SECOND EDITION

Premature Infants

DUNHAM

HOEBER
HARPER

Premature Infants . A MANUAL FOR PHYSICIANS

by Ethel C. Dunham, M.D.

FORMERLY ASSOCIATE CLINICAL PROFESSOR OF PEDIATRICS, YALE UNIVERSITY SCHOOL OF MEDICINE; DIRECTOR, DIVISION OF RESEARCH IN CHILD DEVELOPMENT, U. S. CHILDREN'S BUREAU; AND CONSULTANT IN PEDIATRICS, WORLD HEALTH ORGANIZATION, GENEVA, SWITZERLAND.

SECOND EDITION, COMPLETELY REVISED AND RESET

A HOEBER-HARPER BOOK

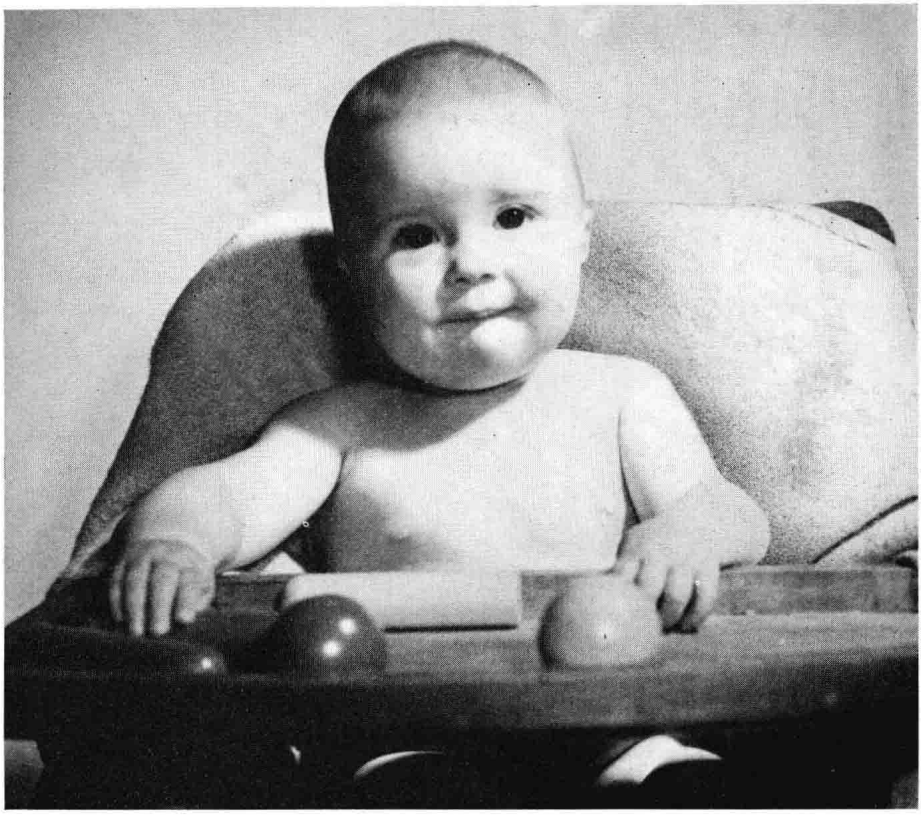
PREMATURE INFANTS: A MANUAL FOR PHYSICIANS

Second Edition

Printed in the United States of America

Library of Congress catalog card number: 55-9175

Premature Infants : A MANUAL FOR PHYSICIANS



A baby born about 2 months before term that, at 8 months of age, has overcome all the handicaps of prematurity. (Courtesy of Children's Bureau, Social Security Administration, Department of Health, Education, and Welfare, Washington, D. C.)

"In writing the book I have honestly tried to avoid the four grounds of human ignorance set forth so long ago by Roger Bacon: trust in inadequate authority, the force of custom, the opinion of the inexperienced crowd, and the hiding of one's own ignorance with the parading of a superficial wisdom."

—J. W. BALLANTYNE

PREFACE TO THE SECOND EDITION

Premature birth is now recognized as a world health problem and efforts to decrease the mortality rates from this important cause of neonatal death are being made on an ever-increasing scale. In addition newer knowledge is leading to a clearer understanding of the causes of premature labor which should result in lowering the incidence of premature birth.

In spite of a steadily increasing volume of research into these aspects of prematurity, premature birth continues to play the major role as a cause of neonatal death.

Some idea of the magnitude of the problem can be gained from recent findings for the United States on birth weights of live born infants. A sample survey indicated that, in 1950, about 7.4 per cent of live born infants, an estimated 270,000, weighed 2500 Gm. or less. The neonatal mortality rate was 173.7 per 1000 live births, a rate that was twenty-two times greater than that for infants who weighed more than 2500 Gm. In addition about two thirds of the infants who died during the first 4 weeks of life were premature on the basis of their birth weight.

It is obvious that, in spite of the efforts that have been made and are being made to reduce neonatal mortality from premature birth, there is need for greater efforts to improve premature infant care and to prevent premature termination of pregnancy.

This book has been prepared to serve as a source of information in regard to prematurity and as a guide for the general care of the premature infant.

Part I deals with general considerations—definitions of and criteria for prematurity; incidence, causes, and prevention of premature birth; and the growth and development of premature infants. Material from a wide variety of sources, with references for the convenience of those interested in more detailed study, has been brought together in compact form with a view to orienting the reader and providing a background for the clinical material.

Part II deals with the physiologic handicaps of premature infants; the general problems of their care; and the congenital and acquired conditions that tend to affect them adversely.

It is obvious that many problems of the medical and nursing care and the diagnosis and treatment of pathologic conditions of premature infants are similar to those of mature infants and of children in general. This book therefore attempts, in general, to deal only with conditions that are distinctly applicable to the premature infant in the first few weeks or months of life, or until the period is reached when the premature infant may be handled in the same way as the mature infant.

Part III outlines some of the public health aspects of prematurity including death rates and causes of death and cites examples of organized programs for care and for prevention of premature birth.

E.C.D.

Washington, D. C.

ACKNOWLEDGMENTS

This is the second edition of *Premature Infants: A Manual for Physicians.* The first edition appeared in 1948 under the same title as Publication Number 325 of the Children's Bureau. The author again expresses gratitude to those members of the professional staff of the Children's Bureau who assisted in the preparation of this manuscript and to all others who contributed with their advice or by permitting me to quote from their publications.

In the present edition, certain sections have been revised to bring them up to date, others have been rewritten, and new material has been added. The author is indebted to the authors and publishers referred to throughout the text for permission to use their publications in this way and to the physicians who have reviewed parts of the manuscript and who have assisted with their advice. I am particularly indebted to Doctors Harry H. Gordon, Katherine Dodd, Louis K. Diamond, Henry L. Barnett, John L. Parks, Edwards A. Park, and Harold C. Harrison, Eleanor Hunt, Ph.D., Miss Ruth Moore of the Children's Bureau, Miss Carnzu A. Clark and Mrs. Elizabeth E. Gardner. Special thanks are due to Mrs. Anna Kalet Smith for her painstaking work in checking the manuscript, to Mrs. Catharine L. Dominic for clerical assistance, and to Mrs. John C. Johnston, Jr., who assisted me in assembling the manuscript in final form. Miss Charlotte Kenton prepared the index.

CONTENTS

APPENDIX

Part One .
General Considerations

CHAPTER 1. *Definitions and Criteria of Prematurity*

DEFINITIONS

PREMATURITY

Prematurity needs to be clearly defined for three reasons: (1) for statistical purposes so that comparable data in regard to all aspects of premature infant births and deaths may be obtained; (2) for legal purposes, that is for the determination of legitimacy; and (3) for clinical purposes, in order to select infants needing special types of care and to evaluate methods for care and treatment in relation to the degree of prematurity.

In 1948, the World Health Assembly recommended the adoption by all countries, for purposes of vital statistics, of the following definition:

> For the purpose of this classification an immature infant is a liveborn infant with a birth weight of 5½ lbs. (2500 grams) or less, or specified as immature. In some countries, however, this criterion will not be applicable. If weight is not specified, a liveborn infant with a period of gestation of less than 37 weeks or specified as "premature" may be considered as the equivalent of an immature infant for purposes of this classification.[24]

This definition is now used in official national vital statistics for the United States of America.

RELATED TERMS

Statistics in regard to births and deaths of premature infants are useful in measuring the results of the care afforded these infants and their progress from year to year. In order that accurate vital statistics may be obtained within individual countries and that these may be compared with those of other countries uniformity of reporting and the use of comparable definitions of certain terms are prerequisites.

The following definitions have been recommended for international use by the World Health Organization:

Live Birth

Live birth is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered live born.[25]

There now exist wide variations in different countries as regards the sign or signs of life which can be considered as "evidence of life."

Fetal Death

Fetal death is death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy; the death is indicated by the fact that after such separation, the foetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles.[25]

There is still little agreement among countries on the definition of the terms "stillbirth" and "abortion." By accepting the above definition of fetal death and by reporting fetal death and month of gestation at the time of its occurrence, international uniformity may be more easily obtained than by attempting conformity in definitions of the older terms (stillbirth and abortion).

Neonatal Period

The term "neonate" means literally newborn; the term neonatal period is usually used to include the first month or weeks (28 days). No recommendations have been officially made for international usage on the exact period of time to be included, however. Pascua has pointed out that data on neonatal mortality are available for some countries, but that the rates are, in some instances, not comparable due to differences in live birth reporting and to the definition of "neonatal" period. In some medical reports the period has been referred to as the first 10 or 14 days (see Appendix I).

CRITERIA OF PREMATURITY

The diagnosis of prematurity is sometimes based on the physician's interpretation of certain clinical signs. This interpretation reflects the indi-