

**PEDIATRIC
DRUG DOSES**

Jaypee Brothers

PEDIATRIC DRUG DOSES

THIRD EDITION

GL Chattri MBBS MD MHA

Consultant Pediatrician and Neonatologist

Mahakoshal Hospital

Seth Mannulal Jagannathdas Trust Hospital and
Research Centre

and

Metro Hospital

Jabalpur, Madhya Pradesh, India

Foreword

Avyakt Agarwal



The Health Sciences Publisher

New Delhi | London | Philadelphia | Panama



Jaypee Brothers Medical Publishers (P) Ltd

Headquarters

Jaypee Brothers Medical Publishers (P) Ltd
4838/24, Ansari Road, Daryaganj
New Delhi 110 002, India
Phone: +91-11-43574357
Fax: +91-11-43574314
Email: jaypee@jaypeebrothers.com

Overseas Offices

J.P. Medical Ltd
83 Victoria Street, London
SW1H 0HW (UK)
Phone: +44 20 3170 8910
Fax: +44 (0)20 3008 6180
Email: info@jpmedpub.com

Jaypee-Highlights Medical Publishers Inc
City of Knowledge, Bld. 237, Clayton
Panama City, Panama
Phone: +1 507-301-0496
Fax: +1 507-301-0499
Email: cservice@jphmedical.com

Jaypee Medical Inc
325 Chestnut Street
Suite 412, Philadelphia, PA 19106, USA
Phone: +1 267-519-9789
Email: jpmed.us@gmail.com

Jaypee Brothers Medical Publishers (P) Ltd
17/1-B Babar Road, Block-B, Shaymali
Mohammadpur, Dhaka-1207
Bangladesh
Mobile: +08801912003485
Email: jaypeedhaka@gmail.com

Jaypee Brothers Medical Publishers (P) Ltd
Bhotahity, Kathmandu, Nepal
Phone +977-9741283608
Email: kathmandu@jaypeebrothers.com

Website: www.jaypeebrothers.com
Website: www.jaypeedigital.com

© 2016, Jaypee Brothers Medical Publishers

The views and opinions expressed in this book are solely those of the original contributor(s)/author(s) and do not necessarily represent those of editor(s) of the book.

All rights reserved. No part of this publication may be reproduced, stored or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission in writing of the publishers.

All brand names and product names used in this book are trade names, service marks, trademarks or registered trademarks of their respective owners. The publisher is not associated with any product or vendor mentioned in this book.

Medical knowledge and practice change constantly. This book is designed to provide accurate, authoritative information about the subject matter in question. However, readers are advised to check the most current information available on procedures included and check information from the manufacturer of each product to be administered, to verify the recommended dose, formula, method and duration of administration, adverse effects and contraindications. It is the responsibility of the practitioner to take all appropriate safety precautions. Neither the publisher nor the author(s)/editor(s) assume any liability for any injury and/or damage to persons or property arising from or related to use of material in this book.

This book is sold on the understanding that the publisher is not engaged in providing professional medical services. If such advice or services are required, the services of a competent medical professional should be sought.

Every effort has been made where necessary to contact holders of copyright to obtain permission to reproduce copyright material. If any have been inadvertently overlooked, the publisher will be pleased to make the necessary arrangements at the first opportunity.

Inquiries for bulk sales may be solicited at: jaypee@jaypeebrothers.com

Pediatric Drug Doses

First Edition: 2010

Second Edition: 2012

Third Edition: 2016

ISBN 978-93-5250-137-3

Printed at

Dedicated to

*Late (Professor) Dr Rajpoot VJ Sir (Indore),
who taught me the art of pediatrics*

Jaypee Brothers

Foreword

One of the areas of deficiency is the lack of easily available information on pediatric drug dosing for frontline caregivers. Ideally, all persons involved in the treatment of critically ill infants and children should have the basic knowledge about pediatric drug dosing along with the basic clinical skills. This handbook is a good attempt to do just that. It is a concise and useful guide on all the aspects of care related to pediatric drug dosing.

The information and lessons presented in this book will help those who care for the critically ill child; if studied and kept close at hand, it would bolster their confidence and lessen their anxiety related to drug information (indications, doses, brand names, etc.).

This book is a welcome addition to the pediatric literature. It is a reasonable compromise between voluminous and complex textbooks.

Avyakt Agarwal MD

Assistant Professor

Department of Pediatrics

Netaji Subhash Chandra Bose Medical College

Jabalpur, Madhya Pradesh, India

Preface to the Third Edition

Welcome to this edition of the *Pediatric Drug Doses*. Tradition of this publication began in 2010. I am very thankful to all who accepted and appreciated its previous editions. I have tried to retain the format of previous edition to avoid new feeling and shall continue to enjoy the same patronage of the reading in this edition. This book is not meant to be an alternative to time-tested exhaustive textbooks on drug doses but meant to be a concise companion for all health professionals dealing with pediatric population.

In this edition, existing drugs are updated, a few drugs are omitted, and many more drugs are added. Although painstaking efforts have been made to find all errors and omissions, some errors may remain.

GL Chattri

Preface to the First Edition

I am pleased to have the opportunity to write this first edition of *Pediatric Drug Doses*. It is not intended to compete with the already well-established books. This book is designed to be a practical and convenient guide to the dosing and usage of medications in children.

Pediatric doses vary with the age, weight, surface area and disease, etc. Overdosing may lead to side effects and underdosing will lead to unsatisfactory response or development of resistance in cases of antibiotics.

I did not confine myself to doses only, but extended to provide indication, which is a must before knowing doses, and also included the information such as size of feeding tubes, Foley catheters, endotracheal tubes, laryngoscope blades, oxygen mask according to age and weight; approximate weight and surface area charts; fluid resuscitation formula for burn patients, so that residents do not have to consult too many books while dealing with patients bedside. The aim is to improve the practical utility of the book.

I have made all efforts to check for any mistakes in the text and drug doses, but nobody can be perfect. If you are in any doubt about a treatment or drug doses, always check with another formulary. Due to constant research, it is advised to consult package insert especially for infrequently used drugs and drugs with narrow therapeutic index.

I have written this book for pediatric house officers and registrars particularly keeping in mind, but it will also be useful for consultant pediatricians.

GL Chattri

Acknowledgments

First of all I would like to thank all my patients and their families who continue to aid us in our development as pediatricians and in the enrichment of our lives.

I thank to my wife Rashmi, my best friend, for her support and encouragement which made my dream true and my kids, Dhruv and Shlok, who spared me from their share of valuable time in writing this book.

I also thank to Mr Sanjeev Pandey, my friend for his selfless personal and professional support, which have made all this possible.

I sincerely thank Shri Jitendar P Vij (Group Chairman), Mr Ankit Vij (Group President) and Mr Tarun Duneja (Director-Publishing) of M/s Jaypee Brothers Medical Publishers (P) Ltd, New Delhi for publishing this book.

Last but not the least, I would like to thank Dr Sharad Thora, Dr Hemant Jain, and Dr Sameer Agarwal for their guidance and support.

Structure of the Book

All the drugs are listed in their respective group and are covered in short to make the book user-friendly. Drug information is presented in a consistent format and provides the following:

Generic Name: Indian adopted name.

Uses: Information pertaining to appropriate indications or uses of the drug.

Doses: The amount of drug to be typically given or taken during therapy in general and in certain specific conditions. For selected drugs, the dosing adjustment in renal and/or hepatic impairment should be made accordingly.

Brands: Common trade names available in India.

Combinations: If any.

So, if one has reached to the final or probable diagnosis, then this book will provide the remaining information—drugs which can be prescribed, dosages, brands and forms available, and mode of administration.

Contents

1. Analgesics	1
2. Antiasthmatics	11
3. Antiarrhythmics	16
4. Antibiotics	20
5. Anticoagulants	54
6. Antidepressants	56
7. Antidotes/Poisoning	59
8. Antiemetics	65
9. Antiepileptics	69
10. Antifungals	81
11. Antigout Agents	86
12. Anthelmintics	88
13. Antihistamines	92
14. Antihypertensives	97
15. Antileptotics	105
16. Antimalarials	106
17. Antimyasthenics	111
18. Antiprotozoals	113
19. Antipsychotics/Anxiolytics/Sedatives	116
20. Antiretrovirals	118
21. Antitubercular	123
22. Antispasmodics	126
23. Antitoxins	128
24. Antiulcers/Antisecretory	130
25. Antivirals	132
26. Cardiac Shocks and Failures	137

27. Chelating Agents	139
28. Colony-stimulating Factors	141
29. Corticosteroids	143
30. Diuretics	148
31. Drugs Used for Controlling Bleeding	152
32. Electrolyte Supplements and Fluid Replacements	154
33. H ₂ Antagonists	158
34. Immunoglobulins	159
35. Laxatives/Stool Softeners	163
36. Minerals	165
37. Nutritional Supplements	167
38. Pituitary Hormones	170
39. Plasma Volume Expanders	172
40. Scabicial Agents	174
41. Skeletal Muscle Relaxants	175
42. Skin/Acne Drugs	177
43. Sympathomimetics	179
44. Thyroid and Antithyroid Agents	182
45. Vaccines	184
46. Vasodilators	189
47. Vitamins	190
<i>Miscellaneous Drugs</i>	<i>195</i>
<i>Appendices</i>	<i>207</i>
<i>Index</i>	<i>219</i>

Symbols and Abbreviations

ACE	Angiotensin-converting Enzyme
ACTH	Adrenocorticotrophic Hormone
ADHD	Attention Deficit Hyperactivity Disorder
ADS	Antidiphtheric Serum
AEDS	Antiepileptic Drugs
AIDS	Acquired Immunodeficiency Syndrome
ANC	Absolute Neutrophil Count
AOM	Acute Otitis Media
APTT	Activated Partial Thromboplastin Time
ARF	Acute Renal Failure
AV	Atrioventricular Block
BA	Bronchial Asthma
BCG	Bacillus Calmette-Guérin
BD	Twice a Day
BP	Blood Pressure
BPD	Bronchopulmonary Dysplasia
BSA	Body Surface Area
CCID	Cell Culture Infective Dose
CHD	Congenital Heart Disease
CHF	Congestive Heart Failure
CLD	Chronic Lung Disease
CMV	Cytomegalovirus
CNS	Central Nervous System
CP	Cerebral Palsy
CPM	Chlorphenamine
CSF	Cerebrospinal Fluid

CSOM	Chronic Suppurative Otitis Media
DCL	Diffuse Cutaneous Leishmaniasis
DEC	Diethyl Carbamazine
DIC	Disseminated Intravascular Coagulation
DM	Diabetes Mellitus
DPT	Diphtheria, Pertussis and Tetanus
E/E	Eye/Ear
ECG	Electrocardiograph
ELISA	Enzyme-linked Immunosorbent Assay
ENT	Ear, Nose, and Throat
EPO	Erythropoietin
ET	Endotracheal Tube
G6PD	Glucose-6-Phosphate Dehydrogenase
GBHC	Gamma Benzene Hexachloride
GERD	Gastroesophageal Reflux Disease
g	Gram
GI	Gastrointestinal
HA	Headache
HBsAG	Surface Antigen of the Hepatitis B Virus
HDN	Hemolytic Disease of the Newborn
h	Hour
HIV	Human Immunodeficiency Virus
hs	At Bedtime
HSV	Herpes Simplex Virus
HT	Hypertension
HZV	Herpes Zoster Virus
ICP	Intracranial Pressure
ICT	Intracranial Tension
Id	Intradermal
Ig	Immunoglobulin
IM	Intramuscular
IPV	Inactivated Polio Vaccine

ITP	Idiopathic Thrombocytopenic Purpura
IVH	Intraventricular Hemorrhage
IVIG	Intravenous Immunoglobulin
IV	Intravenous
IVP	Intravenous Push
JRA	Juvenile Rheumatoid Arthritis
kg	Kilogram
LAB	Lactic Acid Bacillus
LBW	Low Birth Weight
LCL	Localized Cutaneous Leishmaniasis
LFT	Liver Function Test
LMWH	Low Molecular Weight Heparin
LRTI	Lower Respiratory Tract Infection
MDI	Metered-dose Inhaler
mg	Milligram
Min	Minute
mL	Milliliter
ML	Mucosal Leishmaniasis
MMR	Measles, Mumps and Rubella
MRSA	Methicillin-Resistant Staphylococcus aureus
N/V	Nausea/Vomiting
NB	Newborn
NEC	Necrotizing Enterocolitis
Ng	Nasogastric
NSAID	Non-steroidal Anti-inflammatory Drug
NS	Normal Saline
od	Once a Day
OM	Otitis Media
OPV	Oral Polio Vaccine
PCM	Paracetamol
PDA	Patent Ductus Arteriosus
PFU	Plaque-forming Unit

PM	Pyrimethamine
PNA	Postnatal Age
PO	Per Oral
PR	Per Rectum
PRP	Polyribosylribitol phosphate
PSVT	Paroxysmal Supraventricular Tachycardia
PT	Prothrombin Time
qid	Four Times Par Day
RDA	Recommended Daily Allowance
RDS	Respiratory Distress Syndrome
rHu EPO	Recombinant Human Erythropoietin
RSV	Respiratory Syncytial Virus
RT	Respiratory Tract
RTI	Respiratory Tract Infection
SC	Subcutaneous
SD	Sulfadoxine
SGPT	Serum Glutamic-pyruvic Transaminase
SLE	Systemic Lupus Erythematosus
SL	Sublingual
SMZ	Sulfamethoxazole
SSTI	Skin and Soft Tissue Infection
TB	Tuberculosis
tds	Thrice a Day
tid	Three Times a Day
TIG	Tetanus Immunoglobulin
TLC	Total Lung Capacity
TMP	Trimethoprim
TPN	Total Parenteral Nutrition
TT	Tetanus Toxoid
UMN	Upper Motor Neuron
URTI	Upper Respiratory Tract Infection
UTI	Urinary Tract Infection

VL	Visceral Leishmaniasis
VZIG	Varicella Zoster Immunoglobulin
VZV	Varicella Zoster Virus
WBC	White Blood Cell
μg	Microgram
<	Less Than
≤	Less Than or Equal to
>	Greater Than
≥	Greater Than or Equal to

Jaypee Brothers

Appendices

Appendix-1: Tables

Table 1: Equipment for resuscitation in various age group

Equipment	Premature	NB	6 month	1-2 year	5 year	8-10 year
Chest tubes	10-14 F	12-18 F	14-20 F	14-24 F	20-32 F	28-38 F
NG tubes	5 feeding	5-8 feeding	8 F	10 F	10-12 F	14-18 F
Foley's	5 feeding	5-8 feeding	8 F	10 F	10-12 F	12 F
O ₂ masks	NB	NB	Pediatric	Pediatric	Pediatric	Adult
ET tubes	2.5-3.0	3-3.5	3.5-4.5	4.0-4.5	5.0-5.5	5.5-6.5
Arm boards	6 inch	6 inch	6-8 inch	8 inch	8-15 inch	15 inch
BP cuff	NB	NB	Infant or child	Child	Child	Child or adult
Laryngoscope blade	0	1	1	1	2	Adult

Table 2: Fasting guidelines for sedation or anesthesia

Food	Hours of fasting required
Clear liquids	2
Breast milk	2-4
Formula or light meal (no fat)	6
Full meal	8

Table 3: Sedation techniques suggested for children

Procedure	Sedation and analgesia technique
Lumbar puncture	<ul style="list-style-type: none"> Local anesthesia with minimal/moderate sedation: <ul style="list-style-type: none"> Local anesthetics: Lidocaine/EMLA cream Minimal/Moderate sedation: Midazolam or sometimes Deep sedation: Fentanyl/Midazolam or Ketamine
Painful procedures: Biopsy of liver/kidney, bone marrow aspiration, fracture reduction, Drainage of abscess, burn debridement	Deep sedation combined with local anesthesia: As above
Laceration repair	Local anesthesia with minimal/moderate/deep sedation: As above
IV catheter placement	Local anesthesia and sometimes minimal/moderate sedation: As above

Table 4: Drip calculations

Drug	Dose	Calculation	Rate and dose
Dobutamine	5–20 µg/kg/min	$6 \times$ body weight (kg) is the milligram added to make 100 ml	1 mL/h = 1 µg/kg/min
Dopamine	2–20 µg/kg/min	$6 \times$ body weight (kg) is the milligram added to make 100 mL	1mL/h = 1 µg/kg/min
Epinephrine	0.1–1 µg/kg/min	$0.6 \times$ body weight (kg) is the milligram added to make 100 mL	1 mL/h = 0.1 µg/kg/min
Isoproterenol	0.1–1 µg/kg/min	$0.6 \times$ body weight (kg) is the milligram added to make 100 mL	1mL/h = 0.1 µg/kg/min
Lidocaine	20–50 µg/kg/min	120 mg in 100 mL of D5%	1 mL/kg/h = 20 µg/kg/min

- Patients ≤ 40 kg and those requiring fluid restriction may need more concentrated solutions in order to deliver less fluid per hour. In those cases or as an alternative to the listed calculations above, use the following equation:

$$\text{Rate (mL/h)} = \frac{\text{Dose } (\mu\text{g/kg/min} \times \text{weight (kg)} \times 60 \text{ min/h})}{\text{Concentration } (\mu\text{g/mL})}$$

Table 5: Treatment for drug extravasation

Medication extravasated	Cold/Warm pack	Treatment
Ischemic inducer		
Dobutamine Dopamine Epinephrine Norepinephrine Phenylephrine Vasopressin	None	Phentolamine: Mix 5 mg with 9 mL of NS. Inject a small amount of this solution into extravasated area. Blanching should reverse immediately. Monitor site, if blanching recur, additional injections of phentolamine may be needed.
Miscellaneous agents		
Aminophylline Calcium salts Dextrose Mannitol Phenytoin Contrast media Sodium bicarbonate Sodium chloride Tetracycline	Cold	Hyaluronidase: Add 1 mL NS to 150 units to make 15 units/mL. Administer 0.2 mL SC or intradermally into the extravasated site.

Table 6: Estimation of total body surface area of burn involvement (% by site and age)

Site	0–1 year	1–4 year	5–9 year	10–14 year	15 year	Adult
Head	9.5	8.5	6.5	5.5	4.5	3.5
Neck	0.5	0.5	0.5	0.5	0.5	0.5
Trunk	13	13	13	13	13	13

Contd..

Contd...

Site	0–1 year	1–4 year	5–9 year	10–14 year	15 year	Adult
Upper arm	2	2	2	2	2	2
Forearm	1.5	1.5	1.5	1.5	1.5	1.5
Hand	1.5	1.5	1.5	1.5	1.5	1.5
Perineum	1	1	1	1	1	1
Buttock	2.5	2.5	2.5	2.5	2.5	2.5
Thigh	2.75	3.25	4	4.25	4.5	4.75
Leg	2.5	2.5	2.75	3.00	3.25	3.5
Foot	1.75	1.75	1.75	1.75	1.75	1.75

Note:

1. The total body surface area of burn involvement is determined by the sum of the percentages of each site.
2. Applicable to second and third degree burns.
3. Percentage for each site is only for a single extremity with anterior or posterior involvement. Percentage should be doubled if both anterior and posterior involvement of a single extremity.

Parkland Fluid Replacement Formula

A guideline for replacement of deficits and ongoing losses (note: For infants, maintenance fluids may need to be added to this). Administer 4 mL/kg/percentage burn of Ringer's lactate (glucose may be added but beware of stress hyperglycemia) over the first 24 hours; half of this total is given over the first 8 hours calculated from the time of injury; the remaining half is given over the next 16 hours. The second 24 hours fluid requirements average 50%–75% of first day's requirements. Concentrations and rates best determined by monitoring weight, serum electrolytes, urine output, NG losses, etc.

Colloid may be added after 18–24 hours (1 g/kg/day of albumin) to maintain serum albumin > 2 g/100 mL.

Potassium is generally withheld for the first 48 hours due to the large amount of potassium that is released from damaged tissues. To manage serum electrolytes, monitor urine electrolytes twice weekly and replace calculated urine losses.

Table 7: Average weight and surface area

Age	Average weight (kg)*	Approximate surface area (m ²)
Weeks gestation		
26	0.9–1	0.1
30	1.3–1.5	0.12
32	1.6–2	0.15
38	2.9–3	0.2
40 (term infant at birth)	3.1–4	0.25
Months		
3	5	0.29
6	7	0.38
9	8	0.42
Years		
1	10	0.49
2	12	0.55
3	15	0.64
4	17	0.74
5	18	0.76
6	20	0.82
7	23	0.90
8	25	0.95
9	28	1.06
10	33	1.18
11	35	1.23
12	40	1.34
Adult	70	1.73

*Weights from age 3 months and over are rounded off to the nearest kilogram.

Table 8: Calculation of surface area from weight

Weight range	Surface area
1–5 kg	$(0.05 \times \text{weight}) + 0.05$
6–10 kg	$(0.04 \times \text{weight}) + 0.10$
11–20 kg	$(0.04 \times \text{weight}) + 0.20$
21–40 kg	$(0.02 \times \text{weight}) + 0.40$

In infants and children risk of fluid overload is always a consideration, when giving IV medications. Following table provides maximum concentrations and the maximum rate at which the medications can be given.

Table 9: Quick reference chart for IV medication

Drug	Maximum concentration	Maximum rate
Acyclovir	10 mg/mL	Give over 1 h
Adenosine	3 mg/mL	Give over 1–2 s
Amikacin	10 mg/mL	Give over 30 min
Aminophylline	25 mg/mL	25 mg/min
Amphotericin B	0.1 mg/mL	Give over 2–6 h
Ampicillin	100 mg/mL	10 mg/kg/min
Atropine	1 mg/mL	Give over 1 min
Calcium gluconate	100 mg/mL	100 mg/min
Cefazolin	20 mg/mL	Give over 10–60 min
Cefepime	160 mg/mL	Give over 30 min
Cefotaxime	60 mg/mL	Give over 10–30 min
Ceftazidime	40 mg/mL	Give over 10–30 min
Ceftriaxone	40 mg/mL	Give over 10–30 min
Cefuroxime	30 mg/mL	Give over 15–60 min

Contd...

Contd...

Drug	Maximum concentration	Maximum rate
Dexamethasone	10 mg/mL	Doses < 10 mg give over 1–4 min Doses > 10 mg give over 10–20 min
Diazepam	5 mg/mL	2 mg/min
Digoxin	100 µg/mL	Give over 5 min
Fosphenytoin	25 mg/mL	3 mg/kg/min
Gentamicin	40 mg/mL	Give over 30 min
Hydrocortisone	5 mg/mL	Give over 20–30 min
Ketamine	2 mg/mL	0.5 mg/kg/min
Lorazepam	4 mg/mL	0.05 mg/kg over 2–5 min
Meropenem	50 mg/mL	Give over 15–30 min
Methylprednisolone	2.5 mg/mL	Give over 20–60 min
Metoclopramide	5 mg/mL	Give over 1–2 min
Metronidazole	8 mg/mL	Give over 1 h
Midazolam	5 mg/mL	Give over 20–30 s (5 min in neonates)
Ondansetron	2 mg/mL	Give over 2–15 min
Phenobarbital	130 mg/mL	2 mg/kg/min
Phenytoin	50 mg/mL	3 mg/kg/min
Piperacillin	20 mg/mL	Give over 20–30 min
Ranitidine	2.5 mg/mL	10 mg/min
Vancomycin	5 mg/mL	Give over 60 min

Appendix-2: Administering Medicines

to Children

Medication administration to a pediatric population is a very difficult job. One child may take the particular product and form of medicine easily, but the another child may not accept the same.

Nurses and residents should learn following points for administering medicines to children:

1. In children oral route is preferred over parenteral. If not accepting one type of oral form try another form.
2. Special equipments are available for administering oral medicines, e.g. measuring cups and spoons, oral syringes, oral droppers, cylindrical dosing spoons. Parents should be taught to use calibrated devices provided with product rather than using household utensils.
3. In young children, it is better to give part of the dose at a time into the side of the cheek away from the bitter taste buds at the back of the tongue.
4. Prefer liquid preparation in children < 5 year of age and in > 5 year of age give dispersible or chewable form of medicines.
5. Maximum volume allowed in parenteral administration is subcutaneous = 0.5, intradermal = 0.01-1 mL, intramuscular 0.5-1 mL, intravenous = use smallest recommended diluent for dilution.
6. For IM prefer shorter ($\frac{1}{2}$ -1 inch) and smaller (23-30 G) needles.
7. Give IV via pediatric drip set with microdrip chamber.
8. For ID route use 1 mL syringes calibrated in 0.01 mL units 26-27 G needles.
9. For SC route use 1 mL syringes calibrated in 40 or 80 units and 25 G needles.
10. Always compare the ordered dose with the recommended

formulary dose based on a child's weight or BSA. Ordered dose is considered safe if it is less than or equal to the recommended formulary dose.

Jaypee Brothers

Appendix-3

General instructions on immunization:

1. Vaccination at birth means as early as possible or within 24–72 hours after birth or at least not later than 1 week after birth.
2. Whenever multiple vaccination are to be given simultaneously, they should be given within 24 hours if simultaneous administration is not feasible due to some reasons.
3. The recommended age in weeks/months/years means completed weeks/months/years.
4. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and possible.
5. Equivalent component vaccine combination use is preferred over separate injections.
6. When two or more live parenteral vaccines are not administered on the same day, they should be given at least 28 days apart. This does not apply to administration of live oral vaccines.
7. There should be a gap of 4 weeks between administration of two inactivated vaccines (this does not apply to rabies vaccination).
8. Different vaccines should not be mixed in the same syringe.
9. Patients should be observed for 15–20 min after vaccination in the clinic and hospital.
10. If necessary two vaccines can be given in the same limb at a single visit.
11. The distance separating two vaccines in the same limb should be minimum of 1 inch, so that local reaction do not overlap.
12. The anterolateral aspect of the thigh is the preferred site for two simultaneous IM injections.

Appendix-4

Age-based formula for selecting endotracheal tube size (internal diameter in millimeter):

- Uncuffed tube size (mm) = $\frac{\text{Age (yr)}}{4} + 4$
- Cuffed tube size (mm) = $\frac{\text{Age (yr)}}{4} + 3$

Jaypee Brothers