I. Quantitative aspects. Acta Physiol Scand 81:557–564, 1971
12. Albuquerque EX, McIsaac RJ: Fast and slow mammalian muscles after denervation. Exp Neurol 26:183–202, 1970
13. Kendig JJ, Bunker JP, Endow S: Succinylcholine-induced hyperkalemia: Effects of succinylcholine on resting potentials and electrolyte distributions in normal and denervated muscle. ANESTHESIOLOGY 36:132–137, 1972
14. Gronert GA, Lambert EH, Theye RA: The response of denervated skeletal muscle to succinylcholine. ANESTHESIOLOGY 39:13–22, 1973
15. Mond R, Netter H: Ändert sich die Ionenpermeabilität des Muskels während seiner Tatigkeit? Pfluegers Arch 224:702–709, 1930
16. Houssay BA, Marenzi AD: Fixation du potassium injecte dans la circulation sanguine. CR Soc Biol 126:613–616, 1937
17. Fenn WO: The fate of potassium liberated from muscles during activity. Am J Physiol 127:356–373, 1939
18. Houssay BA, Marenzi AD: Fijacion del potasio inyectado en la sangre circulante. Rev Soc Argent Biol 13:139–151, 1937
19. Hegab E, Schiff HI, Smith DJ, et al: An electron microscopic study of normal and chronically denervated rat skeletal muscle following succinylcholine challenge. Anesth Analg (Cleve) 53:650–656, 1974
20. Dietz AA, Rubenstein HM, Lubrano T: Colorimetric determination of serum cholinesterase and its genetic variants by the propionyl-thiocholine–dithiobis (nitrobenzoic acid) procedure. Clin Chem 19:1309–1313, 1973

Oxygen Toxicity

OXYGEN AND MUCOCILIARY CLEARANCE The authors showed previously that an early sign of pulmonary oxygen toxicity in man is suppression of tracheal mucous velocity. This paper reports the effects of oxygen concentration and time in altering mucociliary clearance. Dogs were anesthetized with pentobarbital. Control animals breathed air (100 per cent humidity, 38 C) for as long as 30 hours. Three different groups of dogs received 50, 75, and 100 per cent oxygen (100 per cent humidity, 38 C) for 6–30 hours. Respiration was assisted by transvenous phrenic-nerve stimulation so as to maintain adequate alveolar ventilation while avoiding positive pressure to the airway. Tracheal mucous velocity was decreased significantly by 45, 66, and 84 per cent in dogs breathing 100 per cent oxygen for 2, 4, and 6 hours, respectively. Significant changes in mucous velocity were not observed in animals breathing 75 per cent oxygen until 9 hours had elapsed. Decreases of 42 and 78 per cent were observed at 9 and 12 hours. Dogs breathing 50 per cent oxygen showed an initial increase in tracheal mucous velocity of 66 per cent at the end of 6 hours. An increase of 49 per cent was observed at 12 hours. After 24 and 30 hours of exposure, significant decreases of 20 and 51 per cent were measured. In dogs breathing 100 per cent oxygen for six hours or 75 per cent oxygen for 12 hours, acute inflammation of the trachea and bronchi was seen. Histologically, necrosis and desquamation of epithelium could be observed. Minor changes were seen in both the control group and dogs breathing 50 per cent oxygen for 30 hours. The data again call attention to the potential hazard of oxygen administration. (*Sackner MA, and others: Effect of oxygen in graded concentrations upon tracheal mucus velocity: A study in anesthetized dogs. Chest 69:164–167, 1976.*) ABSTRACTER'S COMMENT: A definite explanation for the increase in mucociliary clearance during the early hours of inhaling 50 per cent oxygen is not given. It is not clear whether this represents potential harm. The data again suggest that except in the neonate, inhalation of less than 50 per cent oxygen is largely devoid of risk.