

THE LUNG AND ITS  
DISORDERS IN  
THE NEWBORN  
INFANT

THIRD EDITION

*Volume I in the Series*

MAJOR PROBLEMS IN  
CLINICAL PEDIATRICS

AVERY and FLETCHER

# THE LUNG AND ITS DISORDERS IN THE NEWBORN INFANT

*Third Edition*

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# Foreword

Everyone who has any interest in neonatology is acquainted with Dr. Mary Ellen Avery's *The Lung and Its Disorders in the Newborn Infant*. This was the original volume in our series entitled *Major Problems in Clinical Pediatrics*. Published in 1964, its excellence was of a quality all our subsequent contributors have tried hard to attain. By 1968 Dr. Avery deemed it outdated, so rapidly had new knowledge in the field accrued, and her second edition became available. Now, five years later, she feels constrained to update it and revise it once more, for the same good reasons.

This time she has enlisted the help of Dr. Barry D. Fletcher. Dr. Fletcher is an Assistant Professor of Radiology at McGill University and Radiologist at the Montreal Children's Hospital. He received his earlier training in the Radiology Department of the Johns Hopkins Hospital, focusing his interest largely upon infants and children. With his expert assistance, the radiographic illustrations, so very important a part of a work of this nature, have been augmented in number, selected with even greater care, and reproduced with more precision.

Again the authors have come up with "the last word" on this subject.

ALEXANDER J. SCHAFFER, M.D.

# Preface to the Third Edition

Why a third edition? The answer is that observations made on infants and laboratory studies in the past five years are of such significance that they deserve to be collected in one place; the student who confines his reading to the second edition would be lacking some very important information, particularly in the area of artificial respiration; and finally, I enjoy the opportunity to read critically and try to understand events in a rapidly moving specialty.

This edition allows me to introduce a new author, Dr. Barry Fletcher. In both previous editions I relied heavily on the advice of first Dr. Olga Baghdassarian, and later Dr. John Dorst, radiologists at the Johns Hopkins Hospital. Dr. Fletcher, radiologist at the Montreal Children's Hospital now brings to these pages increased emphasis on the important role of radiographic studies in both investigation and diagnosis.

A new setting, Montreal, has provided new opportunities to study respiratory problems in the fetus and newborn. The neonatal intensive care unit at the Montreal Children's Hospital under Dr. Leo Stern, the respiratory function laboratory under Dr. Pierre Beaudry, and the nurseries of the Royal Victoria Hospital under Dr. Robert Usher all provide clinical stimulation; the physiology department of McGill University, under Dr. David Bates, has been a superb setting in which to pursue animal studies, and the cooperation of Dr. Thurlbeck and Dr. Wang of the department of pathology has been invaluable. The research fellows since 1968, Drs. John Knelson, Robert Kotas, and H. William Taeusch, have been largely responsible for the studies from our laboratory, some of which have made it clear that the third edition is due.

I remain indebted to former fellows who contributed so much to the earlier editions, they are Drs. George Brumley, Sue Buckingham, Shirley Borkowf, Victor Chernick, Robert deLemos, Axel Fenner, W. Alan Hodson, Richard Nachman, Colin Normand, Hooshang Shaibani, and Jack Wolfsdorf.

Many of our colleagues have contributed helpful criticism and suggestions to this edition. Dr. Robert L. Williams extensively revised the chapter on perinatal circulation, and Dr. Ronald Shapera reviewed the section on infections. To them, and to all those who have participated in "newborn rounds" in recent years, this volume is our way of saying, "Thank you."

MARY ELLEN AVERY

# Preface to the First Edition

A monograph devoted to one organ at one time of life can be written only if innumerable investigators at the bedside and in the laboratory have directed their attention to the problem over many years. This work is a compilation of the experience in many parts of the world. It follows the publication of textbooks devoted to the newborn infant and his illnesses, upon which I have relied in great measure to provide the background and perspective needed to focus upon the lung. Three books in particular, Clement Smith's *Physiology of the Newborn Infant* (Thomas), William Silverman's *Dunham's Premature Infants* (Hoeber), and Alexander Schaffer's *Diseases of the Newborn* (Saunders), have provided much useful information about newborn infants. Potter's *Pathology of the Fetus and Infant* (Year Book) and Spencer's *Pathology of the Lung* (Macmillan) also furnished a wealth of information and references.

But interest in a subject and desire to assemble information about it could never have come from textbooks alone. Much came from opportunities for clinical and laboratory experience at the Johns Hopkins and Boston Lying-In Hospitals, and in the Department of Physiology, Harvard School of Public Health. But even more came from the stimulation of my teachers. I cannot possibly acknowledge everyone who has helped make this work possible. I cite for special mention Dr. George Anderson, who reminded me that the newborn infant has special and puzzling problems; Drs. Harry Gordon, Alexander Schaffer, and Janet Hardy, who by their stimulating rounds in the nurseries of The Johns Hopkins Hospital interested me in devoting special attention to newborn infants; Drs. Jere Mead, James Whittenberger, and Charles D. Cook at Harvard, who communicated much of their enthusiasm and knowledge about the physiology of the lung; and especially Dr. Clement Smith, whose own great interest in, and knowledge of, the newborn infant was shared through both his writings and his teaching to me as his research fellow for two years at the Boston Lying-In Hospital, and more recently in the preparation of

this work. I gratefully acknowledge the encouragement of my present chief, Dr. Robert Cooke, Professor of Pediatrics at Johns Hopkins, who has turned me loose in the newborn nurseries at Hopkins, and Drs. Richard Riley and Richard Shepard, who provide constant stimulation and advice on respiratory physiology. What is useful in this book is in large measure due to the observations and teachings of these people. What is missing or erroneous is in no measure their responsibility. I have tried to put together the pieces of a puzzle. Portions of a picture emerge. Probably some pieces are wrong, others are missing. If this work serves to stimulate others to help complete the picture, I shall be justly rewarded.

It is appropriate to acknowledge as well the changing status of medical investigation in this country. My predecessors for the most part accumulated their experience and wrote their works in the midst of the pressures of pediatric practice or large routine laboratory and teaching responsibilities. I have been relatively free to pursue investigations as they seemed appropriate, and to read at length, with only as many clinical and teaching responsibilities as were important to stimulate the investigative ones. This has been possible in large measure because of the generosity of the National Institutes of Health. A special traineeship provided support for the first three years after a pediatric residency, and subsequently research grants have made possible much of the work that is presented in this book. I am also indebted to The Maryland Heart Association and The American Thoracic Society for financial support, and to The John and Mary R. Markle Foundation for its great generosity in encouraging me to devote the largest portion of my time to teaching and research.

I am indebted to my many colleagues at The Johns Hopkins Hospital and elsewhere who endured endless questioning about some of the conditions discussed in these pages, and especially Dr. Alexander Schaffer, who reviewed the entire text. Dr. Olga Baghdassarian of the Department of Radiology not only collected most of the films, but wrote some of the descriptions of them, and wrote the section on "Roentgenographic Evaluation of the Chest."

The text could not have appeared in its present form without the assistance of Miss Carol Hoffman, who helped with the drawings and literature survey, Mrs. Joan Holthaus, who typed the manuscript, and Mrs. Dorothy Lyne, who assisted with the manuscript.

I wish to thank Dr. Robert R. Wright and Mr. Charles Stuart of The University of California Medical Center for their courtesy in allowing me to reproduce on the end sheets their beautiful photomicrographs of lung tissue which were originally published in *Science*, Vol. 137, August 24, 1962.

And finally I wish to acknowledge the great assistance and advice of the staff of W. B. Saunders Company.

MARY ELLEN AVERY



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PART  
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