FOURTH EDITION

POISONING IN CHILDREN

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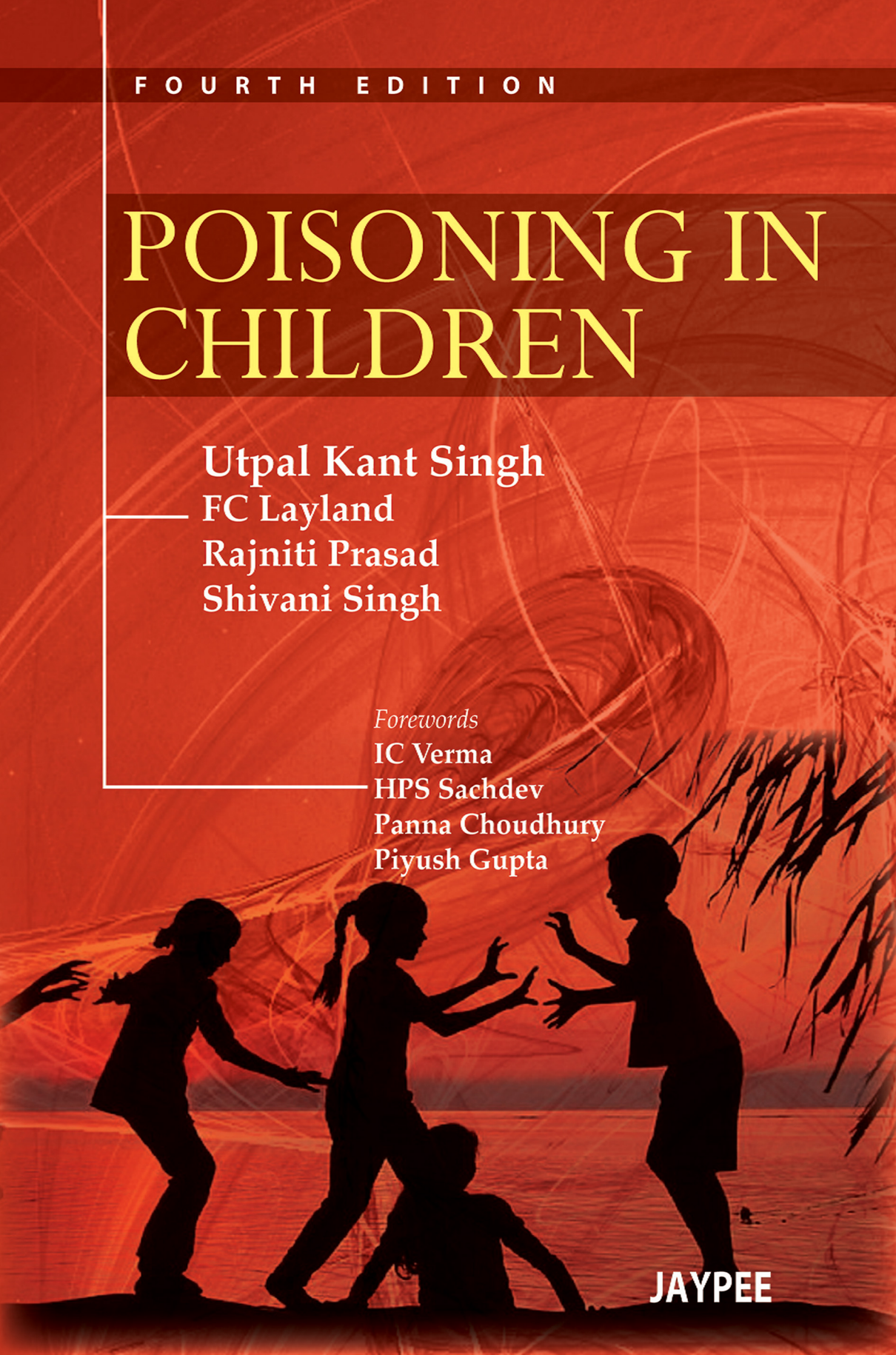

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CHAPTER

2 General Symptoms and Signs of Poisoning

Chapter Outline

- General Signs and Symptoms of Poisoning
  - Poison: Signs and Symptoms
  - Nervous System
  - Cardiovascular Symptoms
  - Gastrointestinal Tract
  - Respiratory Symptoms

While supportive therapy is being initiated to maintain physiologic homeostasis, efforts must be made to ascertain the type and mode of intoxication, the quantity of toxin involved and the time lapsed since exposure. Since the history is often unreliable and inadequate, physical examination assumes greater importance. The physician should pay close attention to and look for various signs and symptoms based on which one may unravel the identity of the underlying poison.

Physical examination should initially focus on the vital signs, cardiopulmonary and neurologic status to ascertain the need for immediate supportive management. The effect of a poison on the level of consciousness is variable. The patient may be comatosed or may come in an irritable, restless state. Table 2.1 lists a differential diagnosis on the basis of central nervous system (CNS) activity and vital signs as affected by particular poisons.

After initial assessment of vital signs, consciousness level and behavior quick general survey and neurological examination is done. In the general survey of the patient, the face may show grimacing (phenothiazines, butyrophenones), pallor (hemolysis), cyanosis (hypoxia or methemoglobinemia) or icterus (drug induced hepatic injury or hemolysis). Acidotic breathing may indicate increased anion gap metabolic acidosis (methanol, salicylates) or due to lactic acidosis (any poison causing hypoxia, hypotension or seizure). The pulse may reveal an abnormal rate or rhythm. Tachycardia and tachyarrhythmia (sympathomimetics, anticholinergics) or bradycardia or bradyarrhythmias (digitalis, cholinergic agents). Skin may reveal needle marks, abscesses (opiates, amphetamines, and cocaine), staining (chronic exposure to chloride, bromide or similar chemicals) blisters on extensor surfaces or back (abuse of CNS depressants) or flushing (due to belladona derivatives, anthistaminics, phenothiazines or tricyclic antidepressants). Alopecia may be found due to arsenic or thallium.

In the systemic examination, examination of oral cavity may unveil signs of caustic ingestion. Presence or absence of gag reflex, amount of salivation,

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Table 2.1: Differential diagnosis on the basis of CNS

A. Stimulant poisoning	*B. Depressant poisoning*
1. Sympathomimetic effects (restlessness, sweating tachycardia, dilated pupils, flushing, plucking of hair) Amphetamine Caffeine Cocaine Decongestants MAO inhibitors Theophylline	1. Sympatholytic effects (Bradycardia, hypotension, wheezing due to bronchoconstriction, sedation, depression, hallucination) Adrenergic blockers Antiarrhythmics Tricyclic antidepressants Antihypertensives Calcium channel blockers Digoxin
2. Anticholinergic effects (Tachycardia, warm dry flushed skin, hyperthermia, dilated pupils, decreased bowel sounds and urinary retention). Dhatura and other belladona alkaloids, tricyclic antidepressant, antihistaminics, antiparkinsonian agents, antipsycotics, antispasmodics, mydriatics, mushrooms	2. Cholinergic effects: (nausea, vomiting, abdominal cramps, diarrhea, involuntary defecation and micturition, sweating, salivation, lacrimation, bronchorrhea, blurred vision due to miosis weakness) organophosphorus, carbamate, pyridostigmine
3. Hallucinogenic effects: LSD and synthetic analogues, Marijuana. Mescaline and synthetic analogues, phencyclidine	3. Narcotism Analgesics Antispasmodics
4. Withdrawal syndrome Alcohol Antidepressants Beta-blockers Narcotics Sedative hypnotics	4. Sedative hypnotic effects Alcohol Antiepileptics Barbiturates Benzodiazepines Hydrocarbons Glutethimides

presence of foul odor of breath can be found out which gives clues for the type of poison involved. Abdominal examination reveals either hyperperistalsis (cholinergics) or agony (opiates, anticholinergics and barbiturates).

The chest may show features of pulmonary edema (carbon monoxide, cyanide, narcotics, salicylates) or aspiration pneumonia (hydrocarbons and CNS depression or patient in coma/seizures) or bronchospasm (cholinergics, beta-blockers and opiates).

Cardiac examination may reveal underlying cardiomyopathy (alcohol, heavy metals) or endocarditis (opiates, amphetamines) and also confirm the tachyarrhythmias or bradyarrhythmias found in general survey.

Evaluation of the nervous system and the eyes, comprise of a very important part of the examination. The level of consciousness must be assessed repeatedly. It is important to remember that impaired neurological

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functions may be caused by direct toxic effect or indirect effect of electrolyte imbalance or oxygen deprivation). Cerebellar dysfunction and hyperesthesia may be due to intoxication with heavy metals or with carbon monoxide. Muscle fasciculations, myoclonic jerks, and seizures are common, in a large number of cerebral intoxicants. Presence of spaticity (anticholinergics, strychnine and botulinism) should not be overlooked.

Ophthalmological survey may reveal impaired vision (methanol, mercury) blurred vision (cholinergics and anticholinergics) yellow vision (digitals). Papillary examination (size and reaction to light) is very important as mydriasis (anticholinergics, sympathomimetics) or miosis (cholinergics, opiates and sympatholytics) is an important clue.

Specific signs and symptoms due to poisons involved are given in the table below:

General Signs and Symptoms of Poisoning

Poison : Signs and Symptoms

1.	Miosis	Cholinesterase inhibitors, barbiturates, nicotine, opium, morphine, parasympathomimetics
2.	Mydriasis	Cocaine, dhatura, thallium, cyanide, carbon monoxide, benzene, sympathomimetics
3.	Partial or total blindness	Methyl alcohol
4.	Blurring of vision	Cholinesterase inhibitors, dhatura, alcohol, ergot
5.	Purple-yellow vision	Digitalis

Face and Scalp

1.	Alopecia	Thallium, arsenic, ergot, lead
2.	Facial twitching	Lead, mercury, phenothiazines
3.	Dull and mask like expression	Thallium, bromides, barbiturates

Skin and Mucous Membrane

1.	Pallor	Aniline derivatives, sympathomimetics, insulin, pilocarpine
2.	Cyanosis	Carbon monoxide, morphine, sulphonamide and drugs causing methaemoglobinemia
3.	Ashy coloration	Ergot, lead
4.	Yellow	Chlorinated compounds, arsenic other heavy metals, mushrooms
5.	Sweating	Physostigmine, cholinesterase inhibitors, nicotine, pilocarpine
6.	Dry, hot skin	Dhatura and its allied alkaloids, botulinum toxin
7.	Brown-black	Iodine

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8.	Deep brown	Bromide
9.	Gray	Mercuric chloride
10.	White	Phenol derivatives

Gastrointestinal Tract

Nausea, vomiting, diarrhea, dehydration, abdominal pain; corrosive acids and alkalis, heavy metals, nicotine, ergot, phosphorus, phenol, cresol, mushroom, digitalis, cantharides, morphine, cholinesterase inhibitors, cocaine and salicylates.

Nervous System

1.	Headache	Carbon monoxide, phenol, lead, benzene and its derivatives, cadmium, strychnine, copper salts atropine, scorpion sting and bites of black widow spider.
2.	Convulsions	Carbon monoxide, sodium fluoroacetate, mushrooms, cyanides, salicylates, copper salts, nicotine, lead, cholinesterase inhibitors, dhatura cocaine and strychnine.
3.	Delirium	Dhatura, cocaine, lead, arsenic, ergot, barbiturates, DDT, physostigmine.
4.	Coma	Salicylates, mushrooms, cholinesterase inhibitors, insulin, phenol, carbon monoxide, cyanide, lead, barbiturates, morphine derivatives and analogues, nicotine.

Respiratory Symptoms

1.	Tachypnea, cough, hoarseness stridor, dyspnea, retractions wheezing, chest pain, sooty sputum	Nicotine
2.	Pulmonary edema	Carbon monoxide, cyanide, narcotics, salicylate

Cardiovascular Symptoms

1.	Bradycardia, AV bock	Beta blockers, antiarrhythmics, Ca^{++} channel blockers, carbamates and organophosphorus, digitalis, tricyclic antidepressants
2.	Ventricular tachyarrhythmias	Antipsychotic, tricyclic antidepressants fluorides, heavy metals, lithium, magnesium
3.	Cardiomyopathy	Alcohol, heavy metals(selenium)
4.	Endocarditis	Opiates, amphetamines

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POISONING IN CHILDREN

Salient Features

- Gives practical guidelines on diagnosis and management of acute intoxications in children
- Formats in actual clinical emergency approach
- Includes new chapters on Mushroom, Celphos, *Jatropha*, Podophyllin, Dapsone and Baclofen
- Consists of revised matter on scorpion sting envenomation, snake bite, organophosphorus, hydrocarbon, lead, and arsenic.

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Medical Publishers (P) Ltd.
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ISBN 978-93-5025-773-9