.

This attractive and nicely printed volume should join Snow's other books, "On the Inhalation of the Vapour of Ether in Surgical Operations" (1847) and "On Chloroform and Other Anaesthetics" (1858) (both of which are available in facsimile editions) on the bookshelves of individuals and anesthesia departments with an interest in and a concern for the origins of modern anesthesia.

NORMAN A. BERGMAN, M.D.
*Clinical Professor of Anesthesiology
Oregon Health Sciences University
3181 S.W. Sam Jackson Road
Portland, Oregon 97201*

Drug Infusions in Anesthesiology. EDITED BY ROBERT J. FRAGEN, M.D. Raven Press, New York, 1991. Pages: 226. Price: \$82.

In the preface, Fragen states: "This book should provide an understanding of how the delivery of drugs by intravenous infusion can optimize therapy, the methods of drug delivery by infusion, and the drugs amenable to administration by this route." In accordance with Fragen's clear statement of purpose, this book delivers the information he set out to convey in a relatively concise, easy-to-read, and very understandable fashion. The timeliness of the subject is linked to the

development of drugs with shorter durations of effect and more rapid clearances as well as the evolution of infusion pump technology, which has led to the increasing use of drug infusions in the perioperative period.

Drug Infusions in Anesthesiology provides the reader with an in-depth yet quite understandable discussion of the pharmacokinetic considerations and advantages of continuous drug infusions. More specifically, the pharmacokinetic and pharmacodynamic considerations of the agents commonly in use for "total intravenous anesthesia" (TIVA) are discussed in detail. This information is nicely integrated with a review of intravenous drug delivery systems. TIVA is clearly the major theme of this text. The reader will be left with a historical perspective of the evolution of TIVA, the rationale for its use, very specific recommendations and guidelines for administration, and an up-to-date review of the rapidly accumulating TIVA literature. The appendix provides a series of tables as a ready reference to drug doses, which I am sure will be extremely helpful to today's practicing anesthesiologists in the operating room, particularly those who were reared in the "inhalation anesthesia era."

The book is divided into eight chapters, two of which were written by Fragen and the others of which were written by colleagues at Northwestern University and at Duke University Medical Center. All authors convey a spirit of enthusiasm and interest in this rapidly evolving era of intravenous anesthesia. The first six chapters pertain specifically to TIVA.

The first chapter, "General Principles of Drug Infusions," discusses basic pharmacokinetic and pharmacodynamic principles necessary to understand the dose-response relationship of intravenous anesthetics, specifically those with high elimination clearance. The importance of the method of drug administration to optimize efficacy while minimizing toxicity is clearly presented, as is the rationale for TIVA. This is illustrated by an extreme example of the potentially disastrous consequences of large-bolus drug administration: the numerous anesthetic-related deaths of acutely hypovolemic Pearl Harbor casualties who received large bolus doses of "short-acting barbiturates," which were more a consequence of the method of drug administration rather than of inherent drug toxicity. This chapter develops from a basic discussion of the dose-response relationship into a rather complex discussion of combined pharmacokinetic-pharmacodynamic models of various drug infusion schemes and would probably be interesting for the accomplished pharmacologist as well as the practicing anesthesiologist.

The second chapter, "Intravenous Drug Delivery Systems," discusses drug delivery systems conventionally used to administer drugs intravenously by continuous infusion. Beginning with a historical perspective and discussion of manual infusion devices, the author goes on to describe the essential features for infusion devices and desirable features for infusion pumps, and then critically discusses several commercially available calculator pumps that are suitable for intravenous anesthetic drug infusions. This section will serve as an unbiased guide to the currently available calculator pumps for the anesthesiologist who is attempting to decide which of these highly sophisticated but expensive devices to purchase. Various drug infusion schemes are discussed, both in the context of currently available infusion pump delivery systems as well as that of more futuristic automatic feedback control systems. A somewhat extended discussion of transdermal drug delivery, focusing on the transdermal fentanyl patch, seems somewhat out of context at the end of this chapter.

Chapters 3, 4, 5, and 6 provide the real "meat and potatoes" to the practicing anesthesiologist looking for a practical guide to TIVA administration. Chapter 3, "Infusions of Intravenous Anesthetics," concentrates on the continuous intravenous administration of propofol, midazolam, etomidate, methohexital, thiopental, and ketamine. Chapter 4, "Opiate Infusions," updates the clinician on the role of opiate infusions, specifically the fentanyl analogs fentanyl, alfentanil, and sufentanil, in anesthetic techniques and discusses the principles behind

intravenous infusion protocols for these drugs, elucidating the pharmacokinetic differences between these opiates in providing the rationale for infusion schemes. Chapter 5, "Muscle Relaxants," provides guidelines for continuous infusions of neuromuscular blocking agents, specifically succinylcholine, mivacurium, atracurium, and vecuronium, after a more generalized discussion of neuromuscular blockade. Chapter 6, "Total Intravenous Anesthesia," attempts to assimilate the three previous chapters in describing the advantages, disadvantages, and indications for specific TIVA techniques by reviewing pertinent published literature.

Chapters 7 and 8 then deviate significantly from the previously cohesive TIVA theme. Chapter 7, "Postoperative Analgesia: Management with Continuous Infusion," stands by itself as a well-written, rather inclusive review of current techniques for postoperative pain management, focusing on the role of infusions of analgesic agents. Topics include continuous infusion of opiates, patient-controlled analgesia (discussed in detail), transdermal fentanyl (redundant after its discussion in Chapter 2), and epidural analgesia. The shortcoming of this chapter is that unlike the previous chapters there is only sparse mention of the exciting new infusion pump technology as it pertains to the administration of the techniques discussed. Epidural patient-controlled analgesia is discussed in a cursory manner. In contrast, intrapleural analgesia is discussed at length and may be somewhat out of context in this book.

Chapter 8, "Vasoactive Drugs," deviates even further from the previously cohesive TIVA theme in attempting to discuss cardiovascular physiology, receptor physiology, the entire spectrum of positive ino-

tropic and chronotropic drugs, vasoconstrictors and vasodilators, and negative inotropic and chronotropic drugs, and in concluding with a decision-making algorithm for low cardiac output states—all in one chapter. Although this chapter is well-written for its content, again there is no attempt to discuss the subject matter in the context of new infusion technology.

In conclusion, *Drug Infusions in Anesthesiology* provides the reader with a basic understanding of the pharmacologic rationale and considerations in the administration of TIVA and presents practical guidelines for drug infusions. I agree with Fragen's statement that "this book should stimulate readers to incorporate more drug infusions into their practice." The editor also humbly recognizes, in creating the first textbook of its kind devoted entirely to drug infusions in anesthesiology as we enter this exciting new era of intravenous anesthesia, "that the information presented here may be the tip of the iceberg compared with what may be available a few years from now."

JEFFREY A. GRASS, M.D.

Assistant Professor

Director, Acute Pain Service

Department of Anesthesiology and Critical Care Medicine
Johns Hopkins Hospital

Meyer 294

600 North Wolfe Street

Baltimore, Maryland 21205

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The Laboratory Investigation by Eleff *et al.* in the January, 1992, issue (Eleff SM, Schleien CL, Koehler RC, Shaffner DH, Tsitlik J, Halperin HR, Rogers MC, Traystman RJ: Brain bioenergetics during cardiopulmonary resuscitation in dogs. *ANESTHESIOLOGY* 76:77-84, 1992) contained an error. The first line of the abstract (p 77) should read, "Cardiac arrest causes a rapid loss of cerebral adenosine triphosphate (ATP)" (not triphosphatase) and the second column (Introduction), line 15, should read, "Adenosine triphosphate (ATP)" (not triphosphatase).

In the Letter by Katsnelson *et al.* published in the January, 1992, issue (Katsnelson T, Frost EAM, Farcon E, Goldiner PL: When the endotracheal tube will not pass over the flexible fiberoptic bronchoscope. *ANESTHESIOLOGY* 76:151-152, 1992), the following sentence was omitted: "Drs. Katsnelson *et al.* gratefully acknowledge the assistance of Dr. Raghubar Badola in providing the illustrations."