SIGNS, SYMPTOMS and TREATMENT of CERTAIN ACUTE INTOXICATIONS

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SECOND EDITION

(Second Edition)

SIGNS, SYMPTOMS and TREATMENT of CERTAIN ACUTE INTOXICATIONS

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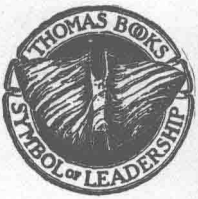

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Dedicated to

DR. HOMER F. MARSH

FOREWORD TO SECOND EDITION

The reception of the First Edition of this handbook, "Signs, Symptoms and Treatment of Certain Acute Intoxicants," has been more than gratifying. With the exhaustion of the second printing of the First Edition, it appeared necessary to have either a third printing of the original text or, what seemed more desirable because of the development of many new insecticides and industrial poisons, to revise the original text and bring it up to date. In addition, the national interest in control of poisons and the treatment of acute poisoning has been emphasized by the establishment of poison control centers over the entire country. The original use of this handbook, designed primarily for interns and residents in the Emergency Department of the Jackson Memorial Hospital, Miami, Florida, has therefore found a wider utilization both in this country and abroad.

In this Second Edition, more than 400 new entries have been added without making the text too unwieldy for a pocket reference. In addition, a numerical and alphabetical system of indexing will expedite the use of the text in emergency conditions. References to the literature will permit additional study of individual topics when desired.

Dr. Deichmann is to be complimented on obtaining the cooperation of Dr. Horace W. Gerarde, Head Toxicologist of the Esso Research & Engineering Co., Linden, New Jersey.

As Chairman of the Pharmacy Committee of the Jackson Memorial Hospital Staff, I acknowledge the indebtedness of the Staff of this Hospital to Drs. Deichmann and Gerarde for the extensive labor required in the preparation of this handbook. It will prove useful to interns, residents, physicians, poison control centers, pharmacists, First Aid stations, and laymen interested in the prevention and treatment of acute intoxications.

M. Jay Flipse, M.D.
Chairman, Pharmacy Committee
Jackson Memorial Hospital

Miami, Florida

FOREWORD TO FIRST EDITION

This condensed synopsis on poisons was designed for the use of Interns and Residents on emergency service at the Jackson Memorial Hospital, Miami, Florida. In 1954, the Pharmacy Committee of the Staff of the Jackson Memorial Hospital revised the Formulary for the Hospital. It was anticipated that information regarding poisons should be included in the Formulary. The Pharmacy Committee requested Dr. Wm. B. Deichmann, Professor of Pharmacology, Medical School, University of Miami, and an advisory member of the Committee, to prepare the data on poisons. It soon became evident that many new toxic substances which had been developed during the last ten years as insecticides, together with other toxic compounds used in industry or as drugs, would have to be included. Dr. Deichmann has therefore prepared a brief summary of the common poisons and has arranged the material for quick reference.

It is anticipated that this new material will prove particularly useful to the House Staff of the Hospital during their service in the Emergency Facility. In addition this little volume should be most useful to the general practitioner who will find in it a ready source of information regarding the nature of many insecticides marketed under a trade name.

As Chairman of the Pharmacy Committee, I wish to acknowledge our indebtedness to Dr. Deichmann for the many hours of research required in the preparation of this useful volume.

M. Jay Flipse, M.D.
Chairman Pharmacy Committee
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Miami, Florida

PREFACE TO SECOND EDITION

The enthusiastic reception of the First Edition and the realization that publications in this dynamic field have a very short "half-time" promoted preparation of this Second Edition.

The book retains the "handy" size and format of the First Edition. The number of chemicals has been increased, new sections have been added, and others expanded. A brief section on First Aid advice which physicians can give on the telephone to frantic individuals reporting a case of acute intoxication has been added. Also included is a section on Artificial Respiration for adults, infants, and young children.

Chemicals are again arranged alphabetically and numerically for simplicity and rapidity in finding them. The book is not intended to be a pharmacology text or encyclopedic in its coverage. Emphasis is placed on brevity and accuracy, and as in the First Edition, no attempt is made to list well-known chemicals, but to include instead those compounds which have been described in the most recent literature in medicine, pharmacology and toxicology. Original literature sources are given for the reader who desires more complete information.

No attempt is made to list the comparisons of commercial products which have been compiled in a monumental work recently published by M. N. Gleason, R. E. Gosselin, and H. C. Hodge, *Clinical Toxicology of Commercial Products,* The Williams & Wilkins Co., 1957.

It is a pleasure to acknowledge the many helpful suggestions of Dr. M. Jay Flipse, Chairman of the Pharmacy Committee, Jackson Memorial Hospital, Miami, Florida, who, at no hour of the solar day, considered it too early or too late to discuss some subject offering room for controversy or debate. It is an equal pleasure to recognize the suggestions of Dr. W. Alan Wright, Medical Director of Chas. Pfizer & Co., Inc., as well as the contributions of our colleagues at the University of Miami who reviewed or edited the following:

Air and Circulation—Dr. Robert S. Litwak, Assistant Professor of General Surgery.

Antibiotics—Dr. Jack L. Radomsky, Associate Professor of Pharmacology.

Cardiac Drugs—Dr. George F. Schmitt, Clinical Assistant Professor of Pharmacology.

Coral Poisoning and Jellyfish—Dr. Charles E. Lane, Associate Professor of Marine Sciences.

Drugs and Dosages, Etc.—Dr. Winston K. Shorey, Associate Professor of Medicine and Associate Dean, School of Medicine.

Poison Ivy—Dr. Harvey Blank, Professor of Dermatology in Medicine.

Radiation—Dr. Harold E. Davis, Clinical Professor of Radiology in Surgery.

Removal from Alimentary Tract and Snake Venom—Dr. John J. Farrell, Professor of Surgery and Chairman of Department.

Acute Eye Injury—Dr. Kenneth S. Whitmer, Clinical Associate Professor of Ophthalmology in Surgery.

Symptomatic Treatment and Tetanus—Dr. M. Jay Flipse, Clinical Assistant Professor in Medicine.

Transportation to Hospital—Dr. Oliver A. Smith, Instructor in Preventive Medicine and Director, Out-Patient Services, Jackson Memorial Hospital.

It is our sincere hope that this booklet will be found helpful in the diagnosis and in the treatment of certain acute intoxications. Indeed, we invite suggestions or criticisms that will help to make the Third Edition an even better volume.

Wm. B. Deichmann
H. W. Gerarde

PREFACE TO FIRST EDITION

This small volume lists signs and symptoms of certain acute intoxications and makes recommendations for treatment. No attempt was made to include all reasonably well known compounds. Emphasis was placed upon methods of treatment which have appeared in the more recently published medical literature. The commercial names for a number of household poisons have been included since they will, at times, furnish the only clue to the nature of the material that caused the intoxication. Only in exceptional instances is reference made to chronic intoxications. For more complete information the reader is referred to textbooks in Pharmacology such as *Pharmacology in Medicine* edited by Victor A. Drill (McGraw-Hill Book Co., Inc., New York; 1954), *The Pharmacological Basis of Therapeutics* by Louis S. Goodman and Alfred Gilman (The Macmillan Co., New York; 1955), *A Manual of Pharmacology* by Torald Sollmann (W. B. Saunders Co., Philadelphia; 1948), or to *Poisoning, A Guide to Clinical Diagnosis and Treatment* by W. F. von Oettingen (P. B. Hoeber, Inc., Medical Book Department of Harpers & Bros.; 1952).

It is a pleasure to acknowledge constructive criticisms and comments of my friends and colleagues at this School of Medicine who went over various portions of the manuscript. These include: Dr. John J. Farrell, Professor of Surgery, Dr. Robert Lawson, Professor of Pediatrics, Dr. Franz Stewart, Professor of Medicine *pro tem*, Dr. Robert Boucek, Clinical Associate in Medicine, Dr. George Schmitt, Assistant Clinical Professor of Pharmacology, Dr. Willard Machle, Associate Professor of Pharmacology, and Dr. Oliver A. Smith, Director of the Outpatient Services, Jackson Memorial Hospital, Miami, Florida. I am particularly indebted and grateful to Dr. M. Jay Flipse, Chairman of the Pharmacy Committee of the Jackson Memorial Hospital for his sound advice and valuable suggestions, and to Dr. Horace W. Gerarde, Head Toxicologist at Esso Research and Engineering Company, Linden, N. J., for his helpful ideas and aid in proof-reading.

WM. B. DEICHMANN

Coral Gables, Florida

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Part 1

FIRST AID

The advice a physician gives on the telephone to frantic individuals reporting a case of acute poisoning may be life-saving or prevent permanent serious injury. First aid instructions must be brief, explicit, and practical, and depend on the condition of the patient at that moment, the nature of the chemical and whether it was ingested, inhaled, spilled on the skin, into the eyes, or injected. Give the following advice:

1. If the patient is gasping for breath or if breathing has stopped, start artificial respiration at once and have someone call the Police Department, Fire Department or Rescue Squad for a resuscitator.

2. If the patient is unconscious, in shock, deeply cyanotic or in convulsions bring him to the hospital at once.

3. If the patient is conscious and has ingested a toxic substance, make him drink all the tap water, salt water, or milk that he can hold and induce vomiting. If it is definitely known that he has swallowed strong alkali (Lye, Drano, Ammonia), strong acids or petroleum solvents *do not* induce vomiting, but take him immediately to the hospital.

4. After filling the stomach with liquid, induce vomiting by putting a finger or a spoon into the patient's mouth and touching the back of the throat. If the patient is a child, do this while holding him on the lap in the "spanking position" with his head held lower than the trunk and hips.

5. Collect the vomitus in a dish-pan, pail or other suitable container. Fill the stomach with fluids again and induce vomiting several times.

6. Save the label and the container from which the poison was swallowed.

7. Take the patient, regurgitated material and container to the hospital.

8. For skin contamination drench affected parts with water (hose, tub, or shower) and remove clothing.

9. For eye contamination wash eyes for 15 minutes with running water.

Artificial Respiration

I. For Adults

If the patient is not breathing, your hands may save his life if you act quickly. Do this:

1. Lay him face down, with his hands under his face (Figure 1).
2. Check to see that air can enter the lungs through the mouth by removing false teeth, gum, or tobacco from the mouth. Pull the tongue forward.
3. Kneel at the patient's head, place your hands on his shoulder blades (Figure 1).
4. Swing forward slowly, with elbows straight, until your shoulders are over the heels of your hands (Figure 2).
5. Rock back, lifting the patient's elbows (Figure 3) and return to the sitting position (Figure 4).

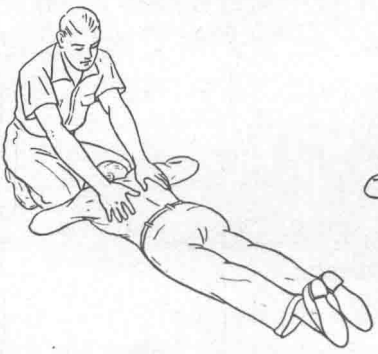

Fig. 1

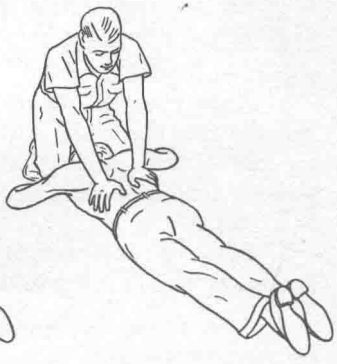

Fig. 2

Fig. 3

Fig. 4

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6. Release his arms and repeat the movements 12 times each minute until the victim revives or a doctor tells you to stop.

7. Artificial respiration should never be stopped as long as a pulse or heart beat can be felt. Recovery of normal breathing may be delayed a long time. Most patients recover within 30 to 45 minutes. Some have been resuscitated after several hours of artificial respiration. If a person has not been breathing for 5 to 10 minutes, the chance of survival is slight even with the best inhalators or resuscitators.

II. For Infants and Young Children

1. Clear the mouth of foreign matter with middle finger of one hand, and at the same time hold the tongue bringing it forward (Figure 5).

2. Place child in position shown in Figure 6, and pat him firmly on the back with free hand.

3. Place child on his back. Using middle fingers of both hands lift lower jaw so that it juts out and hold as shown in Figure 7.

4. Place your mouth over child's mouth and nose and breathe into the child with a steady, smooth action until the chest rises. Meanwhile, with free hand apply continuous moderate pressure to child's abdomen as shown in Figure 8.

5. Remove your mouth from child's mouth and nose and allow child's lungs to empty.

Fig. 5

Fig. 6

Fig. 7

Fig. 8

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6. Repeat this process 20 times per minute.

7. This method may also be used for older children and adults, with slight modification in technique. Keep both hands under jaw to hold it in forward position and place mouth over victim's mouth while clamping the nostrils with the two thumbs. Breath should be blown in at 12 cycles per minute.

Tracheotomy

This is a life-saving procedure which can be performed quickly with scalpel, razor blade or sharp knife in cases of mechanical obstruction or laryngeal edema. The chin is pulled back to tighten the skin over the larynx and trachea. After locating the cricoid cartilage, a midline incision is made from the cricoid to the sternal notch. The two upper tracheal rings are divided in the midline. The rings are parted and a tracheotomy tube is inserted.

When tracheotomy tube is not available, turn the knife cross-wise to keep trachea open until tube can be obtained.

GENERAL SUGGESTIONS FOR TREATMENT

Transportation to Hospital

Proper transportation of a patient may be life-saving. It is important to have him in a position which maintains an open air-way and prevents aspiration of vomitus. Place him in the prone position keeping the head lower than the hips. False teeth should be removed and the tongue pulled forward to establish free respiratory exchange. In an exceptional instance, tracheotomy may be in order. The physician's primary purpose is to keep the patient alive, hence the fewer the heroic procedures that are employed, the better it is for the patient. A patient should receive no treatment or drug unless it is given for a well-recognized reason.

Shock

Shock is recognized by a generalized depression of all vital body activities such as: low blood pressure, subnormal body temperature, weak and rapid pulse, ashen pallor, irregular breathing and dulling of the sensibilities. Keep patient warm and in a recumbent position with head low to promote blood flow to the brain and heart. If patient is conscious, coffee or tea may be administered.

Coma

A patient entering the hospital in coma presents a special problem, but through an orderly approach it is generally possible to determine the cause. This may be one of the following, as modified from M. J. Parsonage (*Brit. Med. J.*: Jan. 22, p. 217, 1955).

(a) Cerebrospinal injuries and conditions causing cerebral ischemia including hemorrhage, thrombosis, embolism, hypertensive encephalopathy and terminal congestive heart failure.
(b) Intracranial infections and tumors such as meningitis, encephalitis, intracranial abscesses and neoplasms.
(c) Psychic disorders (stupor in hysterical, schizophrenic and depressive illnesses).
(d) Physical agents such as heat hyperpyrexia, electric shock and caisson disease.
(e) Diabetic coma (and insulin shock).
(f) Exogenous poisons.

Exposure by Inhalation

If absorption occurred by inhalation, remove promptly from the site of exposure. A word of caution is in order. Toxic gases exhaled by a patient, if permitted to be inhaled by medical personnel, may induce signs of severe intoxication. This occurred in doctors and nurses attending victims of the Cleveland Clinic disaster who were exposed to Oxides of Nitrogen originating from burning x-ray film.

Skin Exposure

In general, materials spilled on the skin are removed by thorough washing with soap and plenty of water. DO NOT waste time looking for solutions in which the chemical may be more soluble. If a considerable portion of the body has been exposed, remove all clothing under the shower and flush with a *vertical flood of water.*

Removal from Alimentary Tract

Following ingestion, in the absence of respiratory or circulatory failure, the rapid removal of the material from the stomach constitutes the dominating factor in the immediate treatment. This may be effected by emesis induced by touching the soft palate with a finger, or by drinking warm salt water (2% to 3% NaCl). (Ingestion of Copper Sulfate, Tartar emetic or Ipecacuanha is *not* recommended.)

If a corrosive compound (alkalis, strong acids) or petroleum solvents have been ingested, do not induce vomiting. For alkali, give vinegar or lemon juice and for acid use milk, cream or vegetable oil. A vegetable oil should not be used after ingestion of a halogenated hydrocarbon since the oil will favor absorption of these materials. Administration of Apomorphine is *not* recommended. "When a corrosive agent of any sort has been swallowed, it is imperative, early in the course of treatment, to have the patient swallow a weighted string, the proximal end of which is subsequently taped to the side of the face. This is important for the later treatment by dilatation when stricture formation ensues. If one delays too long, edema of the esophagus will make swallowing of the string impossible" (John J. Farrell, U. of Miami).

Gastric lavage should be considered even after considerable time has elapsed after ingestion. Warm tap water is as effective as any other material. To be thorough, two gallons should be employed in portions of about 300 to 400 ml. each. To this lavage water may be added enough of the "Universal Antidote" to obtain a