Handbook of Pediatric Emergencies

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Charts and graphs by **Beth Crescent**

Little, Brown and Company
Boston/Toronto/London

First Edition

Library of Congress Catalog Card No. 89-83471

ISBN 0-316-07919-7

Printed in the United States of America

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Preface

Few aspects of medicine are as demanding of one's time and energy as the care of acutely ill and injured children. The purpose of this book is to save time for physicians by providing a pocket-sized practical guide to the diagnosis and treatment of pediatric emergencies. Although designed for students and emergency and pediatric house staff, I believe that emergency physicians, pediatricians, and family physicians will also find it useful.

Over 40 chapters are included, each containing a brief review of diagnosis, treatment, and patient disposition, with a list of key points to reinforce important information. I have tried to create a functional format, with chapters and sections organized by presenting sign or symptom rather than by diagnosis. Supplementing the text are illustrations showing over 20 procedures and an informative formulary of emergency medications for neonates and children.

For conciseness, discussion of pathophysiology and controversial aspects of diagnosis and therapy have been minimized. In most cases, therapeutic regimens are based on data from the literature, but when this was lacking, tried and true protocols currently used by the various departments of medicine and surgery at Children's Hospital in Vancouver have been substituted. The reader is advised that differing therapies are often acceptable—the danger of strictly adhering to protocols in all emergency treatment situations cannot be overstated. Those wishing more information on a particular subject are encouraged to consult the bibliographies at the end of the chapters or any authoritative text in the field.

Production of this volume was a truly cooperative effort, and could not have been accomplished without the intellectual, emotional, and moral support of the following persons: Dr. Gary Fleisher, one of the great leaders in the field, for his review of material that pertains to the American readership; Dr. Volker Ebelt, for his painstaking review from the standpoint of the generalist pediatrician; Dr. David Scheifele, for his review of areas pertaining to infectious disease; Dr. David Steward, for his review of the resuscitation section; Dr. Charles Snelling, for his review of the chapters on burns and smoke inhalation and on frostbite; Gillian Willis, M.P.S., for her review of the toxicology chapter; Susan Pioli, Senior Editor, and Jon Sarner, Production Editor, at Little, Brown and Company, for their enthusiasm and patience in guiding this project; and the patients, parents, and medical, nursing, and other staff of B.C.'s Children's Hospital, who provided the inspiration.

G.A.B.

Contents

I

Resuscitation

Notice

The indications and dosages of all drugs in this book have been recommended in the medical literature and conform to the practices of the general medical community. The medications described do not necessarily have specific approval by the Food and Drug Administration for use in the diseases and dosages for which they are recommended. The package insert for each drug should be consulted for use and dosage as approved by the FDA. Because standards for usage change, it is advisable to keep abreast of revised recommendations, particularly those concerning new drugs.

1

Respiratory Failure

Derek Blackstock

Respiratory failure occurs when there is inadequate delivery of oxygen to or removal of carbon dioxide from the pulmonary circulation. Ensuring adequate ventilation is the first priority in the management of the ill child.

I. Diagnosis. Respiratory failure may be due to upper or lower airway obstruction, restrictive lung disease, or inefficient gas transfer (Table 1-1). Common causes are infections (croup, epiglottitis, pneumonia), asthma, chest trauma, and depression of the respiratory center secondary to head injury, meningitis, or toxic ingestion. An awareness of the factors that can interact to cause respiratory failure is vital to early diagnosis and treatment (Fig. 1-1).

The **definitive diagnosis** is made by arterial blood gas analysis (see Table 1-2). Alternative but less accurate diagnostic methods are capillary and transcutaneous blood gas measurements. Pulse oximetry and end-tidal carbon dioxide monitoring are excellent for continuous monitoring of respiratory status. The **clinical manifestations** of respiratory failure in the child include: (1) **respiratory dysfunction** with cyanosis, chest retraction, grunting, tachypnea, and apnea; (2) **cerebral dysfunction** causing agitation, restlessness, headache, convul , and coma; and (3) **cardiovascular dysfunction** in ng dysrhythmia and cardiac arrest.

II. Assessment and management (Fig. 1-2)

A. Initial assessment. If the patient is conscious and responding appropriately with adequate respiratory and cardiac function, these signs usually indicate sufficient oxygenation. Initial assessment is the same in all cases:

1. Look for respiratory effort.
2. Listen for air entry at the chest or over the trachea.
3. Feel for air exchange at the mouth, nose, or artificial airway.

Further evaluation of the airway is essential to detect subtle degrees of obstruction. Following the initial respiratory assessment, determine cardiovascular function—auscultate the heartbeat and assess capillary filling, pulses, and blood pressure.

B. Opening the airway

1. **Head tilt and jaw lift** (Fig. 1-3). Extend the cervical spine and atlantoaxial joint and lift the bony portion of the chin forward, placing the child in the "sniffing position." This is often sufficient to improve respiration in the unconscious child. Avoid hyperextension because airway obstruction may result. When cervical injury is suspected, have an assistant stabilize the head in the neutral position with cranial traction while performing the jaw thrust.
2. **Jaw thrust** (Fig. 1-4). Because children have a relatively large tongue, the jaw lift may force the tongue against the posterior pharyngeal wall, caus-