

## Transcutaneous PO<sub>2</sub> poorly estimates arterial PO<sub>2</sub> in adults during anesthesia

Nathan L. Pace, Theodore H. Stanley, Kirk P. Andriano, Johan Wilbrink and Prisca Zwanikken  
*University of Utah School of Medicine, 50 North Medical Drive, Salt Lake City, UT 84132, USA*

**Keywords:** Equipment, monitoring, oxygen, oxygen tension, arterial, transcutaneous

### Abstract

We compared values of P<sub>a</sub>O<sub>2</sub> and transcutaneous PO<sub>2</sub> in 21 adult patients during anesthesia. In 282 simultaneous determinations during anesthetic periods of 3–10 h, transcutaneous PO<sub>2</sub> was a poor predictor of absolute P<sub>a</sub>O<sub>2</sub> and changes in P<sub>a</sub>O<sub>2</sub>. Transcutaneous PO<sub>2</sub> monitoring in adults during anesthesia is of unproven value.

### Introduction

Gas exchange through the skin was first demonstrated experimentally in 1851 (9). One hundred years later, the measurement of respiratory gases through the skin was accomplished (1). The measurement of transcutaneous PO<sub>2</sub> (T<sub>s</sub>PO<sub>2</sub>) has become accepted as a useful tool for the management of the sick neonate (2, 12). Investigators, using a variety of transcutaneous sensors, have also suggested that frequent T<sub>s</sub>PO<sub>2</sub> measurements can provide important information on P<sub>a</sub>O<sub>2</sub> values and P<sub>a</sub>O<sub>2</sub> trends in adults (5, 7, 14, 16, 18, 20). Several reports have found T<sub>s</sub>PO<sub>2</sub> monitoring of adults under anesthesia to be valid and useful and have recommended their routine use in the operating room (3, 13, 17, 9). By contrast, Knill *et al.* (8) found non-invasive oximetry to be a more suitable monitor of arterial oxygenation than T<sub>s</sub>PO<sub>2</sub>. The

object of this study was to better define the relationship between arterial and transcutaneous oxygen tensions during the perioperative period in adult patients.

### Methods and materials

After approval of the research protocol by the Institutional Review Board of the University of Utah Medical Center, 21 patients aged 21 to 75 years scheduled for elective surgery were entered into the study after giving written, informed consent. Patients were studied in the operating room and the recovery room during and after general anesthesia. The anesthetic drugs were chosen at the discretion of the attending anesthesiologist with the exception that no patient received halothane.

On to each patient were placed two transcutaneous oxygen sensors; each sensor was connected to an identical monitor (Critikon Model 8030 Oxygen Monitor, Critikon Inc, Tampa, Flor-

*Address for offprints:* Nathan L. Pace, M.D., Department of Anesthesiology, 50 North Medical Drive, Salt Lake City, UT 84132, USA.

# Transcutaneous Po<sub>2</sub>

**J Elliott**



## **Transcutaneous Po<sub>2</sub>:**

*Handbook of Non-Invasive Methods and the Skin* Jorgen Serup, Gregor B. E. Jemec, Gary L. Grove, 2006-02-23 With contributions from prominent experts this comprehensive handbook covers the field of non invasive biophysical measurement methods in clinical and experimental dermatology Structured to provide both educational and practical information the book has proven to be of value to both young researchers and senior scientists All coverage of major evaluation and measurement methods share a consistent format covering scope sources of error application and validity The second edition incorporates 69 revised chapters and 95 new chapters covering topics such as computer technique imaging techniques skin friction barrier functions and more Continuous Transcutaneous Monitoring Albert Huch, Renate Huch, Gösta Rooth, 2013-03-09 The interna ti ona l symposi a on transcutaneous monitori ng have dea It with the interaction between ideas and research the introduction of unconventional techniques into clinical practice and the joint efforts of researchers clinicians and industry to design and manufacture prac tical equipment for noninvasive monitoring The First International Symposium on Continuous Transcutaneous Blood Gas Monitoring took place in Marburg West Germany from May 31 to June 2 1978 This was the first major international meeting exclusively devoted to transcutaneous blood gas monitoring and it was attended by the scientists who had developed this technique or had been Jorking with it by a large number of doctors mainly neonatologists who had just begun to use the technique or hoped to do so and finally a rather large number of representatives of industry The second symposium with the same title was held in Zurich Switzerland October 14 16 1981 This time the focus was to a large extent on transcutaneous PCO<sub>2</sub> monitori ng for whi ch equipment had become 2 commercially available only a short time before Fetal monitoring was also discussed at length as was the use of the transcutaneous techniques in other fields such as vascular surgery and experimental animal research The third symposium October 1 4 1986 was again held in Zurich It Jas entitled Continuous Transcutaneous Monitoring indicating that not only blood gases but also other parameters could be monitored trans cutaneous ly Bioinstrumentation and Biosensors Donald L. Wise, 1991-01-31 This reference text consists of contributed chapters by specialists directly carrying out research and development in this emerging field which joins advanced microelectronics with modern biotechnology Chapters present novel biotechnology based microelectronic instruments such as those used for de **Clinical Blood Gases** William J. Malley, 2004-08-04 This text provides a thorough resource on arterial blood gases covering the full scope of applications This book is the first of its kind to focus on the needs of educators students and practitioners alike The new edition has been completely updated providing the latest information from the field including facts on technical issues basic physiology clinical oxygenation clinical acid base non invasive techniques just to name a few Instructor resources are available please contact your Elsevier sales representative for details This book s amazing content coverage offers a wealth of useful material including illustrations tables examples and case studies This new edition is up to date with the latest in technology and

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