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Frontiers in
Social Pediatrics

SECOND EDITION

AK Patwari
HPS Sachdev

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Contents

Section 1: Evolution of Social Pediatrics in India

1. Social Pediatrics in India in the 21st Century 3
Vijay Kumar, Suresh Kumar Dalpath
History of Pediatrics in India *4*
Policy Portfolio *5*
Human Resource for Health *6*
Unfinished Agenda of 2015 *8*
Child Health Agenda Beyond 2015 *9*

Section: 2 Neonatal, Child and Adolescent Health

2. Effective Strategies for Improving Neonatal Health 23
Vinod Kumar Paul, Anu Thukral
Interventions/Strategies and their Impact *24*
Evidence-based Interventions which can Decrease Newborn Mortality *25*
Progress of Newborn Health Interventions *27*
Way Forward *29*

3. Integrated Management of Neonatal and Childhood Illness 30
AK Patwari
Evidence-based Interventions and Programatic Gaps *31*
Facility-based IMNCI *36*
IMNCI Implementation and Impact on Child Health *36*

4. Life-cycle Approach: Impact on Child Health 40
Rajesh Mehta
Newborn and Child Health in South-East Asia Region: Present Situation *40*
Links between Health at Different Life-stages *41*
Optimal Fetal Development *41*
Importance of Maternal Health *42*
Adolescent Pregnancy *42*
Birth Spacing *42*
Maternal Education *45*
Maternal Nutrition *45*
Maternal Health Risk Factors—Multiple Consequences *45*
Newborn Health *46*
Child Health and Development *46*
Importance of Life-cycle Approach *47*
Health Service Provision along the Continuums of Care: Gaps and Opportunities *47*
A Life-cycle Approach to Deliver Interventions *47*
Importance of Multi-sectoral Approach *49*
Government of India Response *49*

5. Early Childhood Development: Maximizing the Human Potential 51
Subodh Sharan Gupta, Abhishek Vijay Raut
Definition of Early Childhood Development (ECD) *52*
Rationale for Focusing on ECD *52*
Evidence that ECD is Effective *53*
Economics of Investing in ECD Programs *54*
Domains of ECD *54*
Helping Children Learn—Role of Family *55*
Approaches for Early Child Development *57*
India: ECD Situations and Opportunities *59*

6. Environmental Challenges to Child Health 65
P Ramesh Menon, Rakesh Lodha
Century of Climate Doctoring *65*
Children in Today's Environment *66*
Agents of Interaction in the Environment *66*
Implications for Pediatricians *70*

7. Childhood Tuberculosis 72
Varinder Singh, Kamal Kumar Singhal
Definitions Related to Tuberculosis *72*
Pathology *74*
Clinical Manifestations *74*
Investigations *76*
Treatment *79*
Drug Resistant Tuberculosis *80*
Prevention *81*
Chemoprophylaxis *81*
Prognosis *81*

8. Addressing the Mental Health Needs of Children and Adolescents 82
Alexis Aplasca, Tarun Dua, Chiara Servili
Developmental Disorders *83*
Behavioral Disorders *84*
The Way Forward *87*

9. Children Affected by HIV and AIDS in India 89
Jennifer Beard, Malcolm Bryant
Global Perspective on HIV and Children Affected by HIV *89*
Useful Terminology *90*
Historical Overview of HIV in India and the National Policy Response to Children Affected by HIV *91*
Important Successes though Much Work Remains: Prevention of Parent-to-Child Transmission and Universal Art *93*
Ongoing Challenges Faced by Children Affected by HIV *93*

10. Noncommunicable Diseases in Children: Emerging Health Challenge in India 98
Vaman V Khadilkar, Anuradha V Khadilkar
Determinants of Health Transition *99*
Burden of NCD *99*
Prevention Strategies: A Life Course Approach to NCD Prevention *100*

11. Indian Academy of Pediatrics Treatment Guidelines 104
Sakshi Sachdeva, Piyush Gupta
IAP Guidelines on Severe Acute Malnutrition *104*
IAP Guidelines on Tuberculosis *108*

IAP Guidelines for Acute Encephalitis Syndrome *109*
IAP Guidelines for Diagnosis and Treatment of Malaria *109*
IAP Guidelines on Management of Acute Diarrhea *111*
IAP Guidelines on Diagnosis and Management of Enteric Fever *112*
IAP Guidelines for Vitamin A Supplementation *113*
IAP Guidelines on Iron Deficiency Anemia *114*
Guidelines on Management of Pneumonia *115*

12. Newer Vaccines 117
Ajay Kalra, Vipin M Vashishtha
Hepatitis A Vaccines *117*
Inactivated Poliovirus Vaccine (IPV) *118*
Typhoid Vaccines *121*
Rotavirus Vaccines *124*
Influenza Vaccines *125*
Meningococcal Vaccines *126*
Japanese Encephalitis Vaccines *127*
Human Papillomavirus Vaccines *129*
Diphtheria, Acellular Pertussis and Tetanus Vaccines *130*
Varicella *132*
Pneumococcal Conjugate Vaccines *134*
Measles, Mumps and Rubella Vaccines *136*

13. Vaccine Safety and Surveillance of Adverse Events Following Immunization 137
Jyoti Joshi, S Aneja
Vaccine Safety *137*
Vaccine Safety in Immunization Programs *139*
Sifting Chaff from the Wheat: Causality Assessment of Reported Events *139*
Surveillance for Adverse Events in India *141*

Section 3: Nutrition

14. Maternal and Childhood Nutrition Priorities in South Asia 147
Sumathi Swaminathan, Anura Kurpad
Growth and Development *148*
Interventions that Work *154*

15. WHO Growth Charts 158
Mercedes de Onis
Rationale for Developing the WHO Child Growth Standards *159*
Design of the WHO Multicenter Growth Reference Study *159*
Construction of the WHO Child Growth Standards *159*
Innovative Aspects of the WHO Child Growth Standards *160*
Implications of Adopting the WHO Child Growth Standards for Public Health and Clinical Practice *162*
Potential Disadvantages of the WHO Child Growth Standards *163*

16. Infant and Young Child Feeding 167
Preeti Singh, S Aneja
What is Infant and Young Child Feeding (IYCF)? *168*
Feeding in Special Circumstances *171*
Trends and Challenges in Implementation of IYCF Practices in India *171*
Interventions to Improve IYCF Practices *173*

17. Breastfeeding and Working Women 176
Arun Gupta, Shoba Suri
Why Breastfeeding is Important? *176*
Current Status of Infant and Young Child Feeding Practices *177*
The State of Policy and Programs in Breastfeeding *177*
Social and Cultural Factors Influencing Breastfeeding *177*
What Kind of Support Working Women Need? *178*
Combining Work and Breastfeeding: Approaches *180*
The Way Forward *182*

18. Strategies for Prevention and Management of Malnutrition 184
Karanveer Singh, Praveen Kumar
Strategies to Prevent Malnutrition *186*
How can Malnutrition be Measured? *189*
What are the Types of Malnutrition? *190*
Severe Acute Malnutrition *191*

Section 4: Everyday Practice

19. The Art of Talking to Patients 199
Anshu, Tejinder Singh
Specific Skills Needed for Effective Communication *201*
Teaching and Learning Communication and Interpersonal Skills *204*
Assessment of Communication and Interpersonal Skills *205*

20. Ethical Issues in Pediatric Practice 211
Suvasini Sharma, Bhavna Dhingra
Informed Consent and Assent *211*
Care of Disabled Children *212*
Treatment of Critically-ill Children *212*
Religious or Cultural Objections to Medical Care *212*
Genetic Testing *213*
Medical Record *213*
Disclosure of Medical Errors *213*
Use of Electronic Media *213*
Confidentiality *214*

21. Medicolegal Aspects of Pediatric Practice 215
Mahesh Baldwa, Sushila Baldwa, Varsha Gupta, Namita Padvi
Medical Negligence and Malpractice *216*
Doctor-Patient Relationship *216*
Medicolegal Aspects of Consent and Risk Explanation *217*
Medical Record Keeping *220*
Sudden Operation Table Death during Anesthesia Resorting to Violence/ Extortion/Defamation by Party *220*
Medicolegal Aspects of Difficult Situations, Declaration of Death and Communication with Patient Party *222*
Medicolegal Aspects of Vicarious Liability *222*
Medicolegal Aspects of Euthanasia, DNR, Vegetative Life and Active and Passive Withdrawal of Life Support Systems *222*
Medicolegal Aspects of Blood Transfusion *223*
Medicolegal Aspects of Operating Theater Mishaps not Causing Death *223*
Medical Indemnity Policy *224*

22. Medical Audit in Pediatrics 225
Satish Pandya
Definition *225*
History of Medical Audit *226*
The Purpose of Clinical Audit *226*
The Clinical Audit Process—the Audit Cycle *226*
Techniques of Medical Audit *227*
Standards and Criteria of Medical Audit *227*
What to Audit? *228*
How to Audit? *228*
Equipment Needed *228*
Who should Evaluate? *229*
Limitations of Clinical Audit *229*
Other Methods *229*
Examples of Audit in Primary Care Pediatrics *229*
Identifying Areas for Medical Audit *230*
Advantages and Utilities of Medical Audit in Pediatrics *230*
Rational Drug Therapy and Medical Audit in India *230*
Difficulties in Medical Audit and their Solutions *231*
The Indian Scenario *232*
Epilogue *232*

Section 5: Legal Rights and Vulnerable Children

23. Child Rights 237
Mahesh Baldwa, Sushila Baldwa, Namita Padvi, Varsha Gupta
Rights of Children in General *238*
What are the Rights of the Children? *238*
Children's Rights and Our Five-Year Plans *238*
Children's Rights and Integrated Child Development Services (ICDS) Scheme *239*
Children's Rights and Universal Policy for Children *239*
Children's Rights and National Health Policy *239*
Detailed Study of Articles of Constitution of India Related to Rights of Children *239*
Constitutional Rights of Children and Child Labor *241*
Constitutional Rights and Disabled Children *241*
Constitutional Rights and Education of Children *241*
Objectives for India *241*
Future Outlook for Children's Rights *242*

24. Child Abuse and Neglect 243
RN Srivastava
Child Neglect *243*
Child Abuse/Maltreatment *244*
Street Children *244*
Types of Child Abuse *244*
Prevention of Child Abuse and Neglect *245*
Governmental Measures *246*
Constraints and Limitations *247*

25. Child Labor 249
Rajeev Seth, Uma Agrawal
Magnitude of Problem *249*
Categories of Child Labor *250*
The International Labor Organization (ILO) Declarations *251*
Indian Constitutional Provisions *252*
Action against Child Labor Rehabilitation and Intervention Strategies *252*
The Way Forward and World Day against Child Labor *255*

26. Legal Provisions for Children 257
Mahesh Baldwa, Sushila Baldwa, Namita Padvi, Varsha Gupta
Adoption *257*
Borstals *258*
Remand Homes *259*
Orphanages *259*
Foster Homes *260*
Boarding Schools *260*
Juvenile Delinquency *261*
The Protection of Children from Sexual Offences Act, 2012 *264*

Section 6: Clinical Epidemiology and Research

27. India's Integrated Disease Surveillance Project: An Appraisal 267
T Jacob John, V Jithesh
Health Management System *268*
Public Health Surveillance *269*
Attempts at Disease Surveillance in India: Successes and Failures *270*
The Integrated Disease Surveillance Project in India *272*

28. Health Indicators and Programmatic Implications 276
Harish Chellani, Aashima Dabas
Sources of Data *276*
Health Indicators—Concept and Need *277*
Current Situation and Trends *278*
Programmatic Approaches *279*
Programmatic Implications *280*
Critical Appraisal *281*

29. Introductory Research Methodology 284
Narendra K Arora, Rakesh Pillai, Sanjiv Kumar
What is the Rationale for doing Medical Research? *284*
Different Types of Research *284*
Good Practices in Medical Research *286*
Theoretical Work Flow of Research *286*
Establishing Causal Relationship *294*
Study Design *295*
Implementation Science *297*
Writing A Research Protocol *302*

30. Systematic Reviews and Meta-analysis: General Principles and Application for Child Health 305
Meenu Singh, Nishant Jaiswal
Systematic Review and Meta-analysis: Definitions and General Principles *306*

31. Ethical Issues in Biomedical Research involving Children 311
Suvasini Sharma, Naveen Sankhyan
Basic Ethical Principles and Research involving Children *311*
Current Guidelines and Regulations *312*
General Guidelines for Research involving Children *312*
Ethical Review Procedures *312*

Section 7: National Health Programs

32. National Health Mission: A Paradigm Shift in the Delivery of Reproductive and Child Health Services 319
Rajesh Kumar, Pritam Roy, Tarundeep Singh
National Health Mission *320*
Major Interventions *321*
Reproductive and Child Health Program–II (RCH-II) *326*
Monitoring and Evaluation *330*
National Urban Health Mission (NUHM) *332*
Future Prospects *332*

33. Maternal and Child Health Programs 335
Harish Chellani, Sugandha Arya
Situation Analysis *335*
Maternal and Child Health Programs and Interventions *336*
Monitoring, Information and Evaluation *343*
Critical Appraisal *343*

34. National Nutritional Anemia Control Program 346
Panna Choudhury
Approaches to Prevention of Anemia *348*
Supplementation Interventions by Ministry of Health and Family Welfare *349*
Management of Anemia *350*

35. National Nutritional Programs in India 354
Umesh Kapil, Neha Sareen
National Nutritional Anemia Control Program (NNACP) *354*
National Iodine Deficiency Disorders Control Program (NIDDCP): Current Status and Future Strategies *354*
National Prophylaxis Program against Nutritional Blindness due to Vitamin A Deficiency *358*
Mid-day Meal Program (MDM) *360*

36. Integrated Child Development Services Scheme 364
Umesh Kapil, Neha Sareen
Objectives *364*
Services Provided by the Scheme *364*
Population Norms in ICDS Project *366*
Existing Monitoring System Under ICDS Scheme *368*
Evaluation of ICDS Scheme *369*
Three Decades of ICDS—An Appraisal by NIPCCD (2006) *370*
Budget *370*
Areas of Weaknesses in ICDS Scheme *370*
Areas of Strengths of ICDS Scheme *371*
Participation of International Developmental Partners *371*

37. Pediatric HIV/AIDS 373
Jagdish Chandra, Anju Seth
Epidemiology *373*
Clinical Profile *374*
Diagnosis of HIV Infection *375*
Evaluation of the Patient Following Diagnosis *375*
Management Issues *375*
Preventive Aspects *377*
Feeding of HIV-Exposed Infants *379*
NACO and National AIDS Control Program *381*

38. National Immunization Program 383
Puneet Kumar, Vipin M Vashishtha
Universal Immunization Program (UIP) *384*
The Way Forward *387*

39. National Vector-borne Disease Control Program 392
Chandra Mohan Kumar
National Vector Borne Disease Control Program *392*

40. National Urban Health Program 396
Sainath Banerjee
Urban Health Scenario and Challenges *396*
The Need to Evolve an Urban Health Program in India *397*
National Urban Health Mission *398*
Major Components of National Urban Health Program *402*

41. Rashtriya Kishor Swasthya Karyakram 409
Sangeeta Yadav, Tanu Anand
Rashtriya Kishor Swasthya Karyakram *412*

42. School Health Program 423
JP Kapoor
International Experience *423*
National Experience *424*
Rashtriya Bal Swasthya Karyakarm *428*

43. Communication Networks in Child Survival Programs 430
AK Patwari
What are the Essentials of an ECN? *430*
Communication Skills of Health Personnel *432*
Health Infrastructure and Communication Channels *433*
Mothers/Caregivers—The Ultimate Target *434*

Index 437

CHAPTER 3

Integrated Management of Neonatal and Childhood Illness

AK Patwari

ABSTRACT

Integrated Management of Neonatal and Childhood Illness (IMNCI), a strategy fostering holistic approach to child health and development, is built upon successful experience gained from effective child health interventions like immunization, oral rehydration therapy, management of acute respiratory infections (ARI) and improved infant feeding. It is the Indian adapted version of the global strategy with a strong neonatal component and inclusion of home-based neonatal care. IMNCI strategy specifically focuses on enhancing the case management skills of healthcare providers, strengthening the overall health system and improving family and community health care practices. The core intervention is the integrated management of six most common causes of childhood deaths-perinatal conditions, ARI, diarrhea, measles, malaria and malnutrition. The IMNCI guidelines are based on the principles of integrated approach to under-five children for early detection of sick children who need to be referred to a higher health facility, management procedures use a limited number of essential drugs and caretakers are actively involved in the management process. With its curative, preventive and promotive elements, IMNCI strategy is a cost-effective approach to reduce under-five mortality in low- and middle- income countries.

INTRODUCTION

'Child Survival', a novel concept to accomplish a revolution in child survival and development, was introduced by UNICEF in 1983 within the paradigm of Selective Primary Health Care. This concept was aimed to target high-risk groups with carefully selected cost-effective interventions for under-five children, with a goal to reduce under-five mortality in Third World countries to half by year 2000. To begin with the strategy included Growth monitoring, Oral rehydration therapy, Breastfeeding and Immunization (GOBI) as a package of specific interventions to achieve the goal. This approach was further expanded to GOBI-FFF (GOBI with addition of Family Planning, Food supplementation and Female Education). However, the ultimate goal of reducing under-five mortality to half by year 2000 seemed distant even though several evidence-based effective interventions like immunization, oral rehydration therapy and use of appropriate antibiotics for treatment of pneumonia were available.

Projections based on global burden of disease analysis completed in 1996 indicated that acute respiratory infections, diarrheal diseases, measles, malaria and perinatal problems will continue to be major contributors to child deaths in the year 2020, unless significantly greater efforts were made to control them.[1] Encouraged by the lessons learnt from the past disease-specific vertical programs, WHO and UNICEF launched the Integrated Management of Childhood Illness (IMCI) strategy to respond to this challenge.[2] IMCI strategy has been implemented in more than 80 countries across the world, and each country is given an opportunity to adapt the guidelines as per local needs. Integrated Management of Neonatal and Childhood Illness (IMNCI) is the Indian adapted version of the strategy with a strong neonatal component and inclusion of home-based neonatal care.

IMNCI has a few distinguishing features from generic IMCI, which are: (i) Neonatal component of the IMNCI training program has been extended, (ii) Prevention and management of health conditions in the first week of life has been included, (iii) Focus of the strategy is on community-based health care providers: Anganwadi workers (AWW) and/or Accredited Social Health Activists

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(ASHA), and (iv) Home visits to all newborns in the first week of life for optimal care practices and identification of severe illness and referral. Addition of home visits in the IMNCI package makes it unique. Home visits by health workers (ANMs, AWWs, ASHAs and link volunteers) help mothers and families to understand and provide essential newborn care at home and detect and manage newborns with special needs due to low-birth weight or sickness. Three home visits are to be provided to every newborn starting with first visit on the day of birth (day 1) followed by visits on day 3 and day 7. For low-birth weight babies, 3 more visits (total of six visits) are to be undertaken before the baby is one month of age. The details of these visits are given in the training package. In addition, the opportunity of home visit is to be used for the care of mothers during the postpartum period. This will help mothers and families on how to recognize and manage minor conditions and will ensure timely referral of severe cases.[3] The strategy was introduced in India in 2003 in order to improve child survival intervention coverage and reach the fourth Millennium Development Goal (MDG 4).

EVIDENCE-BASED INTERVENTIONS AND PROGRAMATIC GAPS

The last century has been remarkable for several achievements in disease prevention and discovery of evidence-based effective interventions to manage sickness. Apart from eradication of smallpox from the globe, evidence-based effective interventions like oral rehydration therapy and zinc in diarrheal diseases, appropriate use of antibiotics in childhood pneumonia, promotion of exclusive breastfeeding and complementary feeding, prevention and control of infectious diseases and development of a host of newer vaccines has been an outstanding achievement over the years. However, with the back drop of continuing poor health indicators in low and middle-income countries, the gap between availability of evidence-based interventions and their effective implementation has not been effectively bridged so far. Broadly, there are three major reasons for this discordance pertaining to clinical skills of healthcare providers, health systems and health seeking behavior and related practices of community (Box 1).

Clinical skills of health professionals, working at different levels and working conditions, are quite variable in managing childhood illnesses. Contrary to what one would like to believe, clinical and communication skills of community health workers (CHWs) serving the community are yet to achieve a level of proficiency where common childhood illnesses could be managed at community level without burdening the health facilities at secondary or tertiary care levels. Despite imparting training and re-training of CHWs, there is a deficiency of trained manpower who can effectively use simple evidence-based interventions for managing common childhood illnesses. Apart from quality of training, the demand for number of CHWs who need to be trained in managing common childhood illnesses is huge which cannot be taken care with the existing in-service training programs for CHWs.

Box 1: Common problems that affect the quality of care provided to sick children at first-level health facilities

- Health worker skills
  - Incomplete examination
  - Poor communication between healthcare provider and the parents
  - Irrational use of drugs
- Health system issues
  - Poor access
  - Non-availability of appropriate/essential drugs
  - Lack of supervision/division of labor/organization of work
- Community and family practices care seeking behavior
  - Poor knowledge of when and where to seek healthcare when a child is sick
  - Poor knowledge of when to return to a health facility
  - Seeking assistance from unqualified providers
  - Poor adherence to healthcare provider advice and treatment

Lack of adequate supplies in the health facilities is another major reasons for CHWs not being able to perform optimally with whatever level of proficiency they have achieved in their clinical skills. Non-availability of round the clock free or low-cost essential drugs, Oral Rehydration Salts (ORS) and zinc, antibiotics for pneumonia and dysentery, antimalarials and other medicines is a major bottle neck, which hampers appropriate management of sick children.

Family and community perceptions and practices related to child health and sickness play a critical role in early identification and home management of children with sickness. Health seeking behavior of the community is a major factor in reducing childhood mortality. Success of community-based interventions require a strong partnership between healthcare providers and families, with support from their communities. Unless the tasks of improving key family practices is focussed upon, the desired impact on child mortality is not likely to happen.

IMNCI strategy specifically focuses on these 3 areas. It includes both preventive and curative interventions that aim to improve case management practices in health facilities, the health system and at home. The strategy includes three main components:

- Improvements in the case-management skills of healthcare providers
- Improvements in the overall health system

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- Improvements in family and community health care practices.

A. Improvements in the Case-Management Skills of Healthcare Providers

Improvements in the case-management skills of healthcare provider is aimed to be achieved by using a rational approach and evidence-based clinical guidelines for management of childhood illnesses. Clinical skills of the healthcare providers need to be improved with the help of a properly designed skill-based training with 'hands on practice'.

1. Rationale of IMNCI Approach

Common childhood illnesses like acute respiratory infections, diarrhea, measles, malaria, and malnutrition continue to result in high mortality among children less than 5 years of age. Neonatal mortality contributes to almost 2/3rd. of infant deaths and most of these deaths occur during the first week of life. Specifically targeting these common problems and assessing a child for other associated problems provides a holistic approach to manage common childhood illnesses. 'Integrated Approach' is therefore an effective step because often a young infant or child suffers from more than one illness and common childhood illnesses in this age group have similar presenting symptoms. Moreover, poor access to health care and delay in referral further compound the problem. Therefore, for early detection and prompt treatment of sickness in under five children, there is a need for holistic and integrated approach to childhood illnesses as well as improved access to health care by community.

2. IMNCI Clinical Guidelines

IMNCI clinical guidelines promoted by WHO and endorsed by Government of India,[4] target children less than 5 years old, the age group that bears the highest burden of deaths. It primarily caters to sick under-five children in a first-level health facility (outpatient settings in a hospital). The guidelines represent an evidence-based, syndromic approach to case management that includes rational, effective and affordable use of drugs and diagnostic tools. In situations where laboratory support and clinical resources are limited, the syndromic approach is a more realistic and cost-effective way to manage patients. Careful and systematic assessment of common symptoms, using well-selected reliable clinical signs, helps to guide rational and effective actions. An evidence-based syndromic approach is used to determine: (a) health problem(s) the child may have, (b) severity of the child's condition, and (c) actions that can be taken to care for the child (for example, refer the child immediately, manage with available resources, or manage at home).

IMNCI guidelines address ***most common***, but not all pediatric problems. The management procedures use a limited number of ***essential drugs***. Caretakers are ***actively involved*** in the treatment of children. Counseling of caretakers about ***home care*** is an essential component of IMNCI.

3. The Principles of Integrated Care

Depending on a child's age, various clinical signs and symptoms differ in their degrees of reliability and diagnostic value and importance. IMNCI clinical guidelines focus on neonates, infants as well as children up to 5 years of age. However, in view of similarities in the spectrum of illnesses, common clinical signs and management protocols, the treatment guidelines have been broadly described under two-age categories:

- Sick Young Infants age up to 2 months (SYI)
- Sick Children age 2 months up to 5 years (SC).

IMNCI Case Management Process (Fig. 1)

Steps of IMNCI Case Management Process are:

- Assess the young infant/child
- Classify the illness
- Identify treatment
- Treat the young infant/child
- Counsel the mother
- Follow up care.

Assess, Classify and Identify Treatment

The traditional approach of history taking, clinical examination, differential diagnosis and making a final diagnosis is simplified by asking a limited number of relevant questions, using a limited number of reliable clinical signs, 'classifying' under a broad group with a common management protocol and practising evidence-based therapeutic interventions in an algorithmic approach.

Using a simple ***"Ask, Look, Listen and Feel"*** approach all Sick Young Infants (SYI) are checked for very severe disease and jaundice, feeding problems and malnutrition, immunization status and other problems. They are also assessed for signs of dehydration if the SYI has diarrhea. All SC are checked for General Danger Signs, followed by assessment for main symptoms if they have cough or difficult breathing, diarrhea, fever or ear problems. All SC are checked for malnutrition, anemia, immunization status, prophylactic vitamin A and iron folic acid supplementation status, and other problems.

For classifying a SYI/SC, first presence of clinical signs in the '***pink color coded'*** box corresponding to particular

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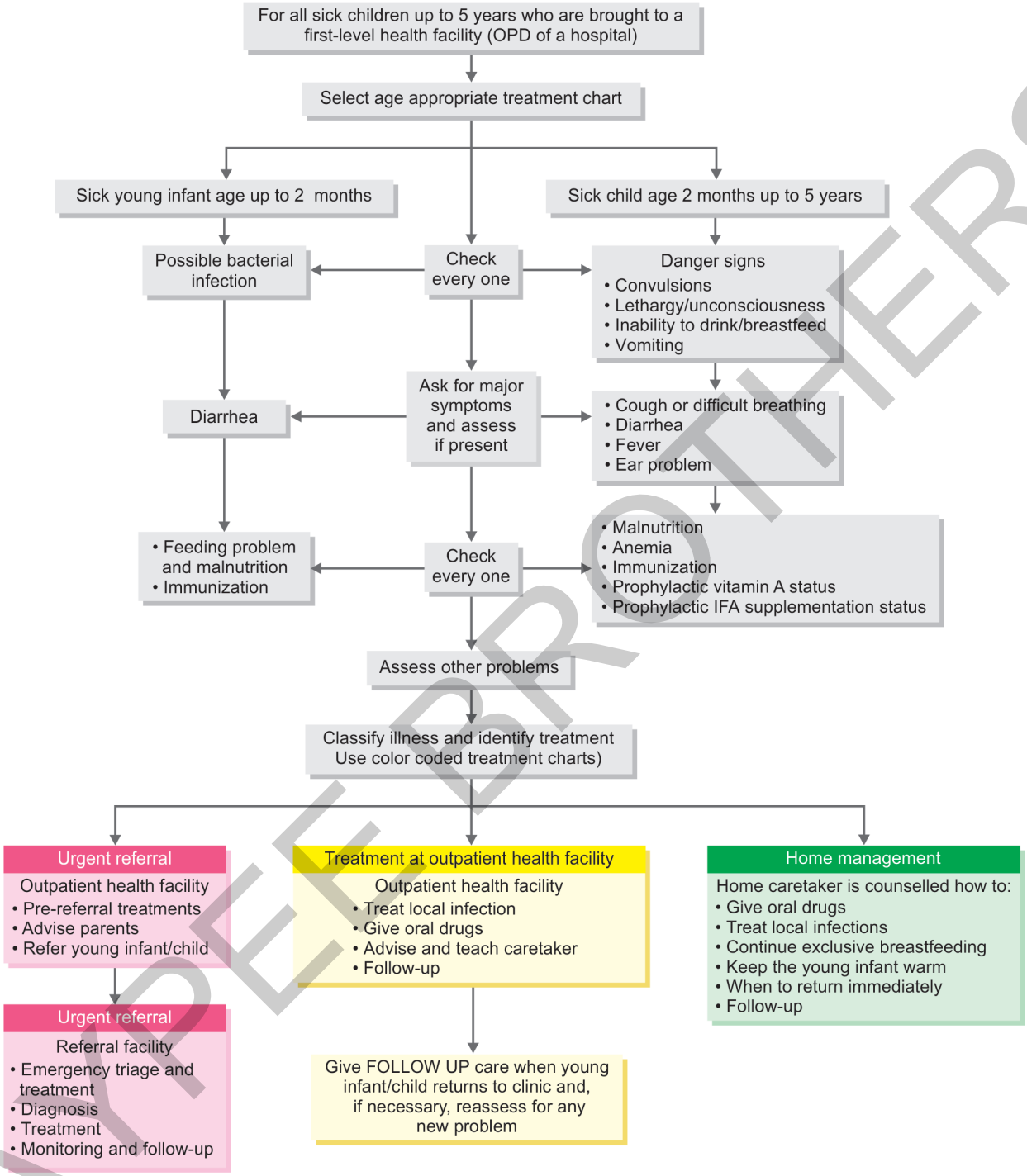

Fig. 1: IMNCI case management process

symptoms is checked. Presence of two or more clinical signs in the '***pink color coded'*** box classify the SYI/SC as **"pink"** (severe) classification. If there are less than 2 signs in the pink box, move down to check the "yellow color coded" box. Presence of two or more clinical signs in the '***yellow color coded'*** box classify the SYI/SC as **"yellow"** classification. If there are no sufficient signs in pink or yellow color coded rows a SYI/SC is assigned to ***"green"*** classification.

After classifying the SYI/SC, the next step is to identify treatment listed in the "Identify Treatment" column of the IMNCI chart.[3] SYI/SC with ***"pink"*** classification is required to be "Referred URGENTLY to hospital" after giving pre-referral treatment. Referral means referral to a higher

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level health facility with inpatient beds, supplies and expertise to treat a very sick young infant/child. Referral would also mean admission to the inpatient department from the outpatient/casualty of the same health facility. SYI/SC with ***"yellow"*** classification are managed in the facility/outpatients department for oral rehydration under observation or for giving the first dose of oral antibiotics, oral antimalarials and counseling. SYI/SC with ***"green"*** classification are managed at home.

Treat and Counsel

(a) Treatment of Sick Young Infants

Pre-referral treatment for "pink" classifications

1. Give the first dose of intramuscular antibiotics.
2. Treat to prevent low blood sugar
3. Warm the baby while arranging referral and teach the mother how to keep her baby warm on the way to the hospital
4. Continue breastfeeding if baby is able to feed
5. Give sips of ORS on the way to the hospital if SYI has diarrheal dehydration.

Treatment for "yellow" classifications

1. Teach the mother to apply 0.5% gentian violet for umbilicus that is red or draining pus and skin pustules, and 0.25% gentian violet for oral thrush.
2. Show the mother how to wick her child's ear dry
3. Give ORS for some dehydration
4. Teach correct positioning and attachment for breastfeeding
5. Teach the mother to manage breast and nipple problems
6. Teach the mother how to feed with a cup and spoon, wherever necessary.

Treatment for "green" classifications and counseling

1. Advise mother to give home care
2. Counsel about other feeding problems
3. Advise when to return ***immediately*** (if any of the danger signs is detected) or for **follow up**
4. Counsel the mother about her own health.

(b) Treatment of Sick Child

Pre-referral treatment for "pink" classifications

1. For convulsions give diazepam IV or rectally
2. Give the first dose of intramuscular antibiotics for severe pneumonia or very severe disease, very severe febrile disease, severe complicated measles and mastoiditis
3. Give first dose of intramuscular quinine for severe malaria
4. Treat severe dehydration with intravenous Ringer's lactate
5. Treat to prevent low blood sugar
6. Give one dose of paracetamol for fever
7. Give first dose of vitamin A in persistent diarrhea, severe complicated measles and severe malnutrition
8. Give sips of ORS on the way to the hospital if diarrheal dehydration.

Treatment for "yellow" and "green" Classifications

- Give the first dose of the antibiotics for pneumonia, dysentery, cholera, acute ear infection
- For malaria give Chloroquine/Artesunate depending upon risk area for malaria and rapid blood test/blood smear report
- Treat 'Some' and 'No' dehydration according to Plan B and Plan A, respectively, as per WHO Guidelines for treatment of dehydration[4]
- Give iron folic acid for treatment of anemia
- Use safe home remedies for cough and cold
- Teach the mother or caretaker how to treat the infection at home
- Feeding assessment of all children less than 2 years old and all children classified as anemia or very low weight
- Advise when to return ***immediately*** (if any of the danger signs is detected) or for **follow up**
- Advise the mother when to return for next immunization according to immunization schedule.

4. Training of Healthcare providers

(i) In-service training

Generic IMCI in-service training package for 8 days has been adapted to train Master Trainers who are expected to serve as IMNCI Facilitators (Trainers) for training of health workers at first-level health facilities.[5] The skill-based training is conducted by trained facilitators at large health facilities and district hospitals with a reasonable patient load necessary for demonstrating most of the clinical skills. The training course combines classroom work with hands on clinical practice. The trained facilitators conduct a 8 day training course at district hospitals for CHWs[3] to train them to apply the IMNCI standard case management approach for assessing, classifying and treating sick children from birth up to five years of age.

(ii) Pre-service training

IMNCI training has also been introduced in pre-service curriculum of students in some medical colleges, nursing schools, distance education and training of Anganwadi workers.

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(iii) Follow up after training

IMNCI training is not only focussed on *skill acquisition* of the CHWs but also their *skill reinforcement.* After the initial training, the CHWs may find it difficult to practise these skills in the first-level health facility and community for identifying and managing sick children. They may even lose some of these skills if not practised regularly. A follow-up visit, the second component of training, is therefore intended to reinforce the new skills and solve problems in the implementation of IMNCI. At least one follow-up visit is proposed to be conducted to help CHWs apply what they have learned during training. To accomplish this a follow-up visit is proposed to take place within four weeks after initial training in order to help them to get started.

The objectives of follow-up after training are to:

- Reinforce IMNCI skills and help health workers transfer these skills to clinical work in facilities;
- Identify problems faced by health workers in managing cases and help solve these problems; and
- Gather information on the performance of health workers and the conditions that influence performance, in order to improve the implementation of IMNCI.

A 2 day follow-up training is designed to improve supportive supervision skills of medical officers/ pediatricians and health/ICDS supervisors who will be involved in supervisory, monitoring, and follow-up functions of IMNCI implementation.[3] These trainers in turn train Supervisors who are expected to conduct follow up visits to the trained CHWs after the training.

B. Improvements in the Overall Health System

IMNCI strategy aims to strengthen the capacity of first-level health facilities to improve the quality of care delivered. The integrated approach of IMNCI increases the efficiency of health care service delivery through appropriate assessment of common childhood illnesses, rational use of drugs and counseling the caretakers. The resources needed to implement IMNCI like drugs and supplies, human resources, and transport for referral also overlap with those needed for other components of a basic package of health services. Therefore apart from addressing the health of the child in a holistic way, introduction of IMNCI strategy generates a demand for these resources and its inclusion in the basic package of health services avoids the duplication in structure, organization and management of separate childhood disease control programs.

The basic IMCI strategy is expected to play an important role in most aspects of health sector reform, in particular through:[6]

- Improving the cost-effectiveness of essential child health care services
- Strengthening the capacity for decentralized management at district level
- Improving the quality of child health care
- Improving private health care provision for young children
- Cost saving
- Strengthening drug supply and management.

C. Improvements in Family and Community Health Care Practices

Implementation of earlier health programs have highlighted time and again that success in reducing childhood mortality requires more than the availability of adequate health services with well-trained personnel. As families have the major responsibility for caring for their children, success requires a partnership between health workers and families, with support from their communities. Therefore, health workers need to work with families and their communities to ensure that families can provide adequate home care to support the healthy growth and development of their children. Families also need to be able to respond appropriately when their children are sick, seeking appropriate and timely assistance when children need additional care and giving recommended treatments. To provide the desired care, families need *knowledge, skills, motivation* and *support*. The families also need support from the health system, in the form of accessible clinics and responsive services, and health workers able to give effective advice, drugs and more complex treatments when necessary.

Improving family and community practices is the third important component of IMNCI strategy. Based on available evidence WHO suggests following actions to improve family and community practices:[7]

- Breastfeeding infants exclusively for at least four months and, if possible, up to six months. (Mothers found to be HIV positive require counseling about possible alternatives to breastfeeding.)
- Starting at about six months of age, feed children freshly prepared energy and nutrient rich complementary foods, while continuing to breastfeed up to two years or longer
- Ensure that children receive adequate amounts of micronutrients (vitamin A and iron in particular), either in their diet or through supplementation
- Dispose of feces, including children's feces, safely; and wash hands after defecation, before preparing meals and before feeding children
- Take children as scheduled to complete a full course of immunizations (BCG, DPT, OPV, and measles) before their first birthday

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- Protect children in malaria-endemic areas, by ensuring that they sleep under insecticide-treated bed nets
- Continue to feed and offer more fluids, including breastmilk, to children when they are sick
- Give sick children appropriate home treatment for infections
- Recognize when sick children need treatment outside the home and seek care from appropriate providers
- Follow the health worker's advice about treatment, follow-up and referral
- Ensure that every pregnant woman has adequate antenatal care. This includes having at least four antenatal visits with an appropriate health care provider, and receiving the recommended doses of the tetanus toxoid vaccination
- The mother also needs support from her family and community in seeking care at the time of delivery and during the postpartum and lactation period.

FACILITY-BASED IMNCI

Introduction of IMNCI strategy clearly offers several benefits to children in areas where it is implemented. Experience from across the world has demonstrated improvement in health-worker performance, better quality of care, increased use of health services and rational drug use at costs that are lower or similar to investments in routine child health services.[8] However, IMCI/IMNCI approach has been perceived as a strategy with limited scope because of its relevance to peripheral health facilities commonly manned by health workers. Over the years implementation of IMNCI strategy at primary care level was not linked to standard clinical medicine practiced in the hospitals. Moreover, for the management of very sick young infants/children the guidelines stop short at referral of ***pink*** classifications to a hospital. Uncertainty about continuum of care to the next level as per IMNCI guidelines has been a great influence on health workers' confidence while handling sick children at a first-level health facility in the field.

The Government of India has developed "Facility-based IMNCI (F-IMNCI)" guidelines for care of children under the age five years after they are referred to a hospital with ***"pink"*** classification/s, or delivered in the hospital itself or directly brought to the hospital.[9] These guidelines are directed at small hospitals where basic laboratory facilities and inexpensive essential drugs are available. Concept of F-IMNCI recognizes the importance of evidence-based IMNCI guidelines as practiced by the healthcare providers at first level facilities and describes a sequential process for managing sick young infants and children as soon as they arrive in hospital. It also introduces a change in IMNCI approach from "*classification*" of illness to making a clinical *"diagnosis".* F-IMNCI guidelines are consistent and support IMNCI training materials for outpatient management of young infants/sick children. These evidence-based guidelines also complement standard comprehensive pediatric textbooks.

F-IMNCI guidelines provide appropriate inpatient management of the major causes of neonatal and childhood mortality such as asphyxia, sepsis, meningitis, diarrhea, neonatal jaundice, tetanus neonatorum and low-birth weight in neonates; and pneumonia, pleural effusion/empyema, asthma, stridor, diarrhea, malaria, dengue fever, meningitis, typhoid fever, severe anemia and severe acute malnutrition in children up to the age of 5 years.

The treatment guidelines include Emergency Triage and Treatment (ETAT), care at birth, neonatal transport, management in a neonatal care unit, and management in postnatal and pediatric ward. F-IMNCI also trains healthcare providers in oxygen administration, use of inhalers/spacers, starting intraosseous line, pulse oximetry and diagnostic procedures.[10] A continuum of care to sick children in a hospital as per F-IMNCI guidelines brings credence to IMNCI case management guidelines for managing a huge population of under-five children in areas with limited access to hospitals. Figure 2 describes steps in the management of sick young infants and children admitted to hospital. Immediately after admission sick young infants and children go through a process of emergency triage assessment and treatment (Figure 3).

IMNCI IMPLEMENTATION AND IMPACT ON CHILD HEALTH

The generic IMCI package developed by WHO/UNICEF was initially implemented in more than 80 countries after local adaptations. The initial experience of introduction and scaling up of IMCI in several countries highlighted several indirect indicators which endorsed its validity as a comprehensive and effective strategy. As a result of introducing IMCI several countries revised and updated their child health policies, streamlined their essential drug lists for children and some introduced district level cost recovery mechanisms for IMCI drugs. Based on initial impact evaluation results, IMCI has been shown to lead system improvements at first level facilities particularly with regard to more comprehensive assessment, nutritional evaluation and review of immunization status. Considerable improvement was observed in the

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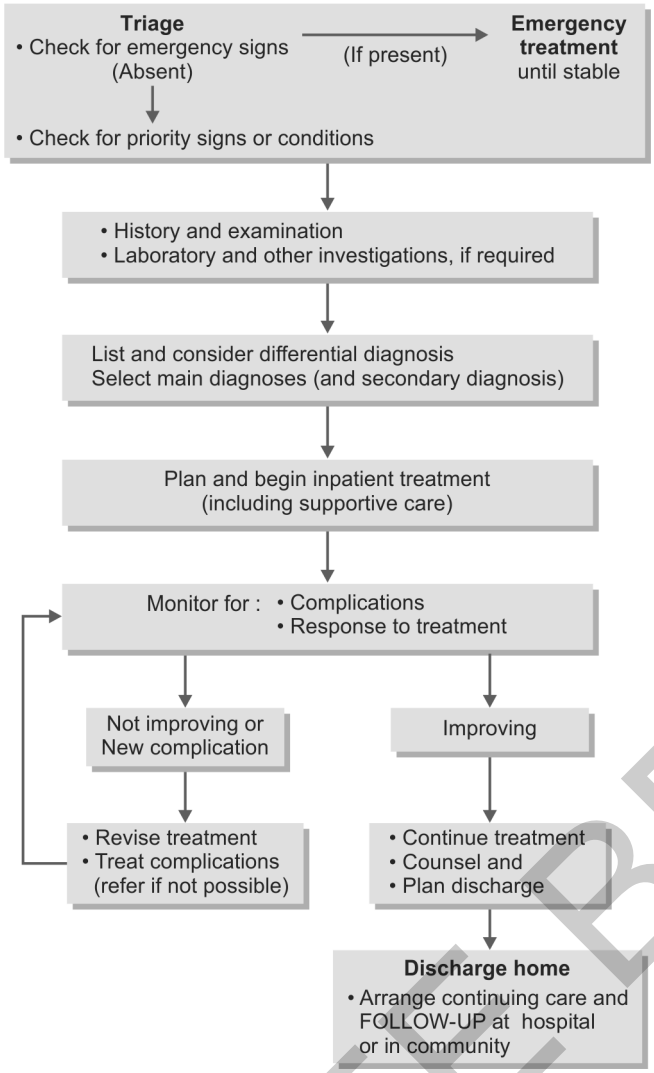

Fig. 2: F-IMNCI steps in the management of sick young infants and children admitted to hospital

availability of weighing scales, ORS and vitamin A. Other gains noticed with the introduction of IMCI included major changes in pharmaceutical use, referral practices, and reduced cost of medication, increase in exclusive breastfeeding rates, increase in mothers' knowledge about danger signs and home treatment.[8]

Apart from the experiences gained by individual countries during early phase of implementation, WHO conducted The Multi-Country Evaluation (MCE) of IMCI effectiveness, cost and impact. The evaluation results highlighted preliminary findings about IMCI and the performance of health workers, the challenges facing countries as they attempted to scale up IMCI, and the difficulties of implementing interventions to improve family practices at reasonable levels of coverage.[11,12] Health-system issues were found to severely limit the potential impact of IMCI. These included infrequent supervision, staff turnover, low morale of health workers, conflict between IMCI requirements and previously existing regulations, difficulties in scaling-up, and the low utilization of government health services in some countries. The community component–intended to act synergistically with the improvements in health services—had limited and spotty coverage in most countries.[11] A subsequent report continued to reinforce earlier messages: IMCI training for health workers managing children in first-level health facilities can lead to rapid and even sustained improvements in their performance; and efforts to implement interventions at family and community levels have been too slow and too widely dispersed to achieve even minimal coverage.[12]

In India, IMNCI has been considered as the central strategy within the National Reproductive and Child Health Program, along with skilled attendance at birth for all newborns and immunization-plus. The philosophy of IMNCI implementation is to initially introduce the strategy in some pilot districts, gain experience while implementing the strategy and then scale up and introduce in more districts. Thus, to begin with, implementation of IMNCI at household level was started in 2003. So far IMNCI has been operationalized in more than 500 districts. About 5.9 lakhs health functionaries (doctors, nurses, AWW and ASHA) have been trained and 26,800 medical officers and specialists placed at CHC/FRU trained under F-IMNCI.

During 2004–2008, 12 early-implementing districts had covered most key newborn and child practice indicators compared to the control districts. However, impact analysis showed that the difference was significant only for care-seeking for acute respiratory infection.[13]

More than 200,000 CHWs and first-level healthcare providers were trained during 2005–2009 at a variable pace across 223 districts in the country. Program data were analyzed to ascertain the implementation status; rapid program assessment was conducted for identifying the program bottlenecks; and results of analysis of two rounds of district-level household surveys were used for comparing the change in the coverage of child-health interventions in IMNCI and control districts. Of the reported births, 65.5% were visited by a trained worker within 24 hours, and 63.1% were visited three times within 10 days. However, poor supervision and inadequate essential supplies affected the performance of trained workers.[13]

In a cluster randomized controlled trial to assess the effect of implementation of IMNCI on neonatal and infant mortality, the infant mortality rate was significantly lower in the intervention clusters than in the control clusters.

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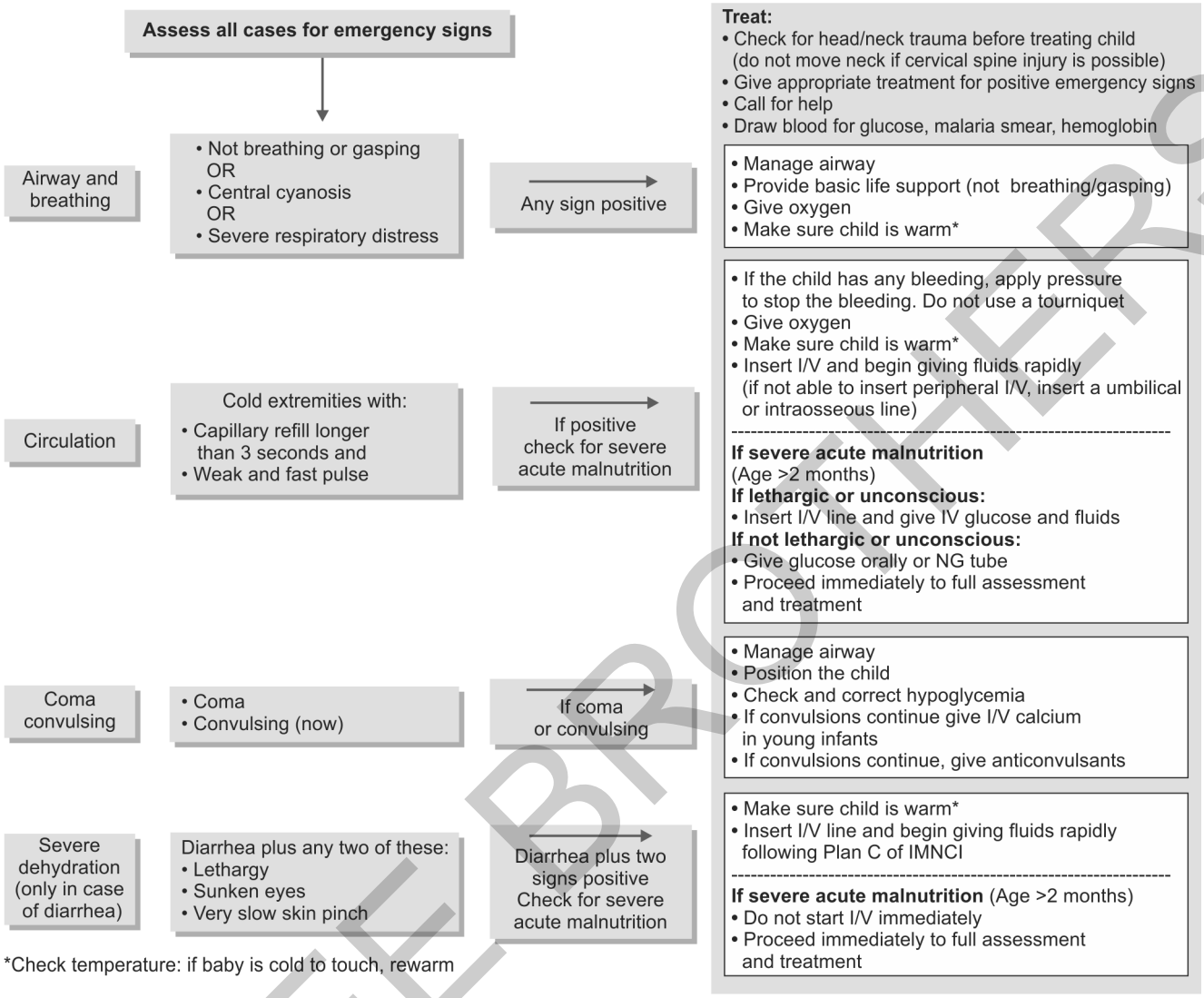

Fig. 3: Emergency triage assessment and treatment

The neonatal mortality rate was significantly lower in the intervention clusters in the subgroup born at home.[14]

Based on the early experience of IMNCI implementation in different states of India, measures need to be taken to improve supportive supervision, availability of essential supplies, and monitoring of the program if the strategy has to translate into improved child survival in India.

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