Department of Public Health and Family Welfare,
Maharashtra State

Vatsalya

Strengthening the continuum of care from the pre-pregnancy period till 1000 days of life

Medical Officer Training Module

Index

Section	Topic	Page No
1	Vatsalya Program:Introduction	1
2	Preconception Intervention Package -Introduction	4
	2.1 Achieving Normal BMI Prior to Pregnancy	6
	2.2 Preventing and treating anemia with Iron	9
	2.3 Periconception Folic Acid Supplementation	11
	2.4 Quitting Tobacco and Alcohol	12
	2.5 Preventing Pregnancy in Adolescents and Promoting optimal Interpregnancy Interval	14
	2.6 Preventing Reproductive Tract Infections (RTIs) and HIV Infection	16
	2.7 Detecting & Managing Chronic Diseases Before Pregnancy	19
	2.8 Operationalization of pre-conception care	23
3	Interventions during Pregnancy	24
	3.1. Prenatal Care	24
	3.2 Screening for Nutritional Anaemia Prevention and Correction	30
	3.3. Preventing Pre-eclampsia	32
	3.4. Preventing Neonatal Tetanus and adult diphtheria	33
	3.5 Preventing Influenza during Pregnancy by Inactivated vaccine	33
	3.6 Syphilis Screening & Case Management During Pregnancy	34
	3.7. Prevention of parent to child transmission of HIV	35
	3.8 Screening for Rh Factor: Preventing Rh Isoimmunization	39
	3.9 Screening and Management of Diabetes Mellitus in Pregnancy	40
	3.10Role of health personnel	46
	3.11 Screening for Hypothyroidism during Pregnancy	47
	3.12 Monitoring Weight Gain During Pregnancy	49
	3.13. Monitoring Blood Pressure during Pregnancy	50
	3.14. Monitoring Danger Signs	55
	3.15 Reproductive Tract Infections (RTI), Sexually Transmitted Infections (STIs)	65
	3.16. Screening for Fetal Growth Restriction (IUGR)	68
	3.17. Preventing Fetal death	69
	3.18. Preventing Post-Term Pregnancy	71
	3.19. High Risk Pregnant Women: Detection & Line listing	72
4	Peripartum Interventions	74
	4.1 Clean and Safe Delivery Practices	74

	4.2 Birth Companion and Respectful Maternity Care	75
	4.3 Safe Childbirth Check List	79
	4.4 Care during Uncomplicated Labour	80
	4.5 Preventing Birth Asphyxia	88
	4.6 Detecting, Managing Postpartum Haemorrhage	89
	4.7 Detecting, Treating Puerperal Sepsis	96
5	Maternal Nutrition	99
6	Perinatal Mental Health	103
7	Preconception Care for Men	108
8	Early Childhood Development	112
	1. Nurturing care framework and its Importance	112
	1.1 Good health	112
	1.2 Adequate nutrition	112
	1.3 Responsivecaregiving	112
	1.4 Early learning opportunities	112
	1.5 Safe environment	112
	1.6 Significance of the first 1000 days	113
	2. Good health	116
	2.1 Home Based Newborn Care	116
	2.2 Kangaroo Mother Care	117
	2.3 Visible birth defects	118
	2.4 Home Based Care for Young Child	119
	3. Adequate nutrition	121
	3.1 Exclusive breastfeeding	121
	3.2 Complementary feeding	124
	3.3 Responsive feeding	125
	3.4 Micronutrients	126
	3.5 Growth monitoring	129
	4. Responsive parenting	133
	5.Early learning opportunities	134
	6.Safety and Security	135
	7.Routine immunization	136
	8.Developmental delays and disabilities	137

Abbrevations

AFASS - Affordable, Feasible, Acceptable, Safe, Sustainable
AFI - Amniotic Fluid Index
AGA - Appropriate for Gestational Age
AIDS- Acquired Immune Deficiency Syndrome
AMTSL - Active Management of Third Stage of Labour
ANC - Antenatal care
ANM - Auxiliary Nurse Midwifery
APH - Ante-Partum Hemorrhage
ART - Anti-Retroviral Therapy
ARM - Artificial Rupture of Membrane
ARDS - Acute Respiratory Syndrome
ASHA - Accredited Social Health Activist
ASD - Austin Spectrum Disorders

BDI - Beck Depressive Inventory
BMI - Body Mass Index
BSL - Blood Sugar Level
BV - Bacterial Vaginosis

CAC - Comprehensive Abortion Care
CCT - Control Cord Traction
CBC - Complete Blood Count
CEmONC - Comprehensive Emergency Obstetric Neonatal Care
CTZ DS - Co-Trimoxazole Double Strength
CPD - Cephalo-Pelvic Disproportion
CV - Candidial Vaginitis

D & A - Disrespect and Abuse
DBS - Dry Blood Spot
DEIC - District Early Intervention Centre
DFMC - Daily Foetal Movement Count
DIC - Disseminated Intravascular Coagulation
DMHP - District Mental Health Program
DMPA - Depot-Medroxyprogesterone Acetate
DBCP - Dibromo Chloropropane
EC - Eligible Couple
EDD - Expected Date of Delivery
EID - Early Infant Diagnosis
EPS - Extra Pyramidal Symptoms
EPDS - Edinburgh Postnatal Depression Scale

FHR - Fetal Heart Rate
FRU - First Referral Unit

GAD-7 - Generalized Anxiety Disorder-7
GDM - Gestational Diabetes mellitus
GTN - Gestational trooblastic neoplasm
GUD - NH Genital Ulcer Disease - Non Herpetic
HBNC - Home Base Neonatal Care
HBYC - Home Base Young Child Care
HB - Hemoglobin
HbA1C - Glycosylated Hemoglobin test
HCW - Health Care Worker
HCP - Health Care Provider
HIV - Human Immunodeficiency Virus
HELLPs- Hemolysis, Elevated Liver Enzyme, Low Platelet count
HSV 2 - Herpes Simplex virus 2
ICTC- Integrated Counseling & Testing Centre
ICMR - Indian Council of Medical Research
IUD - Intrauterine Device
IUGR - Intrauterine Growth Retardation
INAP - Indian newborn Action Plan (2014)
IVF - In-vitro Fertilization

JSSK- Janani Shishu Suraksha Karyakram
JSY - Janani Suraksha Yojana

KMC - Kangaroo Mother Care

LAP - Low Abdominal Pain
LAIV - Live Attenuated Influenza Vaccine
LBW - Low Birth Weight
LGA - Large for Gestational Age
LMP - Last Menstrual Period
MAA - Mother Absolute Affection
MCH - Maternal Child Health
MCA PSV - Middle Cerebral Artery Peak Systolic Flow Velocity
MCV - Mean Corpuscle volume
MMR - Maternal Mortality Ratio
MNTs - medical nutritional therapy
MRP - Manual Removal of Placenta
MSDS - Mother Safety Data Sheet

NACO - National AIDS Control Organization
NBCC - New born Care Corner
NCD - Non-communicable Disease
NFHS - National Family Health Servey
NMR - Neonatal Mortality Rate
NTDs - Neural Tube Defects
NST- Non Stress Test

OGTT - Oral Glucose Tolerance Test
OS - Cervical Opening

PCC - Preconception Care
PE - Pedal Odema
PID - Pelvic Inflammatory Disease
PMH - Prenatal Mental Health
PMS - Post-maturity Syndrome

PMSMA - Pradhan Mantri Surakshit Matrutva Abhiyan
PPG - Post Prandial Glucose
PPPG -Post Prandial Plasma Glucose
PPTCT - Parent to Child Transmission
PPIUCD - Postpartum Intrauterine Device
PPH - Postpartum Hemorrhage
PPH Box - Postpartum Hemorrhage kit Box
PROM - Premature rupture of Membrane
PRBC - Plasma RBC

RDT - Rapid Diagnostic Test
RDS - Respiratory Distress Syndrome
RKSK - Rashtriya Kishori Swasthya Karyalram
RBSK - Rashtriya Bal Swasthya Karyalram
RMNCH+AH - Reproductive Maternal Neonatal Child Health +Adolescent Health
RTI - Reproductive Tract Infections
RPR test - Rapid Plasma Reagin test

SBA - Skilled Birth Assistance at birth
SCC - Safe Childbirth Checklist
SDG - Sustainable Development Goal
SGA - Small for Gestational Age
SIDS - Sudden Infant Death Syndrome
SNCU - Sick Newborn Care Unit
SSRIs - Serotonin Reuptake Inhibitors
SLE - Systematic Lupus Erythematous
STIs - Sexually Tract Infections
STDs - Sexually Transmitted Diseases

TSH - Thyroid Stimulating Hormones
TPHA-Treponema Pallidum Hemagglutination
TV - Trichomona Vaginitis

UBT - Uterine Balloon temponade
UD - Urethral Discharge
VHSNDs - Village Health Sanitation Nutrition Days
USG - Ultrasonography
UTI - Urinary Tract Infection

WBS - Wet Blood Spot

WHO - World Health Organization

Section 1 : Vatsalya Program : Introduction

Strengthening continuum of care from pre-pregnancy period to post-natal period till 1000 days to improve the maternal and child health outcomes

Introduction

"Vatsalya" is a comprehensive health promotion program to enhance and focus implementation of existing MCH services from Pre-Pregnancy period till postnatal period. It is designed to ensure an optimal environment for conception and support healthy foetal growth during pregnancy and perinatal outcome through continuous tracking of important indicators from Pre-pregnancy to Postnatal period. This program contributes existing maternal and child health initiatives to intensify the efforts to reduce maternal mortality and child mortality by reducing prevalence of Low Birth Weight.

“Vatsalya” emphasizes on the Pre-pregnancy period of life course continuum which will be extended to healthy pregnancies and healthy childbirth. Through the set of interventions, Vatsalya is intended to improve the pregnancy and child health outcomes. Major focus is on restoring maternal health in pre-pregnancy period, adequate maternal weight gain in pregnancy and reducing birth of low birth weight babies. It also promotes the health and well-being of women and couples.

There will be convergence of various health care and nutrition programs during this period in addition to comprehensive package of preventive, promotive and curative care for creating safe environment for conception and child growth during antenatal period.

Rationale

Worldwide, about 40% pregnancies are unplanned (WHO, 2013). These unexpected pregnancies often result in missed opportunities for the vital interventions before and during pregnancy to ensure a safe pregnancy for healthy outcomes. This highlights the significance of screening and initiation of health care from Pre- pregnancy period to ensure healthy pregnancy outcomes and its overall impact on child growth and development.

Pre-pregnancy phase is envisaged as the integral part of life course continuum. Although most of services intended for preconception care are being covered in RMNCH+AH matrix, a specific programme which will address the concerns about the preconception period is missing. After adolescence, when women enter their marital life, there is a gap in the continuum of services till the antenatal period. Even where strong public health programmes are in place following the life-course, they do not guarantee that women enter pregnancy in good health.

In 2013, WHO in its policy brief advocated about the building regional and national capacity to implement preconception programme. Further, INAP identifies preconception care as one of the six pillars of interventions across the life stages to impact still births and newborn health. Hence, it is required to make a comprehensive health programme which not only address the issues during preconception care but also extended its targeted interventions till the baby turns 2 years of age.

In accordance to SDGs and INAP, Maharashtra is committed to the achieve the goal of the single digit neonatal mortality by 2030. This emphasizes the need for the targeted interventions from pre-pregnancy period to first 1000 days of life to ensure the safe pregnancy outcomes and to achieve proper growth of development of child.

As a part of state strategy to prevent maternal and child mortality and morbidity, "Vatsalya" programme is envisaged to provide the package of promotive, preventive, and curative services by addressing the existing gaps in continuum of care.

Rationale:

- Healthy out comes of the pregnancy need an optimal environment for conception and foetal growth during pregnancy.
- Worldwide, about 40% of pregnancies are unplanned, resulting in missed opportunities for vital interventions before and during pregnancy
- The gap in the continuum of services after adolescence till the antenatal period needs to be addressed.
- Currently programmes do not guarantee that women enter pregnancy in good health.
- "Vatsalya"as astrategic in tervention package will range from preconception care to child care till the first 2 years of life.
- The"Vatsalya"program is designed to improve pregnancy and child health outcomes through a set of interventions.
- "Vatsalya"envisage convergence and effective monitoring of existing programs to improve maternal and child nutrition and health out come.

1. Objectives

Vatsalya programme is intended to reduce the all-preventable morbidity and mortalities among the mothers and child by preparing for conception and growth monitoring. It will ensure the quality health care from pre-pregnancy to first 1000 days of life of a child. Main objectives of the programme are given as follows;

- Reduce the prevalence of LBW and premature babies
- Reduce the prevalence of congenital birth defects
- Reduce the still births rate
- Improve the birth preparedness
- Improve the intake of ANC services
- Improved identification and follow up of high risk from pre-pregnancy period
- Ensure proper child growth and development through monitoring in his first 2 years of age.

2. Target beneficiaries

As health care services will be given from pre-pregnancy phase of life, primary beneficiaries of the programme will be unprotected eligible couples who are planning to have a baby. In addition, to follow the life course approach all pregnant women, lactating mothers, and children under 2 years of the age will be catered the health care services under the integrated package of Vatsalya. Target beneficiaries of the programme are enlisted as follows.

- Unprotected eligible couples
- Pregnant women
- Birth companion
- Lactating Mother
- Children under 2 years of age

Vatsalya Health Care Package

Vatsalya service package include comprehensive health services for pre-pregnancy care and also will be integrated with existing health programmes for high-risk pregnant women, safe delivery and children under 2 years of age.

This will include the following components;

- ✓ Pre-pregnancy care package to unprotected EC
- ✓ Identification and management of high risks during pre-pregnancy and antenatal period
- ✓ Strengthening of Mothers weight monitoring and IFA compliance in ANC period
- ✓ Ensuring appropriate Breast feeding & Complementary feeding practices
- ✓ Growth and Development monitoring of Children
- ✓ Integrating JSY, JSSK, MAA, Dakshata, PMSMA, HBNC, HBYC, RBSK, DEIC programs

Program Activities

1. Monthly check up of Eligible couples in the camps arranged at Village, SC & PHC level
2. Lab test, micronutrient supplementation
3. Identification and management of disease among EC
4. Counseling of EC for diet, nutrition, family planning methods etc.
5. Check up of high risk ANCs and management
6. Check up of children for growth monitoring and developmental delay
7. Referral of sick mother, children to higher facilities
8. Follow up of high risk EC, mother and children

Section 2 :Pre Conception Intervention Package

Preconception care (PCC):

Introduction -

Priority for reduction of LBW, neonatal mortality, still birth

Government of India launched India Newborn Action Plan (INAP) in 2014 with the objective of reducing the neonatal mortality to single digit per 1000 live births and still birth rates to single digit per 1000 total births by 2030. It defines the six pillars of the plan as :

1. Preconception and Antenatal care
2. Care during labour and childbirth
3. Immediate newborn care
4. Care of healthy newborn
5. care of small and sick newborn and
6. Care beyond newborn survival

The intervention packages having substantial impact on stillbirths and on neonatal mortality include:

- Care during labour and childbirth
- Preconception and antenatal care

The state of Maharashtra is also committed to achieve this goal of attaining single digit neonatal mortality rate and still birth rate by 2030.

The neonatal mortality rate of Maharashtra is 11/1000 live births which is 84.6 of IMR. (SRS India 2020).

The state has been already implementing the essential antenatal care, care during labour by skilled birth attendants, immediate newborn care of healthy newborn and resuscitation of newborn unable to initiate breathing at birth, care of low birth weight and sick newborn and other child health programs

1.2 Situation and Risk factors for LBW and preterm births in Maharashtra

Table 1: Current Status of Women In Reproductive Age Group In Maharashtra

Sr. no	Indicators	Total (%)	Rural (%)	Urban (%)
1	Women age 15-19 years who were already mothers or pregnant at the time of the NFHS 5 (%)	7.6	10.6	3.9
2	Women with Body Mass Index (BMI) <18.5 (%)	20.8	25	15.8
3	Women with Body Mass Index BMI≥ 25 (%)	23.4	18.3	29.6
4	Mothers who consumed iron folic acid for 180 days or more when they were pregnant (%)	30.9	28.8	33.6
5	Pregnant women age 15-49 years anemic (Hb<11.0 gm/dl) (%)	45.7	46.5	44.2
6	Non-pregnant women age 15-49 years who are anaemic (<12.0 g/dl) (%)	54.5	56.4	52.3

7	Mothers who had at least four ANC visits (%)	70.3	68.7	72.2
8	Women age 15 years and above who use any kind of tobacco (%)	10.9	14.7	6.6
9	Women who consumed alcohol (%)	0.4	0.5	0.3

(Source: NFHS 5)

Pre-conception care

- Preconception care is the provision of biomedical, behavioral and social health interventions to women and couples before conception occurs (WHO 2012).
- Preconception care is a set of interventions that are to be provided before pregnancy to promote the health and well-being of women and couples as well as to improve the pregnancy and child health outcomes.
- Every woman of reproductive age who is capable of becoming pregnant is a candidate for preconception care, regardless of whether she is planning to conceive.

Pre-conception Care Package

WHO in the policy brief released in 2013 has included the following interventions in the preconception package.

- Nutritional Interventions: Screening for anemia and diabetes, supplementing iron and folic acid, monitoring nutritional status, supplementing energy- and nutrient-dense food, and Iodization of salt
- Screening of women for tobacco and alcohol and counsel for cessation.
- Programs for reducing psychoactive substance use.
- Detailed family history to identify risk factors for genetic conditions, genetic counseling, carrier screening, testing and appropriate care.
- Providing guidance and information on environmental hazards and their prevention, avoiding unnecessary radiation exposure in occupational environment in medical setting, avoiding unnecessary pesticide use, protecting from lead exposure, counseling for reducing indoor pollution.
- Avoiding too,early, unwanted and rapid successive pregnancies by promoting contraceptive usage.
- Care of infertility.
- Preventing, detecting and managing STIs and HIV
- Reducing interpersonal violence.
- Assessing psychosocial problems and mental health issues.
- Vaccination against rubella, tetanus and diphtheria, Hepatitis B.

1.4 Reduction of maternal mortality through pre-conception care

Preconception counseling and education can help reducing the maternal ill health and adverse consequences. Correcting anaemia before conception can reduce the maternal deaths due to complications of very severe anaemia as well as due to obstetric complications like postpartum hemorrhage and sepsis. The indirect causes of maternal deaths such as heart disease can be better managed if diagnosed before conception. Infective conditions such as infective hepatitis, malaria, dengue, influenza can be largely controlled through behavior change for clean water, hand hygiene and other simple preventive interventions.

Maharashtra is currently in obstetric transition Stage IV (MMR < 50 maternal deaths/100 000 live births); during which there is a low fertility rate and indirect causes of maternal mortality, chronic-degenerative diseases like diabetes mellitus, hypertension, heart diseases

become predominant cause of mortality. Early detection and treatment of the chronic diseases during the pre-conception phase will save many lives of mothers.

2. Preconception Intervention Package

Preconception Intervention Package

Seven interventions have been selected based on the epidemiology and magnitude of the problem, feasibility in the primary health care setting, and resource availability. These interventions will be introduced at primary health care level to the eligible women planning their pregnancy before getting pregnant which will help in improving the health of pregnant women and their newborn babies.

1. Achieving normal BMI prior to pregnancy
2. Preventing and treating anaemia with iron and deworming medicine
3. Periconceptional folic acid to reduce neural tube defects
4. Quitting tobacco, alcohol to reduce birth & low birth weight baby.
5. Preventing pregnancy in adolescent girls to avoid hazards of teenage pregnancy and to have optimal inter pregnancy interval following miscarriage or childbirth
6. Detecting and treating RTI/STIs before pregnancy by creating reproductive health awareness in young couples
7. Detecting and managing chronic diseases before pregnancy

2.1 Achieving Normal BMI Prior to Pregnancy

2.1.1 Nutrition in adolescence

Adolescence is a period of rapid growth, during which adolescents require additional high-quality nutrients. Improving nutrition at household level, promoting sanitation and addressing gender issues are critical for improving nutrition before marriage. These interventions need to be initiated during adolescence and soon after marriage for improving birth outcomes. It is critical that every newly married woman and those wishing to conceive should have nutritional assessment to ensure that

- They have normal BMI (between 18.5 to 22.9) before they get pregnant
- They have normal blood haemoglobin (12 gram/dl) levels before they get pregnant
- They avoid getting pregnant below 19 years

The important nutritional interventions before pregnancy are summarized below.

2.1.2 Calculate pre-pregnancy BMI and optimize before conception

Pre- pregnancy BMI is an indicator to find the nutritional status of a reproductive age group woman. BMI is calculated from someone's height and weight by using following formula.

$$\textbf{BMI} = \textbf{Weight (kg)/Height (m)}^2$$

By recording height in meter and weight in kilograms accurately we can calculate BMI. By

using ready charts, we can estimate the BMI. BMI is a good indicator of women's nutritional status and it indicates if the woman has normal weight or if she is under weight (BMI< 18.5), is overweight (23 to 24.9 or obese (≥ 25 Kg /M^2)

BMI before Pregnancy

- BMI should be calculated for nutritional evaluation of women before pregnancy.
- Efforts should be taken before planning pregnancy to normalize BMI through nutritional support measures to increase or lower weight as needed. This can be done by promoting desired dietary changes and physical activity.

2.1.3. Maternal undernutrition and pregnancy outcome

BMI of <18.5 Kg/m^2 is associated with undernutrition. Woman having low pre-pregnancy Weight is at increased risk of having:

- Preterm delivery
- Intrauterine fetal growth restriction resulting in LBW baby.
- Perinatal death (Stillbirth + Early neonatal death within 7 days of life)

2.1.4 Obesity and Pregnancy Outcome

Overall 23.4% women have BMI ≥ 25 Kg/m^2 in Maharashtra. (NFHS-5) Maternal over nutrition resulting in obesity has adverse effects on health of mother and baby during pregnancy (Table 2). It is necessary to have normal weight before pregnancy for reducing neonatal problems.

Table 2. Effects of Obesity on Pregnancy (BMI ≥ 25 $Kg/m^{2)}$

Mother	**Baby**
Gestational Diabetes Mellitus	Fetal malformations: Neural tube defects, other defects (cardiac, GIT)
Chronic hypertension	Large for gestational age baby
Gestational hypertension, Pre-eclampsia	Injury to baby during difficult delivery
Post term pregnancy	Fetal growth restriction
Prolonged and difficult labour, CPD, Higher rates of caesarean section	Unexplained Stillbirth
Thrombophlebitis, Pelvic infection, UTI, wound infection	Prematurity
Post-partum anemia	Increased risk of neonatal mortality and morbidity

2.1.5 Obesity and Women's Health in general

- Obesity increases chances of having irregular menstruation, problems in having regular ovulation and infertility.
- Obesity increases risk of diabetes, chronic hypertension, heart disease in future life.

Table 3 shows the activities to be carried out for increasing or decreasing the body weight and thus the BMI among women.

Table3. Actions for various categories based on BMI

Underweight: BMI <18.5	Overweight | Obese
Counsel for four to five high-calorie healthy meals containing whole grains cereals like rice, wheat flour, dal, fruit, vegetables including green leafy vegetables, and healthy unsaturated oils like vegetable oils (Soybean oil, Canola oil, Sunflower oil, Peanut oil, Sesame oil), milk and milk products, fish, chicken, mutton and eggs whenever possible.	1. Have a healthy eating plan,
Monitor BMI regularly	2. Reduce quantity of food, limit junk food, sugar, oils and fats
Defer pregnancy till BMI is normal	3. Increase physical activity
If no improvement, consult the Medical Officer	4. Reduce sedentary time
	5. Defer pregnancy till recommended weight loss achieved
	6. Consult the medical officer

2.1.6 Role of health Personnel

ANM & CHO:

- Measure the woman's height and weight and calculate her BMI. Categorize her as normal, underweight, overweight or obese.
- Underweight woman: Ask woman's history of food consumption (frequency and diversity), eating habits, and socioeconomic status. Explain the influence of low BMI on maternal and perinatal outcome. Counsel her for supplementing energy rich nutrient dense food.
- If the woman has BMI $\geq$ 25 Kg/M^2, explain adverse effects of obesity on pregnancy outcome and need to have medical evaluation by Medical officer at PHC/RH. Counsel for diet planning, regular exercise and regular weighing.
- Explain the couple the need to postpone the pregnancy until the recommended weight loss is achieved. Discuss the various contraception options available and provide contraception of choice.
- Check weight every month to see whether there is expected change, check whether her diet is improved as suggested. See whether the couple is using contraceptives.

Medical Officer at PHC: Conduct complete physical examination and screen overweight women for any risk factors for diabetes mellitus and history suggestive of thyroid dysfunction. If at risk, get a glucose tolerance test (GTT) done to rule out diabetes mellitus and thyroid function test to rule out hypothyroidism. Give diet/exercise guidance. If the woman is obese, encourage to have at least 5-10% weight loss before planning pregnancy. Counsel for use of contraception till then.

DH Physician: If abnormal GTT or TSH levels, further investigations and treatment under guidance of an internal medicine specialist.

2.2 Preventing and Treating Anaemia with Iron

2.2.1 Facts about Anaemia

Prevalence:

- Adolescent girls and adult women should have haemoglobin of 12 gm/dl
- 45.7% of nonpregnant nonlactating women in reproductive age group in the state are anaemic (NFHS 5)
- Different studies indicate that about 1-3% of women are severely anaemic in Maharashtra.

Effects of anaemia

- Fatigue, fainting, reduced physical capacity and work performance.
- There may be difficulty in memorizing, reduced IQ and reduced school performance.
- Lowered immunity to fight against microbes with increased chances of getting infections causing repeated illnesses.
- Anaemia in adolescence if undetected persists in adulthood and is associated with an increased risk of anaemia during pregnancy showing adverse effects on mother's health.
- Anaemia is the underlying cause for 20-40 % of maternal deaths.
- Newborn baby of anemic woman is often premature and low birth weight.

Causes of anaemia

- Commonest cause of anaemia is dietary deficiency of iron, B_{12}, folic acid and proteins which are required for formation of haemoglobin.
- Worms take away the nutrients from body and some worms suck blood. i.e. worm infestations
- Excessive bleeding during menstruation or any bleeding can cause anaemia.
- Cerebral Malaria causes destruction of RBCs and leads to anaemia.
- Chronic infections, kidney disease also cause anaemia.
- Certain inherited disorders of haemoglobin formation (Sickle cell disease and thalassemia) can lead to severe recurrent anaemia. i.e. haemoglobinopathies.

Table 3. ***Effects of Anaemia on Pregnancy Outcome***

Maternal	Baby
Increased risk of cardiac failure	Fetal intra-uterine growth restriction (IUGR) ,
Inability to withstand third stage hemorrhage, can go in shock with moderate blood loss	Prematurity
During Puerperium: Risk of puerperal sepsis, Poor establishment of lactation, Puerperal venous thrombosis , Pulmonary embolism	Poor stores of iron at birth, risk of anaemia during infancy

2.2.2 Detecting Anaemia in nonpregnant reproductive age women

- Looking for pallor on nail beds, palm of hand, tongue, eyes
- Blood testing for haemoglobin estimation
- Finding the severity of anaemia:
    - Mild anaemia: Hb 11.0-11.9 g/dl
    - Moderate anaemia: 8.0 - 10.9 g/dl

- Severe anaemia: < 8 g/dl

2.2.3 Treatment and prevention of anaemia with IFA tablets

Women having hemoglobin of 12 gm/dl or more: For preventing anaemia, give one iron and folic acid tablet containing 60 mg elemental iron + 500 mcg folic acid, (sugar-coated, red colour) once a week.

Women having mild (Hb: 11 to 11.9 gm/dl) or moderate anaemia (Hb: 8 to 10.9 gm/dl): Give two IFA tablets (each with 60 mg elemental iron and 500 mcg folic acid), once daily, for 3 months, orally. Follow up every month to check compliance. Repeat Hb after 3 months. If haemoglobin levels have improved to normal, discontinue daily treatment, but continue with the prophylactic IFA dose once a week.

- IFA tablets should be taken 2 hours after meals to get greater benefit.
- Coffee, tea, soft drinks, milk, calcium, magnesium interfere with iron absorption and hence should not be taken with iron.
- Vitamin C contained in citrus juice, tomato juice helps iron absorption.
- Counsel for nutritious diet containing foods rich in iron, vitamins, proteins and other nutrients (e.g. green leafy vegetables, whole-grains, jaggary, lentils and beans, black gram, ground nuts, nuts, ragi, milk, poultry, meat, liver, eggs, fish).
- **Worms cause anaemia:** Give her tablet Albendazole, 400 mg orally, single dose. This should be repeated every 6 months. For preventing worm infestation, hand washing, use of toilet and proper food hygiene is important. Wearing a foot ware is necessary to prevent hook worm infection.

After taking tablets for 3 months if the haemoglobin fails to show a rise refer her to FRU/DH for investigations to determine the cause of anaemia. Complete blood count, peripheral blood smear ie smear for malarial parasite etc.

2.2.4 Management of severely anaemic women at FRU/DH

Girls/women who are having Hb below 8 gm/dl should be urgently referred to DH/FRU for evaluation and treatment.

2.2.5 Role of health Personnel

ANM/CHO:

- Test hemoglobin of every woman wishing to have a child and find out if she is anaemic and note the degree of anaemia. Explain her the consequences of anaemia during pregnancy
- If Hb 12 gm/dl, give IFA tablet once a week. Give her tab Albendazole and repeat it every 6 months. Explain her the importance of consumption of IFA tablet and maintain her Hb above 12 gm/dl before planning pregnancy
- If Hb is between 8 to 11.9 gm/dl. Give two IFA tablets once daily for 3 months. Repeat Hb after 3 months. Note the improvement. Refer to MO if no improvement
- Counsel the woman for balanced diet.
- Explain the couple the need to postpone the pregnancy until her hemoglobin level reaches 12 g/dl. Discuss the various contraception options available and provide contraception of the couple's choice.
- Ask her to make a monthly visit and see whether the woman is taking IFA tablets, check whether her diet is improved as suggested and whether the couple is using the contraceptive method.

- If Hb < 8 gm/dl: Refer to FRU. Follow her monthly.

MO PHC: Examine women having Hb < 8 gm/dl and look for any illness/complication requiring specialist opinion at DH. Perform basic investigations for finding cause. If Hb is above 6 gm/dl, treat with oral iron. See the response after 1 month. If no improvement, refer her to physician at district hospital. If Hb < 6, refer to DH directly.
DH: Investigations to find the cause and provide treatment. Blood transfusion for very severely anemic women.

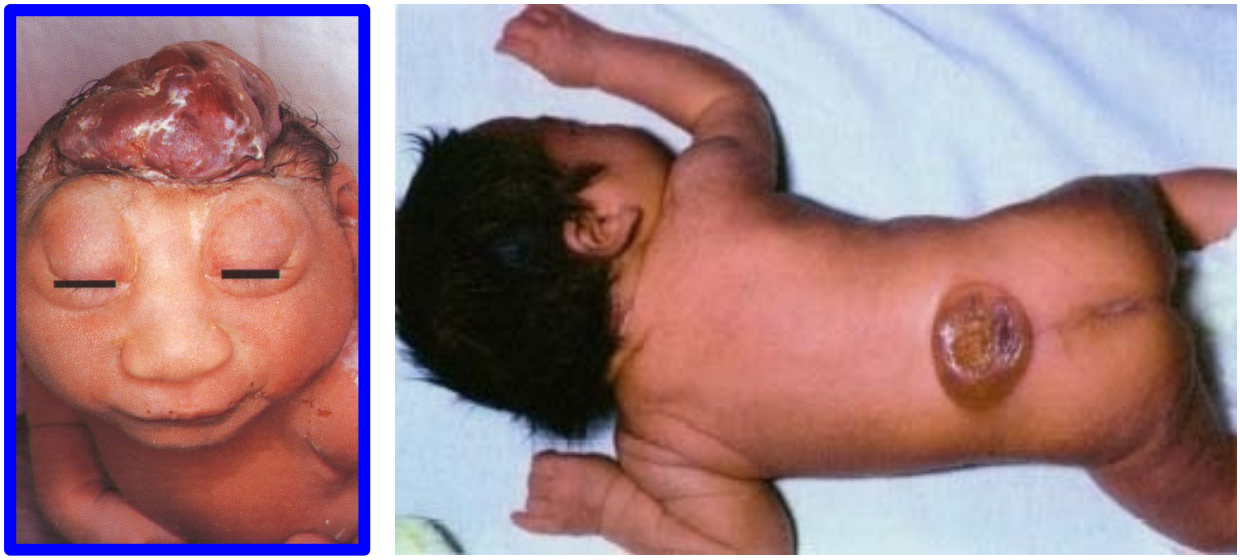
2.3 Periconception Folic Acid Supplementation

2.3.1 Rationale

Folic acid is one of the most important B-complex vitamins needed before and during pregnancy. Studies have shown that adequate intake diminishes the risk that a baby will suffer from neural tube defects (NTDs). The neural tube is the structure from which the brain and spinal cord develop during the first 3 months of gestation. If it does not mature and close properly by 28 days after conception, certain defects such as spina bifida, encephalocele and anencephaly can appear. Anencephalic baby cannot survive. Baby having spina bifida gets infantile paralysis, lack of sphincter control, and learning disabilities (Figure 9 A, B).

Figure 1.

A. Anencephalic Fetus **B. Miningomyelocele**



The following Women are at high risk for NTDs and other congenital malformations:

- History of giving birth to baby having NTD, Family history of NTDs
- Women who are taking antiepileptic medicines
- Women having diabetes
- Obese women with a BMI ≥25 kg/m^2
- Mothers with sickle cell anemia or thalassemia.
- Women having folic acid deficiency

2.3.2 Preventive intervention

Folic Acid: Periconceptional consumption of folic acid reduces the occurrence of neural tube defects by about 70%. Some women are at greater risk of giving birth to babies with NTDs. Folic acid reduces the risk in them also. It can also reduce the possibility of some other birth defects (cleft lip, cleft palate, cardiac defects).

All potential pregnant mothers: Administer folic acid 400 µg/day orally from three months before pregnancy to three months of pregnancy.

In women at high risk for NTDs: Administer 5 mg/day of folic acid from at least 3 months before pregnancy until 3 months of pregnancy.

Women should be encouraged to eat well, include vegetables and seasonal fruits in their diet. This helps in getting the vitamins and reduces the risk of LBW babies and birth defects.

2.3.3 Role of health Personnel

ANM:

- ASHA/ANM should visit every reproductive age group woman wishing to have a baby in near future and register her in the eligible couple register.
- If the woman wishes to have pregnancy soon, explain the benefits of starting folic acid tablets 3 months before pregnancy and continuing 3 months after conception and provide folic acid tablets.

2.3.4 Key Messages

- Nutritional imbalances can have adverse effects on pregnancy outcome.
  - Mother : Anaemia, hypertension, complications during delivery
  - Baby : Congenital malformations, preterm and low birth weight baby
- Nutritional interventions before pregnancy can improve the birth outcome.
- Women should plan pregnancy when the BMI is in normal range and anaemia is corrected with regular intake of IFA tablets and proper diet.
- Taking deworming medicine helps in reducing the risk of anaemia.
- Folic acid tablets taken before pregnancy reduce the chance of getting a baby having certain types of birth defects (neural tube defects).
- Adolescent girls/women of reproductive age should consume diet rich in micronutrients.

2.4 Quitting Tobacco and Alcohol

2.4.1 Tobacco Exposure

Tobacco smoke contains toxic substances which affect the fetal development. Nicotine reduces blood flow in the placenta and can induce a state of acute hypoxemia. Carbon monoxide increases the level of carboxy- hemoglobin in the blood of both mother and fetus, reduces oxygen transport and release of oxygen in the fetal tissues and organs, produces fetal hypoxia and affects fetal development.

- Consumption or exposure to tobacco during pregnancy is associated with LBW babies and perinatal death.
- Tobacco in any form is harmful. Smoking by mother and exposure to tobacco smoke when others smoke around the woman is harmful (Passive smoking). Dried/ roasted tobacco powder application to gums and teeth (*Misri*) is also associated with LBW.
- The minimum quantity of tobacco consumption causing problems is not known hence all tobacco consumption should be avoided throughout pregnancy.

2.4.2 Adverse effects of tobacco on pregnancy outcome

- Infertility, Miscarriage
- Baby is likely to be born preterm or to have LBW due to intrauterine growth restriction. One in every five babies born to mothers who smoke during pregnancy has LBW.
- Smoking can cause premature separation of placenta during pregnancy leading to antepartum hemorrhage.
- The risk of stillbirth is increased
- Babies born to women who smoke are more likely to have birth defects like cleft lip or cleft palate. Overall risk of congenital malformation is increased.
- Babies whose mothers smoke while pregnant and babies who are exposed to second hand smoke after birth are three times more likely to die from sudden infant death syndrome (SIDS) than babies who are not exposed to cigarette smoke.

2.4.3 Alcohol Consumption During Pregnancy

The children of pregnant women who drink alcohol during pregnancy suffer from many health problems such as poor growth, birth defects, low IQ or behavioural abnormalities which are called as Fetal Alcohol Syndrome (FAS). Alcohol can harm baby at any stage during a pregnancy even soon after conception. The effects last throughout life. There is no cure for these disorders. No minimum quantity is known that will not cause problem hence total quitting of alcohol is recommended.

2.4.4 Fetal Alcohol Syndrome

- Affected children have facial abnormalities, such as smooth ridge between the nose and upper lip (this ridge is called the philtrum), wide-set and narrow eyes (Figure 2A, 2B)
- Microcephaly (Small head size), mental retardation
- Low body weight, Shorter-than-average height
- Poor coordination, poor memory, difficulty with attention, poor reasoning, judgment skills, difficulty in school (especially with mathematics), learning disabilities, low IQ
- Mental health problems, hyperactive behaviours, severe tantrums, irritability, trouble getting along with others, difficulties with social interaction.
- Speech and language delays
- Difficulty in activities of day-to-day living (bathing, dressing etc.)
- Some children can have alcohol related birth defects: Vision or hearing problems, Problems with the heart, kidneys, or bones.

These disorders are completely preventable if a woman does not drink alcohol during pregnancy. If a woman is drinking alcohol during pregnancy, she should stop drinking. As the brain growth takes place throughout pregnancy, the sooner a woman stops drinking the safer it will be for her and her baby.

Figure 2. A. Fetal alcohol syndrome

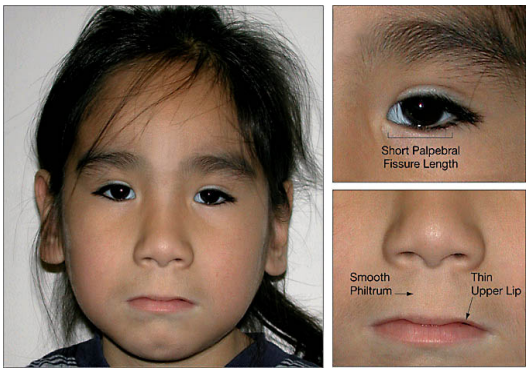
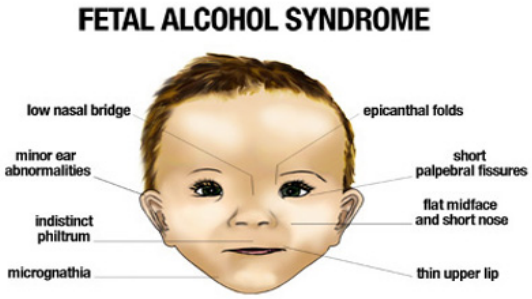


Figure 2. B. Fetal alcohol syndrome



2.4.5 Role of ASHA/ANM

- Screen every eligible woman wishing to have pregnancy for tobacco exposure, active as well as passive smoke exposure and for alcohol intake.
- Encourage her to stop smoking, misri application before becoming pregnant. Encourage her to stay in smoke free environment. Avoid all smoke.
- Educate her regarding adverse effects of tobacco and alcohol on the baby.
- Those women who drink alcohol should be encouraged to quit drinking alcohol for better development of child. Those wishing to quit and are finding it difficult to quit should be referred to medical officer who can then refer them to specialised caseation centre for help if needed.

2.5 Preventing pregnancy in Adolescents and promoting optimal interpregnancy interval

2.5.1 Pregnancy in Adolescents

Safe age for first pregnancy is between 21 and 35 years.

Pregnancy in adolescent age is a major challenge to the girl and her family. It can be in married adolescents following early marriage and non use of contraception till safe age for childbirth. It can be premarital pregnancy in an unwed girl.

Pregnancy in adolescence has many health problems. Height gain and development of bones is yet incomplete and stops due to pregnancy. The pelvic bones are not yet fully developed. This can cause prolonged and difficult labour. Chances of requiring operative delivery are high. Pregnancy complications like anaemia, hypertensive disease are more likely (Table 5).

Table - 5 Risks Associated with teenage pregnancy

Mother	Baby
Anemia	Pre-term delivery
Increased risk of Hypertension/Eclampsia	Fetal growth restriction/LBW
Difficult labour increasing chances of operative delivery	Increased perinatal mortality

Premarital pregnancy:Pregnancy in teenage girls can also be a premarital pregnancy due to rape / forced sex and lack of reproductive awareness. Risk taking behavior and peer pressure are contributory factor Premarital pregnancy is often hidden for long time and the girl is often getting deficient antenatal care due to neglect. There is a risk of unsafe abortion and its complications leading even to maternal death. Unsafe abortion is still responsible for about

8% maternal deaths in India. The girl can suffer domestic violence. Discontinuation of education, loss of carrier opportunities. It is necessary to create awareness amongst adolescent girls regarding risks associated with and methods for preventing unwanted pregnancy. Discussing contraception and safe abortion should not be a taboo.Adolescents can use condom, combined oral pills, emergency contraception pill. Insertion of copper intra uterine device(IUD) or3 monthly Injection Antara (DMPA) can be considered in nulliparous adolescents wishing to have longer duration of contraception.

2.5.2 Planning Pregnancy after Abortion

Ovulation resumes soon after abortion and woman can conceive by 10-14 days of spontaneous or induced abortion. Pregnancy within 6 months of abortion can be associated with increased risk of obstetric complications. Hence women should be counseled to postpone pregnancy for at least 6 months by using effective contraception.

2.5.3 Planning Pregnancy after childbirth

For improving health of woman and her young child, the interval between two childbirths should be at least 3 years. The recommended interval before attempting the next pregnancy after a live birth is at least 24 months.

Benefits of optimal inter pregnancy interval

- There is reduced risk of pregnancy complications. Mother has more time to improve her nutrition to support the next pregnancy. She can breastfeed longer and will be in a better position to take care of her baby, hence baby will get health and nutritional benefits. There is enhanced mother-baby bonding by breastfeeding, facilitating child's overall development.
- Short inter pregnancy interval is associated with increased risk of pregnancy complications and greater chance of having pre-term and LBW baby. If breastfeeding is stopped before 6 months, the newborn does not experience the benefits of breast milk and has diminished mother-baby bonding affecting baby's development.
- Resumption of ovulation after childbirth is somewhat unpredictable and depends on the breast-feeding pattern. In women who are not breast-feeding fertility can return by 4 weeks.
- In women not exclusively breast feeding, fertility can return by 6 weeks. Women should know that they can conceive even before getting first menstruation. Hence it is necessary to start using reliable contraception by 6 weeks after childbirth.
- For adequate spacing between two childbirths women can use IUCD, condoms and emergency contraception pills. The lactation amenorrhea method can be practiced soon after delivery until all 3 criteria are met (Effective if exclusive breast-feeding day & night, menses not returned, baby < 6 months old). They can also use new methods including Inj Antara, Progestin only pills, and Tab. Chhaya (Ormiloxefene) that are available at RH/SDH/DH. They can start using OC pills after 6 months of childbirth.
- Contraceptive counseling should include information about all available methods, their benefits, limitations and side effects. Women should be counseled on health aspects of family planning. Medical eligibility should be checked as per the check lists provided under the program.

2.5.4 Key Messages

- Counsel the adolescent girls to delay first pregnancy till the age of 21
- Interval between two childbirths should be at least 3 years.
- Women should postpone pregnancy for at least 6 months following an abortion.
- Hormonal emergency contraception should be used only as an emergency and not for regular contraception.

2.5.5 Role of health Personnel

ASHA:

- During monthly contact with reproductive age group women find out whether they wish to have a pregnancy and whether they are fit to have pregnancy.
- Counsel the couples about safe timing for conception, health risks of pregnancy during adolescence and short inter pregnancy interval.
- Refer the eligible couples to ANM for contraception counseling and care.
- Distribute the contraceptives as instructed by ANM/MO

ANM/MO:

Adolescent girls

- Encourage girls and their parents to continue school education of girls
- Encourage developing other abilities/skills (sports, languages, etc.) in them
- Create reproductive health awareness. Sexuality education (age appropriate)
- Empowering girls to resist forced sex
- Counseling parents for preventing early marriages
- Provide access to safe abortion at Comprehensive Abortion care Centre (CAC) for premarital pregnancies.

Reproductive age group women and couples

- Counsel adolescent married women aged <19 years regarding safe age for first pregnancy, available methods to postpone pregnancy, provide method specific counseling and contraceptive of choice
- Creating awareness regarding return of fertility after abortion and childbirth and health risks of short inter pregnancy interval
- Contraception counseling to avoid unintended pregnancy
- Provision of contraceptive method of choice
- Eliminate myths and misconceptions about contraceptive methods
- Referral of women having unwanted pregnancy to appropriate comprehensive abortion care centre.

2.6 Preventing Reproductive Tract Infections (RTIs) and HIV Infection

2.6.1 Background

Women often get infections in their reproductive organs, which are called as RTIs. The causes can be poor menstrual hygiene, unsafe abortion, unclean delivery and unsafe sex. The infections that are transmitted from an infected partner to an uninfected sexual partner during sexual intercourse are called sexually transmitted infections (STIs). Predominant mode of transmission of HIV is through unsafe sex. STIs affect both men and women, but the health

problems can be more serious in women. In women lesions are often not visible externally and women do not seek medical advice early.

- In women, some STIs can lead to infection of fallopian tubes and can result in infertility. In men, some STIs can cause infertility.
- STIs increase the chance of getting HIV infection.
- STIs in a pregnant woman can be transmitted to her baby

2.6.2 Effects of STIs on pregnancy

- Most infections can cause preterm births, LBW, premature rupture of membranes leading to neonatal infections
- Syphilis, a bacterial STI can cause stillbirth, congenital syphilis and neonatal death.
- Gonorrhoea, chlamydial infection can cause neonatal eye infection(conjunctivitis)
- HIV infected women can transmit the infection to their baby during pregnancy, labor, and through breastfeeding. (PPTCT)
- Genital herpes infection can cause neonatal herpes, pneumonia

2.6.3 Symptoms of RTI in women

- Vaginal discharge, vulval itching, difficult urination, frequency of urination
- Lower abdominal pain
- Ulcer, warty growth, painful vesicles and other lesions on private parts
- Swelling in groin region

2.6.4 Diagnosis

- Examination of external genitalia for any lesions, groin region for swollen lymph nodes
- Speculum examination: Look for mucopurulent cervicitis, inflamed vagina, offensive excessive watery frothy discharge. Sometimes discharge can be curdy white associated with intense itching (Candidiasis) or it can be grey white with a fishy odor (Bacterial vaginosis).
- Vaginal examination might be painful if the infection has ascended to pelvis (PID)
- Blood test: VDRL test can detect syphilis. HIV test can detect HIV infection.

2.6.5 Treatment

Women having symptoms suggestive of reproductive tract infection should be encouraged to report to the health centre and seek medical help to get cured from infection. Treatment is available from medical officer at PHC.

- There are kits of medicines provided for each group of symptoms (Syndrome)
- The counselor should encourage the women to have voluntary HIV testing
- The team at PHC should help the women to make informed decisions regarding pregnancy, specially care before and during pregnancy

National AIDS Control Organization (NACO), India has prepared drug treatment kits based on syndromic management of RTI/STI. After history taking, based on clinical examination and minimal investigations available, the couple will have diagnosis of the syndrome and will receive the treatment as per the color-coded kits provided under the program.

Table - 6 Content of STI/RTI drug kits

STI/RTI Syndromic diagnosis	Kit	Colour coding	Contents of the Kits
Urethral Discharge (UD), Cervicitis (CD), Ano-rectal discharge (ARD). Painful Scrotal Swelling (PSS), Presumptive treatment (PT)	Kit 1	Gray	1 tablet of Azithromycin (1 gram) or 2 tablets of Azithromycin (500 mg) and 1 tablet of Cefixime (400 mg)
Vaginitis (VD)	Kit 2	Green	1 tablet of Secnidazole (2 gram)/ 2 tablets of Secnidazole (1 gram) and Fluconazole (150 mg)
Genital Ulcer Disease Non-Herpetic (GUD-NH)	Kit 3	White	Injection Benzathine penicillin (2.4 MU) + 1 tablet of Azithromycin (1 gram) + distilled water 10 ml
Genital Ulcer Disease Non-Herpetic (GUD-NH)- for patients allergic to Penicillin	Kit 4	Blue	28 tablets or capsules of Doxycycline (100 mg) + 1 tablet of Azithromycin (1 gram)/ 2 tablets of Azithromycin (500 mg)
Genital Ulcer Disease-Herpetic (GUD-H)	Kit 5	Red	21 tablets of Acyclovir (400 mg)
Lower abdominal pain (LAP/PID)	Kit 6	Yellow	1 capsule of tablet Cefixime; 28 tablets of Metronidazole 400 mg. 28 tablets or capsules of Doxycycline (100 mg)
Inguinal bubo (IB)	Kit 7	Black	42 tablets or capsules of Doxycycline (100 mg) + 1 tablet of Azithromycin (1 gram)

HIV infected women can be guided to Anti Retroviral Treatment (ART)centre to receive ART medicines. ART can reduce the viral load to undetectable levels when the risk of transmission to baby is greatly reduced. They can make informed reproductive decisions by availing preconception care and modifying their childbirth plans. She can get other STIs treated before conception.

2.6.6. Counseling Messages

- RTIs can be prevented by proper menstrual hygiene, avoiding unsafe abortion and delivering in a hospital by skilled birth attendant (SBA).
- STIs can be prevented by following safe sex practices by avoiding premarital sex, being faithful to one sexual partner and by correct, consistent use of condom.
- STIs can be detected and treated with medicines that are available free of charge in Government health facilities. Most STIs (except viral STIs) can be cured by taking the complete course of medicines.

- Untreated RTIs and STIs increase the risk of getting HIV infection.
- Untreated persons having STI can spread the infection hence the sexual partner needs to take complete treatment.
- It is necessary to prevent getting STIs and HIV to protect the fetus from getting infected. HIV can be transmitted to the baby during pregnancy, delivery and breastfeeding. Knowing HIV status before pregnancy helps in taking measures to protect the baby.
- RTIs and STI can lead to infertility, miscarriages and other adverse effects on pregnancy outcome.

2.6.7 Role of health Personnel

ANM

- Creating awareness amongst the adolescents and young couples regarding the modes of transmission of HIV infection and other RTIs/STIs and ways of protecting themselves from getting infected.
- Counsel women having high risk behavior for risk reduction through behavioral change.
- Encourage them to know the HIV status by visiting ICTC and getting counseling regarding health interventions to stay healthy.

MO: Diagnosis of RTI/STI and treatment as per NACO guidelines

2.7 Detecting & Managing Chronic Diseases before Pregnancy

2.7.1 Background

Some diseases are known to have adverse effect on maternal health and pregnancy outcome.

- Diabetes mellitus
- Heart disease
- Chronic hypertension, Chronic kidney disease
- Epilepsy
- Thyroid disorders

Detecting and treating these diseases before pregnancy can improve the chances of successful pregnancy. Every eligible woman should be encouraged to make a visit to PHC medical officer for medical checkup before planning pregnancy. The details of health problems, medicines being taken should be told to doctor. Health checkup should be undertaken. Any health problem that requires special treatment before pregnancy should be discussed and necessary measures should be taken. Ongoing medicines for any disease need to be reviewed before pregnancy to check whether they are safe to continue during pregnancy.

2.7.2 Diabetes mellitus

Detecting and controlling diabetes before conception reduces the chances of birth defects and having macrosomic (large for dates) babies. Women who are obese or have a near relative who is diabetic are more likely to have diabetes. Women who had a stillbirth following loss of fetal movements, who had hypertension, Pre-eclampsia, gave birth to a large baby or baby having birth defects are more likely to have diabetes. Diabetes can be detected by testing the blood sugar levels in fasting state and after oral glucose. (OGTT) In general population the risk of severe birth defects is around 2-3%. In women having poorly controlled diabetes before pregnancy, the risk increases to 6-9% (Congenital cardiac diseases,NTDs, other). Well controlled DM prior to conception has been shown to reduce birth defect rate back to baseline

rate in the general population. Poor control can be known by testing blood for glycated haemoglobin (HbA1C).

- Women who had gestational diabetes in prior pregnancy should get their blood sugar and glycated hemoglobin checked and plan their pregnancy when diabetes is well controlled. (Hb A1C < 6.5%)
- If they are obese they should reduce their weight
- They should consume folic acid 5 mg daily starting 3 months prior to planned pregnancy to reduce the occurrence of baby with birth defects (Neural tube defects)

The diagnosis of diabetes mellitus is shown in table 7 below.

Table.7 Diagnosis of Diabetes Mellitus:

	Fasting Plasma Glucose mg/dl (No intake 8 hrs)	**2-hour plasma glucose after 75 gm glucose)**	**Random Plasma glucose**	**Hb A1C**
Normal	<100 mg/dl	< 140 mg/dl		< 5.7%
Increased risk of diabetes	100-125 mg/dl (impaired fasting glucose)	140-199 mg/dl (impaired glucose tolerance)		5.7-6.4%
Diabetes	≥126 mg/dl	≥ 200 mg/dl	200 mg/dl	≥ 6.5 %

About 12.4 % women (15-49 years of age) in the state had high or very high blood sugar >140 mg /dl and taking any medicine to control (NFHS 5).American diabetes association recommends that persons having BMI ≥ 25 (or Asians ≥ 23 Kg/m^2) with one or more additional risk factor for diabetes(first degree relative with diabetes, hypertension, PCOS, acanthosis nigricans, history of gestational diabetes) should be screened for diabetes mellitus. For all others, testing should begin at age 45 years.

2.7.2 Heart Disease

Some women have heart disease. Rheumatic fever in childhood can cause defects in the heart valves and can affect the function of heart. Some defects in the heart can be since birth (Congenital heart disease). The diseased heart cannot tolerate any excessive strain. Pregnancy puts an additional burden on the diseased heart. The women become breathless even with small activities. The risks of complications increase significantly. Heart disease worsens during pregnancy, delivery and soon after delivery. It can be life threatening for the woman. Pregnant woman's life is endangered due to cardiac failure, infection in the heart (bacterial endocarditis) and other complications. Baby is also likely to be preterm and LBW.

Symptoms:

- Some women may not have any symptoms.
- Breathlessness on less than usual exertion, fatigue, swelling over feet, syncope, chest pain. Sometimes she can become breathless even at rest, have cough at night with blood in sputum which is dangerous.

Signs:

- Auscultation of chest: Precordial murmurs, abnormal heart rhythm
- Signs of cardiac failure, crepitations at lung bases and unilateral pedal edema

Such woman should be referred to a specialist at FRU or district hospital. Electrocardiography, 2D Echo cardiography should be carried out as required to confirm the diagnosis. Women with signs of cardiac failure need immediate hospitalization under care of a specialist.

Management

Before conception- women with preexisting heart disease should receive counseling regarding maternal and fetal risks during pregnancy. Some defects in heart can be corrected by surgery on heart before pregnancy. Some girls having heart disease are operated by heart surgeon and are receiving some special medicines to avoid clot formation of blood. (anticoagulants). These women should consult a specialist before planning pregnancy as their medicine plan needs to be changed during pregnancy for safety of baby. It is important to report to specialist soon after confirmation of pregnancy. Anaemia increases the risk of heart failure and should be corrected before planning pregnancy. Any infection, (urinary, respiratory, dental) increases the risk of heart failure and needs to be treated promptly.

2.7.3 Chronic Hypertension & Chronic Renal Disease

The women who are having chronic hypertension before becoming pregnant are at high risk of developing Pre-eclampsia during pregnancy. The women need to visit a physician to find the severity of hypertension, cause of their high blood pressure and the medicines to control blood pressure. They must also discuss about their intentions to go for a pregnancy and find out about their fitness for the same before planning pregnancy.About 23% of women (15-49 years) in the state had Elevated blood pressure (Systolic ≥140 mm of Hg and/or Diastolic ≥90 mm of Hg) or taking medicine to control blood pressure (NFHS 5).

Women with chronic renal disease are at greater risk of chronic hypertension and development of Pre-eclampsia. They should discuss about the risks before planning pregnancy. Women having significant proteinuria and a previous history of kidney disease should undergo complete evaluation by a physician to find whether they have a renal disease.

2.7.4 Epilepsy

The women having epilepsy are receiving medicines to keep their fits under control. Some of these medicines are having adverse effects on developing baby. The type of medicines and dose of antiepileptic drugs taken by the mother during the first trimester have impact on the risk of major congenital malformations in the baby. Thalidomide antipsychotic drug causes limb abnormality

Medical consultation and counseling before planning pregnancy helps women to reduce the risk of having a baby with a malformation by reducing the number of drugs, the dose and switching over to less harmful drugs before pregnancy. They should discuss the appropriate time for conception with their physician. Folic acid 5 mg daily should be started 3 months before conception. Diet should be rich in micronutrients.

Association of some anticonvulsant medicines with birth defects is known. (e.g. Valproate, Phenobarbitone). Selecting a relatively safe drug, lowest possible effective dose, single drug as against multiple drugs can be some strategies to be discussed prior to conception. Some women are receiving medications for years after a seizure and for them discontinuation of medication may be considered in consultation with specialist.

2.7.5 Thyroid disorders

Thyroid hormone deficiency in women can cause irregular menstruation, inability to conceive and recurrent abortions. There is increased risk of Pre-eclampsia, placental abruption and post-partum hemorrhage. Common cause of thyroid hormone deficiency is deficient intake of iodine leading to a condition called Hypothyroidism.Iodine deficiency during pregnancy can result in poor mental development of child with poor IQ. Consumption of iodized salt in diet helps preventing iodine deficiency. proper storage of iodized salt is also important.

Clinical picture raising suspicion of hypothyroidism includes fatigue, lethargy, weakness, sleepiness, constipation, loss of hair, menstrual irregularities, infertility, recurrent miscarriages, weight gain, hypertension, dry skin and enlarged thyroid.

Hypothyroidism can be diagnosed by blood test. Thyroid stimulating hormone (TSH) levels are done first. If TSH levels are elevated, complete thyroid function tests are to be carried out. The woman should be referred to physician at district hospital for further care. Hypothyroidism is treated by levothyroxine tablets taken orally early morning on empty stomach. The women who are diagnosed to have hypothyroidism should plan pregnancy when their TSH level is normal. The dose of thyroid hormone needs to be increased during pregnancy as pregnancy progresses and TSH levels need to be monitored periodically. Such woman should be under care of specialist soon after detection of pregnancy and throughout pregnancy for adjusting the dose of levothyroxine.

2.7.6 Screening for Hemoglobinopathy carrier state:

Prevalence of thalassemia carrier state is around 3-4 % and sickle cell hemoglobinopathy is common in tribal population and certain communities in India. If both partners are carriers the chance of having an affected baby is 25%. The affected babies suffer from severe anaemia requiring repeated blood transfusions throughout life and treatment to take care of iron overload. Screening for carrier state has been recommended in premarital, preconception as well as during early pregnancy. It is to be performed only once

Preconception screening for detection of carrier state of abnormal hemoglobin should be offered to couples with appropriate genetic counseling. Blood indices and tube tests (solubility test for sickle cell hemoglobinopathy and Nestroff for thalassemia) can be done in PHC setting. Any woman with positive tube test or severe anaemia should be referred to district hospital for CBC and HPLC. If she is found to be a carrier her spouse should be tested for his carrier status. If both are found to be carriers, then referral to a higher centre is required for genetic counseling(GOI 2016)

2.7.7 Roles and responsibility of Health Personnel

- ANM will encourage every eligible woman to have a health check up by the medical officer
- MO PHC will conduct the preconception risk assessment and health checkup of every registered woman as recommended.
- MO will detect and treat anaemia, epilepsy, hypertension, cardiac disease, RTI, goiter, obesity, tuberculosis, psychiatric disorders. Review history of ongoing medicines
- Refer to physician at DH as necessary for further evaluation and treatment

- Physician at DH will see all the referred women, conduct their health assessment and provide the necessary preconception care and counseling regarding safe timing for having pregnancy.

2.8 Operationalization of pre-conception care

The preconception care will be implemented along with other RMNCH+AH activities in the population. During the monthly home visit to eligible couples, ASHA will conduct behaviour change communication on the need of pre-conception care and counsel the women on nutrition, sexual and reproductive health, prevention of addiction. ASHA will refer the eligible women (preferably with their husbands) to the ANM on Village Health, Nutrition and Sanitation Day (VHNSDs).

ANM will review the list of eligible women from each village and register them for preconception care. She will screen the women for any preconception risk indicator and provide appropriate intervention.(Table 8). She will counsel the women having risk factors for preterm birth/LBW baby to postpone pregnancy until the risks are managed.The ANM will refer the eligible women to medical officer for a preconception health checkup. She will counsel and refer the women reporting pathological vaginal discharge along with their husband to PHC for treatment. She will follow the registered women monthly and record changes in weight, hemoglobin, contraceptive usage, addictions etc. with reinforced counseling. She will provide the necessary nutritional supplements (IFA prophylaxis/therapy), deworming, peri-conceptional folic acid and contraceptives as indicated.The ANM will complete the baseline information of each of the eligible women during the first visit in the format provided. During the follow up visits of the eligible women, ANM will complete the information in the format provided.ANM will note the women conceiving during the period of observation /intervention and register them for antenatal care.

Medical officer at PHC will conduct risk assessment and offer clinical care and will be responsible for overall implementation of preconception interventions in PHC population.Medical Officer will carry out the history taking, clinical examination and will provide necessary treatment. He will screen the women for chronic medical diseases needing attention before conception (severe anaemia, obesity, epilepsy, hypertension, cardiac disease, RTI, goiter, tuberculosis, thyroid dysfunction, psychiatric disorders) and will review any ongoing medicines. Refer the women having medical condition to physician at DH as necessary for further evaluation and treatment of severe anaemia, epilepsy, thyroid dysfunction, diabetes mellitus, suspected cardiac disease and any other significant health problem. Laboratory technician will collect blood for different laboratory tests as per protocol including hemoglobin, blood group ABO and Rh type, solubility test for sickle cell anemia, random blood sugar by glucometer, HIV, VDRL and serum TSH. Further investigations like oral glucose tolerance test, thyroid function tests, electrophoresis for sickle cell anemia will be performed as indicated.

Table 8 :Pre-conception Risk indicators: Check list for intervention

Status	Intervention
Age < 19 years	Defer pregnancy till age 20
BMI < 18.5 Kg/m^2	Increase weight: Nutrition guidance. Defer pregnancy till BMI improves
BMI > 25 Kg/m^2	Weight reduction. Medical checkup. Defer pregnancy till BMI optimization
Hemoglobin < 12 gm/dl	IFA tablets, deworming; Defer pregnancy till Hemoglobin is 12 gm/dl or more
Exposure to tobacco / Consumption of alcohol	Counseling to quit
Willing to postpone pregnancy	Contraception provision
Desire to have a pregnancy	Peri- conceptional Folic acid
Symptoms suggestive of RTI/STI	Check up and treatment at PHC
Chronic medical disease	Referral to specialist as appropriate and treatment
Women reporting missed period	UPT, ANC registration

Section 3: Interventions During Pregnancy

3. Interventions During Pregnancy

3.1. Prenatal Care

3.1.1 Screening pregnant women for risk indicators for adverse neonatal outcome

Every pregnant woman should be screened for risk indicators leading to increased neonatal morbidity and mortality. Screening helps to identify pregnant women in need of extra care.

Screening can be clinical (Historic risk factors, clinical examination -BP, Height, weight) or laboratory tests like HIV, VDRL, proteinuria. Any screening can give negative results which are assuring while in some women the tests can give positive results indicating some risk to mother, baby or both.

Screen positive women need therapy, further monitoring or additional diagnostic tests. Some screening tests are recommended only once while some need to be repeated during pregnancy for which we need to know the schedule of repeating the test.

3.1.2 Antenatal Check Up Schedule

Recent WHO guidelines (2016) recommend minimum of 8 visits for being able to reduce perinatal mortality. This can be adopted for high risk pregnant women.

ANC Visits recommendation

WHO Focused ANC 2002 GOI adopted Schedule	WHO Recommendation (2016)
Visit 1 < 12 weeks	Contact 1: Up to 12 weeks

Visit 2 24-26 weeks	Contact 2: 20 weeks
	Contact 3: 26 weeks
Visit 3 32 weeks	Contact 4: 30 weeks
	Contact 5: 34 weeks
Visit 4 36-38 weeks	Contact 6: 36 weeks
	Contact 7: 38 weeks
	Contact 8: 40 weeks
Return for delivery at 41 weeks if not delivered	

3.1.3 Evaluation during antenatal checkup

At each visit some actions are indicated which are summarized below.

3.1.3.1 Basic evaluation at first visit before 12 weeks should include clinical screening to detect:

- Consumption of tobacco (smoking, chewing, *misri* use, passive smoking) and alcohol
- Age less than 19 years or > 35 years
- Heavy work schedule, inability to take adequate rest
- Historic risk indicators: Women giving past history of preterm birth/second trimester abortion, birth of LBW baby, stillbirth, congenitally malformed baby, APH, PPH, retained placenta during previous pregnancy are at greater risk of having similar problems in the current pregnancy. Such women should be referred to specialist.
- Recording Height, weight, calculating BMI in first trimester: < 18.5 or ≥ 25 Kg/ M^2
- Looking for pallor, icterus, oedema, cyanosis
- Recording blood pressure

The risk assessment for preterm / SGA babies at first visit is given below.

Risk Assessment for Preterm/SGA (LBW) baby at First Visit

Health status / issues / behaviours	
1. BMI < 18.5 kg/m^2, > 25 kg/m^2, 2. Height < 145 cm weight < 40 Kg	7. Previous H/O preterm birth, mid-trimester abortion.
3. Age less than 19 years or > 35 years	8. Anemia
4. Strenuous working, long hours of work, inability to take adequate rest	9.Urinary tract infection(UTI), Malaria, periodontal infections
5. Inter pregnancy interval < 24 months	10.Vaginal infections: Bacterial vaginosis
6. Tobacco, alcohol, illicit drug use	

Women having any of these risk indicators should be made aware of the facts and counseled for reducing the risk by dietary and other interventions. At subsequent monthly visits reinforcement counseling should be given.

Strenuous work: Encourage her to stop doing exertion, and rest for 2 hours in the afternoon in lateral position. Husband and family members to be counseled for this.

Tobacco exposure /Alcohol: Explain the adverse effects and encourage to stop completely.

BMI < 18.5 Kg/M^2(Height less than 145 cm, weight less than 40 Kg) in first trimester indicate maternal undernutrition. Undernourished pregnant women are at greater risk of delivering preterm or LBW baby. Counsel these women for nutritious diet throughout pregnancy and consumption of IFA tablets.

- Increase daily energy & protein intake to reduce LBW
- Balanced energy protein intake to reduce stillbirths, small for gestational age babies (SGA)
- They should gain more weight during pregnancy (10-12 kg as per Institute of Medicine Recommendations)
- Restrict caffeine intake to reduce the risk of pregnancy loss & LBW, if intake > 300 mg/day. A cup of instant coffee contains 60 mg, some commercially brewed coffee brands contain > 150 mg of coffee per serving. Black tea/green tea/iced tea contain < 50 mg /250 ml[1]

BMI > 25 Kg/M^2: Explain the risk and refer to specialist

Women with previous history of preterm birth should be referred to specialist in 4th month of pregnancy. Specialist can perform serial vaginal sonography every 2 weeks from 16 weeks to see if the cervix is short (< 25 mm). Specialist may consider administering weekly injections of 17 alfa hydroxy progesterone 250 mg intramuscularstarting from 16 to 21 weeks, continued until 37 weeks to women at risk of preterm birth or performing cervical OS tightening in selected cases to postpone the delivery in such women. Evidence shows that progesterone supplementation significantly reduces preterm birth in women with a history of spontaneous preterm birth. Vaginal progesterone 200 mg daily gives comparable results avoiding injections.

Other conditions: Treat UTI, correct anaemia. Improving oral hygiene is helpful.

Risk Assessment for Pre-eclampsia

High Risk	**Moderate Risk**
• Hypertension in previous pregnancy	• First pregnancy
• Chronic hypertension	• Age > 40 years
• Diabetes mellitus	• BMI > 25 Kg/m^2 at first visit
• Chronic renal disease	• Pregnancy interval > 10 years
• Autoimmune disease: Antiphospholipid syndrome /SLE	• Family history of Pre-eclampsia
• Twin gestation	

*Women having any of the condition indicating **high risk** of Pre-eclampsia should be made aware of the facts and referred to specialist for consultation regarding preventive interventions.*

High risk factors for hypothyroidism

- Obesity, H/O infertility, recurrent miscarriages
- H/O preterm births, intrauterine fetal death, Pre-eclampsia-eclampsia, placental abruption, mental retardation in previous births or in family
- Symptoms of thyroid dysfunction or presence of goitre
- H/O thyroid dysfunction or thyroid surgery prior to pregnancy, prior history of postpartum thyroiditis

Women showing any of the high-risk factors for hypothyroidism need to be referred immediately to the medical officer/specialist as they need to be screened for hypothyroidism by TSH test early in first trimester of pregnancy.

Laboratory tests

- Hemoglobin testing/ Complete blood count including platelets
- Urine dipstick for protein and sugar
- Rh, ABO testing
- VDRL, HIV, Hepatitis B
- Blood sugar (Screening for gestational diabetes mellitus post glucose)
- Solubility test : Sickle cell hemoglobinopathy
- RDT for malaria in malaria endemic areas
- Screening for hypothyroidism: TSH testing if high risk

***Imaging*:**Ultrasonography (USG) at 16-18 weeks to rule out fetal structural abnormalities

USG is also being performed between 11-14 weeks to note the gestation age of the fetus and whether it is singleton pregnancy. At this time, neural tube defects can be detected, and nuchal thickness is measured which along with other biochemical tests helps in screening for chromosomal abnormalities.

3.1.3.2 Evaluation and actions at subsequent visits include the following

- Reviewing results of screening tests performed at first visit and initiating necessary actions for screen positive women (Table 9)
- Screening for fetal structural abnormalities by USG around 16-18 weeks
- Repeating the screening tests as recommended by national guidelines
- Instituting preventive interventions
- Monitoring of blood pressure, proteinuria, fetal growth, danger signs
- Early detection of any complication and management including referral
- Education and counseling is an integral component of each contact

Table9. Review of Results of Screening Tests, Test Result Disclosure and Action*

Screening Result	**Action Recommended***
Hb <11 gm/dl	IFA 1 tab twice a day, repeat Hb after 1 month
Hb < 7 gm/dl	Line listing, Evaluation, Injectable iron, Blood transfusion as clinically indicated

HIV/VDRL negative	Assess Risk; High risk: Retest in 3rd trimester
HIV infected	Refer to ART/PPTCT centre, Triple ARV & ANC
VDRL +ve	Inj Benzathine penicillin 2.4 MU after test dose
Rh –ve (*Nonsensitized)*	Husband Rh positive? Indirect Coomb's test
Post 75gms glucose plasma glucose 140 mg% or more	Medical nutrition therapy for 2 weeks. Repeat blood sugar profile after 2 weeks
TSH > 2.5 mIU/l in first trimester or > 3 mIU/l after first trimester	Refer for Levothyroxine therapy
Solubility test positive	Confirmation by HPLC at DH, testing of husband, genetic counseling

*Please see relevant sections for details

Activities to be Performed in each ANC Visit

ANC Check up	First visit	26-28 weeks	30-32 weeks	36 weeks
Blood pressure	√	√	√	√
Weight gain in Kg/Month	√	√	√	√
Look for edema, pallor, icterus	√	√	√	√
Hemoglobin estimation	√	√	√	√
Urine analysis	√	√	√	√
Blood group, Rh type Height	√			
HIV, VDRL, Hep B tests	√		√(If high risk)	
Screening for GDM by 2 hour post 75 gm glucose	√	√ (if negative at first visit)		
Examination by medical officer	√	√	√	√
Fundal height/uterine size	√	√	√	√
Fetal heart		√	√	√
Fetal presentation		√	√	√
Referral for Danger signs	√	√	√	√
Education & counseling	√	√	√	√
Solubility test, RDT for malaria, TSH, Hepatitis B(if available)	√			

Second visit 18-20 weeks

- Repeat Hemoglobin estimation, Urine analysis
- Monitor blood pressure. Note increase in weight from previous visit. Calculate in Kg/month. Note fundal height
- Review USG report for fetal structural defects, number of fetuses, placental location. Fetal cardiac defects are better detected at this time. However, considering the legal limit of 20 weeks for MTP, 24 weeks under gynecologist opinion required the detection and further action for major structural anomalies need to be expedited.

Third visit 26-28 weeks

- Complete physical examination by medical officer. Auscultate chest.
- Monitor blood pressure. Calculate weight gain from previous visit in Kg/month.
- On the day of visit, calculate the duration of pregnancy in weeks + days and measure the fundal height and check whether it is corresponding with the period of amenorrhea. Measuring fundal height in cm gives better idea about fetal growth. Height in cm usually corresponds with gestational period in weeks. A lag of > 2 week needs evaluation by specialist to detect fetal growth restriction.
- Repeat Hemoglobin estimation, Urine analysis.
- Repeat screening for GDM if negative at first visit.

Fourth visit: 30-32 weeks:

- Monitor blood pressure. Calculate weight gain from previous visit in Kg/month.
- Screen for IUGR. If IUGR suspected, refer to specialist for evaluation.
- Repeat Hemoglobin estimation, Urine analysis.

Fifth visit: 36 weeks

- Monitor blood pressure. Calculate weight gain from previous visit in Kg/month
- Check fetal presentation, fetal heart rate, look for fetal growth restriction. Refer if breech, overdistended uterus, suspected IUGR
- Repeat Hemoglobin, Urine routine

3.1.3.3 Medications

- Give folic acid during first trimester
- Start prophylactic or therapeutic IFA tablets after 12 weeks as per hemoglobin level and continue till delivery
- Give tab Albendazole single dose during second trimester do not take together with IFA and take after several hours apart
- Give calcium one tablet twice a day from second trimester till delivery
- Inj Td 2 doses or booster dose as per history
- Offer Influenza vaccine during influenza season

3.1.3.4 Education and Counseling

- Nutrition guidance, rest and exercise, healthy lifestyle
- Visit schedule and procedures to be carried out during each visit
- Identification of birth companion and making birth plan, birth preparedness, institutional delivery, place of delivery.
- Breast feeding: Early initiation, exclusive breast feeding, early skin to skin contact (KMC)
- Contraception including PPIUCD
- Importance of MCP card
- Prompt reporting for danger signs

3.2 Screening for Nutritional Anaemia, Prevention and Correction

3.2.1 Introduction

Anaemia in pregnant women is haemoglobin level of < 11 g/dl. Nutritional deficiency is the commonest cause of anaemia. Anaemia contributes to 20 % of maternal deaths. Around 45% of pregnant women are anaemic (NFHS 5). National anaemia reduction targets for 2022 are (at the rate of 3 percentage points per annum from baseline) to reduce the prevalence among pregnant women to 32% and among lactating women to 40%

3.2.2 Effects of Anaemia on Mother and Baby

Maternal	Baby
Increased risk of cardiac failure, PROM, premature early seperation of placenta (APH)	Fetal growth restriction (IUGR)
Inability to withstand third stage hemorrhage, can go in shock with moderate blood loss	Prematurity
During Puerperium: Risk of puerperal sepsis, Poor establishment of lactation, Puerperal venous thrombosis, Pulmonary embolism	Poor stores of iron at birth, risk of anemia during infancy

3.2.3 Screening test and interpretation

Hemoglobin is tested by Sahle's method at first visit. It is repeated during visit at 24-26 weeks, 32 weeks and at 36 weeks. The recent GOI guidelines recommend Hb estimation by invasive digital hemoglobinometer at all ANC contact points. At all high case load facilities at block level and above Hb testing by using semi auto analyzers is recommended. (Refer to the AnaemiaMukt Bharat operational guidelines)

Degree of anaemia:

- Mild: Hb 10 to 10.9 gm/dl
- Moderate: Hb 7 to 9.9 gm/dl
- Severe: Hb < 7 gm/dl

Even when Hb% is normal, the iron stores in the body can be depleted and there can be a state of iron deficiency which needs to be corrected by giving prophylactic IFA tablets.

3.2.4 Intervention

3.2.4.1 Hb ≥ 11 G/dl. Give Prophylaxis: Give one IFA tablet (Elemental iron 60mg with folic acid (FA) 0.5mg/day sugar coated red color) daily orally for 180 days during pregnancy after first trimester, to be continued after delivery for 6 months. Tablets to be taken 2 hours after meals. Iron and calcium tablets should not be taken together. Tea should not be taken with iron tablets. Citrus fruits/juice helps iron absorption. Nutritional guidance is important for any degree of anaemia. Counsel for extra intake of protein, iron and multivitamins.

Deworming medicine helps in preventing anaemia. Give one tablet Albendazole (400mg) single dose during second trimester.

3.2.4.2 Mild/Moderate anaemia: (Hb 7.0 to 10.9 G/dl): Give therapeutic double dose: Give oral IFA two tablets daily. Check response after 4 weeks. Follow up every 2 months by HCW for compliance of treatment during the contact. The treatment should be continued till the Hb becomes 11 gm/dl, then continue one tablet daily till delivery. If no improvement after 2 months of treatment (< 1gm/dl increase) refer to PHC/FRU/DH for investigations and parenteral iron treatment. (IV iron sucrose)

3.2.4.3 Severe anaemia:

Hb 5.0 to 6.9 G/dl:Refer such woman to PHC/RH/SDH/DH for treatment by parenteral iron.

If severe anaemia is detected during third trimester of pregnancy refer to specialist for complete evaluation and management. Hospitalization helps in investigating cause of anaemia.

Intravenous iron sucrose therapy is indicated if there is intolerance, noncompliance or non-response to oral iron. IV iron can also be considered for women detected to be anemic late in pregnancy or in whom compliance is likely to be low (high chance of lost to follow up). IV Iron sucrose is safe. It helps in replenishing iron stores faster than oral iron.

General comments:

- IV iron sucrose is category B drug which is safe during pregnancy.
- Oral iron should be discontinued 24 hours prior to IV iron sucrose injection
- Women having anaemia due to hemoglobinopathy should not be given IV iron injections. Treatment with folic acid is recommended.
- The dose calculation by formula: 2.4 x pre-pregnancy weight in Kg x (Hb deficit in gm/dl) + 500 mg for stores rounded up to the nearest 100 mg.
- This generally yield 800-900 mg for an average pregnant woman weighing 45 kg with a Hb deficit of 3-4 gm/dl. To remove the complex calculations for dosage, a standard total dose of 800 mg (4 injections of 200 mg) can be administered to pregnant women requiring parenteral iron.
- Each injection can be 200 mg diluted in 100 ml of normal saline administered over 15 to 20 minutes under supervision of medical officer. (Slow infusion can be harmful)
- Emergency medicine tray must be ready near the patient
- All anaemic women need to be counseled for increasing dietary intake of proteins, vitamins and iron.
- Repeat Hb after one month. If no improvement is observed in hemoglobin (<1 gm/dl increase), refer the woman to higher centre.

Hb < 5 Gm/dl: Pregnant women having Hb < 5 gm /dl at any period of pregnancy must be hospitalized immediately in a centre where round the clock specialist care is available. They need to be administered packed red cell transfusions (PRBC) under medical supervision.

PRBC transfusion: The following pregnant women must be hospitalized in district hospital andadministered PRBC transfusions under medical supervision.

- Hb < 5 gm any time during pregnancy
- Hb 5-7 gm/dl with impending signs of cardiac failure

- Severe anaemia seen after 34 weeks of pregnancy
- Women presenting during labour with Hb <7gm/dl
- Severe anaemia not due to nutritional deficiency (Hemoglobinopathy, hemolysis). Consult hematologist for treating such women

Packed red cells are transfused slowly and under supervision.

One unit is expected to raise Hb by about 1 gm/dl. Second unit can be given on 3rd or 4th day of first PRBC transfusion. Depending on repeat Hb level decision of 3rd PRBC transfusion may be taken by the specialist.

PRBC transfusion is for immediately increasing the oxygen carrying capacity. Cause of anaemia needs to be investigated and treated simultaneously for lasting effect.

3.2.4.4 Points to Remember: Correcting anaemia early in pregnancy helps in fetal growth,reduces the maternal morbidity due to hemorrhage and sepsis. This will help in reducing maternal and neonatal mortality.

3.2.5 Role of health personnel: ASHA/ANM should mobilize every pregnant woman and counsel her for hemoglobin testing and repeat it as recommended at 4 scheduled visits. Dietary counseling, distribution of IFA tablets and calcium tablets and checking compliance is important.

ANM: Perform hemoglobin as recommended. Line list severe anaemia cases and refer them for parenteral iron therapy as recommended.

PHC/RH: Arrange to provide care to referred anaemic women (Inj. IV iron sucrose, investigations). Follow the women through delivery and ensure the appropriate postnatal care.

CEmONCcentre: Provision of Inj. IV iron sucrose, special investigations, delivery of very severely anaemic women, packed red blood cells transfusions as required. Treat complicated cases.

3.3. Preventing Pre-eclampsia

3.3.1 Background

Hypertensive disorders during pregnancy are responsible for about 14% of maternal deaths in India. Severe Pre-eclampsia and eclampsia is the second major cause of maternal deaths due to cerebral hemorrhage, renal failure, aspiration pneumonia, pulmonary oedema, HELLPsyndrome (haemolysis, elevated liver enzymes, low platelet count), liver failure and coagulation failure. Perinatal mortality(PNM) is high due to preterm births, fetal growth restriction, fetal and neonatal asphyxia.

3.3.2 Calcium Supplementation

The incidence of hypertension during pregnancy is found to be higher in women having low calcium intake in their diet. Many studies have shown that calcium supplementation during pregnancy reduced the risk of Pre-eclampsia by 31-67% and gestational hypertension by 30% in calcium deficient women. There is also reduction in preterm, LBW babies and PNM.

3.3.2.1 Intervention

Pregnant women should be counseled to increase the dietary intake of calcium and consume calcium tablets to reduce the occurrence of hypertension.

- Calcium carbonate tablets containing 500 mg of elemental calcium and 250 IU of vitamin D3 twice a day with meals from second trimester of pregnancy until delivery. Drink plenty of fluids. Continue the tablets for 6 months after delivery.
- Calcium and iron supplements should not be taken at one time. They should be taken several hours apart.
- Regular BP monitoring is necessary for early detection of Pre-eclampsia.

3.3.2.2 Role of health personnel: ASHA/ANM should mobilize every pregnant woman and counsel her for calcium rich diet, distribute calcium tablets and check compliance**.**

3.3.3 Preventing Pre-eclampsia with Low Dose Aspirin:

Before the onset of hypertension and proteinuria many changes take place in uteroplacental circulation. Abnormal placentation, vascular endothelial dysfunction, platelet activation and aggregation, decrease in the vasodilatory prostaglandins precede the development of hypertension. These changes are taking place early in second trimester. Aspirin has an anti-prostaglandin action and helps to restore ratio of vasodilatory to vasoconstricting prostaglandins.

3.3.3.1 Current evidence suggests that low dose aspirin 75 mg daily from 12 weeks till 36 weeks for prevention of Pre-eclampsia benefits in women who are at higher risk of developing hypertension during pregnancy such as:

- Pre-eclampsia in previous pregnancy
- Twin pregnancy
- Diabetes mellitus
- Chronic hypertension, Chronic renal disease,
- Autoimmune disease: Antiphospholipid syndrome /SLE

The effect is better when aspirin is started by 16 weeks.

At first antenatal visit, the ANM/MO should check whether the woman is at high risk of developing Pre-eclampsia and refer women at high risk of Pre-eclampsia to specialist. Regular checking for BP / proteinuria is still necessary during pregnancy.

3.4 Preventing Neonatal Tetanus and adult diphtheria

Immunization of every pregnant woman during pregnancy using Tetanus Toxoid and Adult diphtheria vaccine (Td) effectively eliminates neonatal tetanus and protects the pregnant woman against tetanus and adult diphtheria.

Intervention

InjectionTd is administered intramuscularly to every pregnant woman, first dose at first antenatal visit and second dose after 4 weeks. Women who have received two doses in first pregnancy which was within three years, can receive only one booster dose.

3.5. Preventing Influenza during Pregnancy by Inactivated Vaccine

Pregnant women are at higher risk of getting severe complications if they acquire H1N1 influenza infection during pregnancy. The risk is more during third trimester of pregnancy.

The morbidity and mortality are high during pregnancy. Pregnant women with flu can have higher rates of stillbirth, spontaneous abortion, and preterm birth.

3.5.2 Intervention

Routine influenza vaccination by inactivated vaccine is recommended for all women who are pregnant (in any trimester) during influenza season.

Do not give live attenuated influenza vaccine (LAIV) to pregnant women.

Avoiding direct contact with someone who is having flu like symptoms should be advised.

Report any fever promptly. Early treatment of the illness provides greater benefit. Oral oseltamivir 75 mg daily for 5 days to be started within 48 hours of onset of illness of suspected influenza.

3.6 Syphilis Screening & Case Management During Pregnancy

3.6.1 Introduction and effect on pregnancy

Syphilis is a sexually transmitted bacterial infection. If pregnant woman is infected by syphilis, the infection can be transmitted to her unborn fetus. Effects on pregnancy include late abortions, stillbirths, neonatal deaths, infant having active congenital syphilis.

3.6.2 Screening test

At PHC, perform RPR/VDRL test on blood sample of every pregnant woman at first visit. Retest high risk pregnant women during third trimester or at labour. Any woman who has delivered a stillborn baby should be tested for syphilis.

VDRL test nonreactive: No further action. Perform risk assessment for STI. If high risk, VDRL negative women should be retested during third trimester
VDRL reactive: Note the titers. Positive test in any dilution should be treated by antibiotics. During pregnancy, biological false positive test is possible hence positive results should be confirmed by TPHA test where possible (NACO). Repeat the titre at delivery and assess the infant.

3.6.3 Intervention at PHC/RH

Treatment of maternal infection can prevent and treat established fetal disease/infection

- Penicillin is the only antibiotic that can cross the placenta in adequate amounts to treat the fetus. Penicillin is more effective in treating fetal infection.
- Benzathine penicillin single injection 2.4 million IU IM after sensitivity test. **Give this injection in ward setting with all emergency drugs kept ready for managing allergic reaction.**
- Long standing infection (>1-year duration): 3 injections at weekly interval are recommended. Even one injection helps in preventing fetal infection in these cases.
- Erythromycin ethyl succinate 500 mg 4 times a day for 15 days for women who are allergic to penicillin. For late syphilis erythromycin is recommended for 30 days.
  Note (Erythromycin estolate is contraindicated during pregnancy.)
- Alternatively, Azithromycin 2 gm can be given orally as a single dose
- Attempts should be made to complete the treatment early during pregnancy
- Treating the mother adequately with Benzathine penicillin at least 4 weeks prior to delivery reduces the risk of transmission to baby
- Treatment of partner and safe sex counseling is important to avoid re- infection

- Infant of a VDRL positive mother needs care by specialist. Blood sample is tested for VDRL. (Cord blood may give false positive result). Titre 4 times greater than the mother suggests that infant has congenital syphilis.
- All infants born to seropositive mothers need treatment, prophylactic Inj Benzathine penicillin G 50000 units/Kg IM single dose or therapeutic as recommended for 10 days.

3.6.4 Point to Remember

For eliminating congenital syphilis, VDRL test should be done on every pregnant woman at first clinic visit. Early treatment of syphilis during pregnancy prevents infection of the fetus.

3.6.5 Role of health personnel

ASHA/ANM should counsel pregnant women for having syphilis test at first visit.

MO at PHC/RH: Performing VDRL test early in pregnancy on every pregnant woman. Treatment of VDRL positive pregnant women as per guidelines. Deliver these women at PHC. Treat the newborn baby in consultation with child specialist.

Specialist at DH/ CEmONC: Treatment of VDRL positive pregnant women referred. Care of newborn baby and follow up of infant.

3.7. Prevention of parent to child transmission of HIV (PPTCT)

3.7.1 Introduction

As per India HIV estimations 2017, adult HIV prevalence in Maharashtra is 0.33%. ANC sentinel surveillance for 2016-17 reported the prevalence in pregnant women as 0.26%. Transmission of HIV infection from HIV infected pregnant woman to her baby is about 30% in the absence of any intervention. Instituting proven interventions during pregnancy, labor and postpartum period coupled with special care to the baby can reduce the risk substantially.

3.7.2 Screening Test

Offer HIV counseling and voluntary HIV testing to every pregnant woman during her first antenatal visit with an opt out option.

Perform screening test on finger prick whole blood sample.

Test negative: Negative test result can be disclosed immediately along with counseling to stay negative. Perform risk assessment. Encourage high risk pregnant woman to have repeat test during third trimester.

Test positive. Refer the pregnant woman early to nearest ICTC for test result confirmation. The confirmed positive test result is disclosed by a professional HIV counselor. Encourage the woman to get her spouse tested.

3.7.3 Intervention

- If pregnancy is unwanted and is < 20 weeks refer the woman to MTP centre. If she wishes to continue pregnancy, refer her early to PPTCT centre.
- Explain the benefits of nutritious diet and micronutrient in reducing the risk of vertical transmission.
- Explain importance of safe sex practices for preventing new STIs and other strains of HIV which could harm the baby.
- Encourage regular follow up at ART and PPTCT centers and adherence to HIV medicines.
- Encourage institutional delivery. Explain the benefits of early reporting to the hospital at the onset of labour.

- Explain safe infant feeding practices, infant care, and protocol for early infant diagnosis.
- Explore stigma and discrimination experienced and offer support.
- Screen for TB and STI at every visit. Ask history of any abnormal vaginal discharge, genital lesions,persistent cough, fever etc.

3.7.3.1 Maternal Antiretroviral therapy:

The baseline investigations of Hb, urine, VDRL, screening for hepatitis B and C, ALT, CD4, urea/creatinine, blood sugar, lipid profile are performed. Prior history of receipt of Efavirenze or Nevirapine is noted. Clinical staging is done. Irrespective of CD4 count, lifelong ART by triple antiretroviral medicines is initiated immediately without waiting for test results. If there is no prior exposure to Efavirenz /Nevirapine; preferred regime of once daily fixed dose combination of Tenofovir, Lamivudine and Efavirenz (EFV) tablet is started from 14 weeks onwards to be continued throughout pregnancy, labour and after delivery.[2] If there is H/O prior exposure to Nevirapine/EFV then EFV is replaced by two tablets of protease inhibitor (Lopinavir 200 mg/Ritonavir 50 mg) twice a day. (Table 10).Laboratory tests are repeated as per protocol.

Table 10. Dosage Schedule and Associated Side Effects of ARV Medicines

Name of ARV	Dose	Major Side Effects
Tenofovir (TDF)	300 mg OD	Nephrotoxicity, hypophosphatemia
Lamivudine (3 TC)	300mg OD	Very few, Hypersensitivity, rarely pancreatitis
Efavirenz (EFV)	600 mg OD	Hallucinations, suicidal ideation, nightmare
Lopinavir/Ritonavir (LPV/r)	400/100 mg BD	GI disturbance, glucoseintolerance, lipo-dystrophy&hyperlipidemia

If CD4 is < 250 cotrimoxazole (CTZ) 1 double strength (DS) tab is given daily

3.7.3.2 Care during delivery:

Insist on institutional delivery at a PPTCT centre as she requires ARV medicines during labor.

If she is in advanced labor and is likely to deliver soon conduct her delivery by following principles:

- Give ARV medicines during labour as per protocol
- Minimize vaginal examinations and use aseptic techniques.
- Do not rupture membranes artificially unless indicated.
- Avoid giving routine episiotomy.
- Avoid instrumental delivery as much as possible. If indicated low forceps/outlet delivery is preferable to vacuum delivery.
- Follow universal safety precautions during conduct of delivery.
- Avoid suctioning the newborn with nasogastric tube unless indicated.
- Clean the baby of the maternal blood and body fluids before handing over to the relatives.

- Caesarean section is to be done only for obstetric indications and not for prevention of mother to child transmission.

Screening in Labour room: On arrival to labour room, check the HIV serostatus of every pregnant woman and details of ART drugs during pregnancy. If her HIV status is unknown and she is in first stage of labour, offer HIV counseling and testing using whole blood finger prick testing. If the test is positive, explain the woman that the test will need to be repeated after delivery for confirmation of status. She should be administered the first dose of ART and advised for confirmation of tests through ICTC counselor and lab technician the following day (NACO 2013). Refer all HIV positive women to ART center.

3.7.3.3 Care of mother after delivery:

- ContinueART lifelong irrespective of the choice of infant feeding.Counsel for adherence to ART medicines.
- Counsel for nutritious diet and nutrient supplements.
- Watch for signs of sepsis.
- Screening for postpartum depression should be done before discharge and during postpartum follow up visits as there is increased risk.
- Encourage to use reliable contraception and continue safe sex practices. Encourage consistent use of condom in addition to other methods of contraception.IUCD (Cu 380 A) can be used by these women (PPIUCD as well as at other indicated time). Injectable contraception (DMPA) is safe.
- Counsel for annual screening for cervical cancer in view of higher risk of associated HPV infection.

3.7.3.4 Care of HIV exposed infant:

Prophylactic ARV: Infant is given Nevirapine (prophylaxis) for 6 weeks irrespective of choice of infant feeding. May be considered for 12 weeks if mother has received ART medicines for <24 weeks (Table 8). Nevirapine should be started immediately after birth.

Table 11. Dose and Duration of Infant Nevirapine Prophylaxis

Birth Weight	Dose (mg)	Dose (in ml)	Duration
> 2500 gm	15 mg once daily	1.5 ml once a day *	Upto 6 weeks irrespective of exclusively breast fed or exclusive Replacement fed**
2000 to 2500 gm	10 mg once daily	1 ml once a day	
< 2000 gm	2 mg/kg once daily in consultation with expert pediatrician	0.2 ml/kg once daily	

*Considering content of 10 mg Nevirapine in 1 ml suspension

**May be extended to 12 weeks if mother has not received ART for at least24 weeks

Appropriate infant feeding is initiated as shown below:

1. Exclusive breastfeeding is the recommended infant feeding choice in the first 6 months, irrespective of the fact that mother is on ART or infant is provided with ARV prophylaxis for 6 weeks.
2. **Mixed feeding (breast-feeds and replacement feeds in the first 6 months) should not be done at any cost within the first 6 months** as it increases the risk of HIV transmission.
3. In situations where breastfeeding cannot be done or on individual parents' informed decision, replacement feeding may be considered only if it is affordable, feasible, acceptable, safe and sustainable (AFASS).
4. Exclusive breastfeeding should be done for at least 6 months, after which complementary feeding should be introduced gradually, irrespective of whether the infant is diagnosed HIV negative or positive by early infant diagnosis (EID).
5. Beyond 6 months, if breast feeding option has been chosen, breast feeding is continued as per (EID) status
    - Infants diagnosed as EID negative, breastfeeding should be continued until 12 months of age ensuring the mother is receiving ART. Stopping breast feeding should be done gradually within one month.
    - For breast feeding infants who are diagnosed HIV positive, ART should be started, and breastfeeding should be continued till the baby is two years old.

- *At 6 weeks: Cotrimoxazole (CTZ) prophylaxis* is started which is continued till the baby is 18 months old. It is continued further if baby is HIV positive.
- *Early infant diagnosis(EID) of HIV status:*
    - At 6 weeks, Baby is tested by DNA PCR test on dry blood spot (DBS); if DBS test is +ve, confirmatory PCR testing is done on whole blood spot (WBS). For positive babies ART is started at pediatric ART center irrespective of CD4.
    - EID negative infants are tested again at 6 months and 12 months and 6 weeks after complete stoppage of breast feeding.
      If the baby is more than 6 months,rapid HIV antibody test is done first. If it is positive then only DBSsample is tested. If DBS is positive then WBS is tested by DNA PCR. If WBS test is positive, ART is initiated in pediatric ART centre.
    - At 18 Months: Confirmation of HIV status should be done at 18 months using 3 rapid tests for all babies irrespective of the earlier EID status. No DNA PCR at 18 months.
- *Further care*: Growth & nutrition monitoring, immunization as per schedule.

3.7.4 Points to Remember

- Detecting HIV infection in pregnant woman during her first visit in first trimester gives opportunity to start triple antiretroviral medicines early which significantly reduces the risk of transmission to her baby.
- Timely referral to ART centre and PPTCT centre can help preventing vertical transmission of HIV. All HIV infected pregnant women should have PPTCT interventions provided early in pregnancy as far as possible.
- The infant is given prophylactic ARV, is followed carefully and the diagnosis of HIV status is confirmed.

3.7.5 Role of health personnel

ANM should counsel every pregnant woman for HIV testing and perform rapid HIV test on whole blood finger prick sample at first antenatal visit. Disclose the negative test result. Refer

women with suspicious test results to ICTC for confirmation. Follow up of PPTCT center clients.

PHC/RH: Referral of confirmed HIV infected women to ART centre and PPTCT centre for enrollment and ART medicines. Follow the women through delivery and ensure the appropriate infant care. Deliver uncomplicated cases when required. Refer to national guidelines for PPTCT of HIV for details (NACO)

ART/PPTCT centre: Provision of ART, safe delivery care, care of exposed infant including early infant diagnosis and care.

3.8 Screening for Rh Factor: Preventing Rh Isoimmunization

3.8.1 Introduction

About 4-5% pregnant women attending ANC are likely to be Rh negative. If the Rh-negative woman has married to a Rh-positive man their child is more likely to be Rh positive. When Rh negative mother bears Rh positive fetus, the Rh antigen from fetal red cells enters the maternal circulation and gives rise to antibody formation in mother. These antibodies cross the placenta and cause destruction of fetal red cells resulting in fetal anaemia. Rh blood group incompatibility between the mother and her fetus is a major cause of hemolytic disease of newborn. Prevention of such sensitization is possible by antenatal screening and appropriate care.

Pregnancy outcome: First child usually escapes. Subsequent babies suffer from rapidly increasing jaundice within 24 hours of birth or hydrops fetalis resulting in fetal death. In subsequent pregnancy, the fetal complications occur at an earlier period during pregnancy.

3.8.2 Screening test

Test blood of every pregnant woman for blood group and Rh typing at first clinic visit

- *Test result Rh positive:* No specific action. Inform the blood group to her.
- *Test result Rh negative*: Get her husband's Rh typing done. If husband is also Rh negative, explain the couple that no further action is needed.
- *Pregnant woman Rh negative and her husband positive:* Explain the need for further evaluation to her.

➢ Ask history about outcome of every pregnancy. H/O neonatal jaundice, hydrops, stillbirths
➢ Note H/O receiving anti D immunoglobulin, time, dose during/following every pregnancy
➢ Perform indirect Coomb's test (ICT) on woman's blood sample to detect presence of antibodies in the maternal blood

3.8.3 Intervention

3.8.3.1 ICT Negative: Woman does not have detectable antibodies against Rh antigens. ICT is repeated monthly from 28 weeks.

- External cephalic version is not performed for fetal malpresentation.
- After any episode of bleeding or procedure (e.g amniocentesis) anti D immunoglobulin is administered. (300 micrograms IM)
- At delivery, obtain cord blood sample and send for following tests:
    - Infant's Rh type is tested. If infant is Rh negative, no further action.
- Infant Rh positive: ABO grouping, hemoglobin and hematocrit is done as baseline, Direct Coomb's test, Direct and indirect bilirubin estimation

- If the baby is Rh positive, administer 300 mcg of anti D IM to mother as early as possible within 72 hours of delivery
- Refer the baby to neonatology specialist and observe it for icterus, anaemia

3.8.3.2 ICT Positive: The woman has got antibodies against Rh antigen in her blood. Note the titers. Do not give Anti D to sensitized mother.

- **Refer her to a tertiary care centre** having fetal medicine expert. Equipment and expertise for fetal blood sample testing by cordocentesis and intravascular fetal transfusion is needed for management.
- Degree of fetal affection needs to be assessed by doppler Middle Cerebral Artery Peak Systolic flow Velocity studies (MCAPSV). Serial USG is done to look for early signs of hydrops fetalis.
- Severe affection indicates the need for early delivery of a salvageable fetus.
- For extremely preterm fetus, intrauterine transfusions with O Rh negative fresh packed red cells transfusion are carried out to raise the hematocrit.
- Early delivery is planned
- Baby needs close monitoring, repeated testing for hemoglobin and bilirubin levels.
- Treatment includes phototherapy and exchange transfusion depending upon severity of hyperbilirubinemia.
- Increasing jaundice, rapidly rising unconjugated bilirubin, declining Hb indicate deterioration. There is risk of Kernicteus which can lead to permanent disability or even death of the neonate.

3.8.4 Point to remember

Screening of every pregnant woman for Rh type of her blood, testing husband of Rh negative pregnant woman to find possibility of Rh incompatibility between the mother and her fetus and preventing sensitization by administration of anti D injection at all indicated time(e.g.following abortion) is important.

3.8.5 Role of health personnel

ASHA/ANM should mobilize and counsel every pregnant woman for blood group testing at first visit and follow Rh negative pregnant women.

PHC/RH: Arranging blood group testing and Rh typing of every pregnant woman. The spouse of Rh negative woman should be tested. Arrange to get Indirect coomb's test on blood sample of pregnant woman having her husband Rh positive.

Conduct delivery of non-sensitized pregnant woman at PHC. Find whether the baby is Rh positive and administer anti D immunoglobulin as per guideline.

Referral of sensitized cases to specialist,

CEmONC: Arrange care for sensitized women and their babies by experts

3.9 Screening and Management of Diabetes Mellitus in Pregnancy

3.9.1 Introduction

Diabetes mellitus (DM) detected for the first time during pregnancy is called as Gestational Diabetes Mellitus (GDM). DM diagnosed before pregnancy is pregestational DM. Hyperglycemia associated with pregnancy results in higher maternal and perinatal morbidity

and requires meticulous control of blood sugar levels and special care. Of all GDM patients, more than 50% develop type 2 DM in later life.

Effects of GDM on Mother & Baby

Risks to Mother	Risks to Baby
Increased risk of Pre-eclampsia, Polyhydramnios	Unexplained sudden fetal death during third trimester leading to stillbirth. Congenital abnormalities
Prolonged labour due to fetal macrosomia. Maternal injuries during birth of large baby. Increased chances of caesarian section.	Macrosomia (big baby > 4 Kg) leading to birth trauma (due to shoulder dystocia), birth asphyxia and intrapartum fetal death
Increased risk of chorioamnionitis and postpartum endometritis	Neonatal hypoglycemia, Hypocalcemia, Respiratory distress syndrome
Recurrent urinary tract infections, fungal vaginitis, skin infections	Prematurity, Jaundice, Apnea and Bradycardia, Polycythemia

The risk of fetal anomalies is high in pregestational DM. It is not increased in GDM patients.

3.9.2 Screening and diagnosis of diabetes in pregnancy

All Indian women belong to high risk group and should be screened for GDM at the first antenatal visit as early as possible. One step screening and diagnostic test should be done, and the result is given to the woman during the same visit. Glucometer must be available at all ANC clinics for detecting women having GDM and in the labour room for close monitoring of GDM cases during labour. Calibration of Glucometer is recommended after 20 measurements using calibration test strips, provided with glucometers.

Screening Procedure:When the pregnant woman comes to antenatal clinic, irrespective of her meal status, give her 75gm glucose orally after dissolving in approximately 300 ml water. Tell her to drink it within 5 -10 minutes. If vomiting occurs within 30 min of oral glucose intake, repeat the test next day. If vomiting occurs after 30 minutes, continue the test. Evaluate the blood glucose 2 hours after the oral glucose load by a plasma standardized glucometer.

3.9.3 Interpretation and Action

- A value of ≥ 140 mg/dl is considered diagnostic of GDM.
- If the first test is negative, repeat the test during 24-28 weeks

Positive test result at any visit(plasma glucose ≥140 mg/dl): Start Medical Nutrition Therapy (MNT) and advise regarding physical exercise.

After 2 weeks on MNT and physical exercise, perform 2 hrs PPPG (postprandial plasma glucose).

If 2 hr PPPG <120 mg/dl, assure the woman and follow her by frequent repeat blood test at least once a month during second and third trimester.

If 2 hr PPPG ≥120mg/dL, explain the woman that she needs to start medical management. (Oral metformin or Inj insulin)

Referral:If MNT fails to control blood sugar, or if there is any complication refer her

to specialist at FRU.A team of diabetologist, sonologist and neonatologist should manage the case in consultation.

3.9.4 Controlling hyperglycemia: Goals for control

- Fasting whole blood glucose should be < 95 mg/dl
- 2 hour post meal blood glucose should be < 120 mg/dl

3.9.4.1 Medical Nutrition Therapy & Physical Exercise: Energy requirement increases during second and third trimester. Energy intake should be adequate to provide appropriate weight gain during pregnancy. Severe caloric restriction is not recommended as it may result in ketonemia and ketonuria and impair physical and mental development of baby.

Calculate calories for 24 hours according to BMI and activity level. For simplicity at field level the following GOI recommendation can be followed (Table 12).

Table 12: Level of Activity and energy requirement during pregnancy

Level of Activity	Energy requirement during pregnancy (kcal/day)	Total energy requirement (kcal/day)
Sedentary work	1900+350	2250
Moderate work	2230+350	2580
Heavy work	2850+350	3200

Depending upon the weight category the final requirement is calculated by deduction or addition of 500 calories per day (Table 13).

Table 13: Energy requirement during pregnancy based on BMI

Weight category	BMI (Kg/m^2)	Daily Energy Requirement
Underweight	< 18.5	Energy requirement as per level of activity+500 kcal/day
Normal weight	18.5 to 22.9	Energy requirement as per level of activity
Overweight	23 to 24.9	Energy requirement as per level of activity
Obese	>25	Energy requirement as per level of activity-500 kcal/day

- Composition of diet– It should include carbohydrates (50-60%), proteins (10-20%) and fats (25-30%) with saturated fat <10%. Plan a diet with the help of nutritionist.
- Instruct her to take three major meals and 3 snacks
- Exercise**:** Walking for 30 minutes a day

Principles of MNT: Large amounts of carbohydrate foods eaten at one time will lead to high blood glucose level and should be avoided. It is better to spread carbohydrate foods over 3 small meals and 2–3 snacks each day than taking 3 large meals.

Complex carbohydrates (like whole-grain cereals like oats, bajra, jowar, ragi, whole pulses, vegetables and fruits with skins) should be preferred over simple carbohydrates like food with lots of added sugar or honey, or foods that are made from refined white flour.

Simple carbohydrates like sweets, cakes, puddings, sweet biscuits, pastry, juice, soft drinks, chips, white bread, naan, pizza etc. should be avoided.

The aim should be for 2–3 carbohydrate serves at each major meal and 1–2 carbohydrate serves at each snack. (One serve= approximately 15 grams i.e.3 tea spoons full).

Protein: Protein requirement is increased during pregnancy. At least 3 serving of protein foods are required every day to meet this demand. Sources of protein are milk and milk products, egg, fish, chicken, pulses (dal), nuts etc.

Fats: She should use less fat in cooking and avoid frying of foods. Reduce intake of ghee, butter, oil, full cream milk. Avoid high-fat snacks (cakes, biscuits, chocolates and pastries). Use low-fat dairy products in place of whole milk. Using lean meat in place of red meat. Saturated fat intake should be less than 10 % of total calories.

Fiber: High fibre foods especially soluble fibre may help control blood sugar. Soluble fibre in flax seed, psyllium husk, oat bran, legumes (dried beans of all kinds, peas and lentils), and pectin (from fruit, such as apples) and root vegetables (such as carrots) are helpful.

After 2 weeks of MNT,2-hour postprandial blood sugar should be tested. If it is < 120 mg/dl, continue MNT and physical exercise. Monitor PPG as suggested by physician, at least once a month.

3.9.4.2 Medical management (Oral antidiabetic - Metformin and Insulin Therapy)

If MNT fails to achieve 2 hr PPG <120 mg/dLwithin two weeks of therapy, **Metformin or insulin is the accepted management of pregnant women with GDM**

- Insulin can be started anytime during pregnancy.
- *Metformin* can be considered after 20 weeks of gestation. Dose 500 mg twice daily. BSL to be repeated biweekly, dose is increased as required maximum up to 2 gm/day.
- Hypoglycemia and weight gain are less with Metformin than with insulin.
- If insulin is required in high doses, Metformin can be added to the treatment.
- Common side effects of metformin: Diarrohea, nausea, stomach pain, heartburn, gas
- Serious effects: Lactic acidosis, hypoglycemia

Administering Insulin:

- Inj Human Premix Insulin 30/70 to be administered
- Insulin syringe: 40 IU syringe to be used
- Insulin Vial: 40 IU/ml to be used
- Insulin pen includes an insulin cartridge, dial to measure dose and a disposable needle
- Open vials in current use: Store in refrigerator at 4-8^0 C or in cool dark place
- Inj to be given subcutaneously 30 minutes before breakfast, once a day.
- Site of injection: Front or lateral aspect of thigh or over abdomen
- Dose to be calculated as per blood glucose level. The recommended starting dose:
    - BSL 120-160 mg/dl: 4 IU
    - BSL 160-200 mg/dl: 6 IU
    - BSL > 200 mg/dl: 8 IU
- Fasting and 2-hour PP BSL to be done every third day
- Goal: Fasting < 95 mg/dl; 2-hour PP < 120 mg/dl
- Increase the dose as per fasting and PP sugar levels.

- Early recognition of hypoglycaemia and prompt treatment is important. Ask the woman to keep glucose powder or sugar with her

Referral to higher centre:

- Fasting BSL > 150 mg/dl and post meal > 250 mg/dl even after giving metformin or insulin
- If pregnant woman requires > 20 units insulin/day or metformin > 2 gms/day, she should be referred to higher centre
- Nausea, vomiting and not able to take food orally
- Symptoms of hypoglycemia more than once in a day

3.9.5 Antenatal care

For GDM cases antenatal care should be provided by gynecologist.

USG should be done at 18-20 weeks for excluding fetal malformations. USG should be repeated at 28-30 weeks and at 34-36 weeks gestation for assessing fetal growth and amniotic fluid index (AFI).

Monitor the weight gain during pregnancy.

At each ANC visit look for macrosomia or fetal growth restriction, polyhydramnios, hypertension, proteinuria and other obstetric complications.

If the blood glucose level is uncontrolled or if there is any other complication of pregnancy, the woman should be referred to higher facility and the frequency of antenatal visits should be increased.

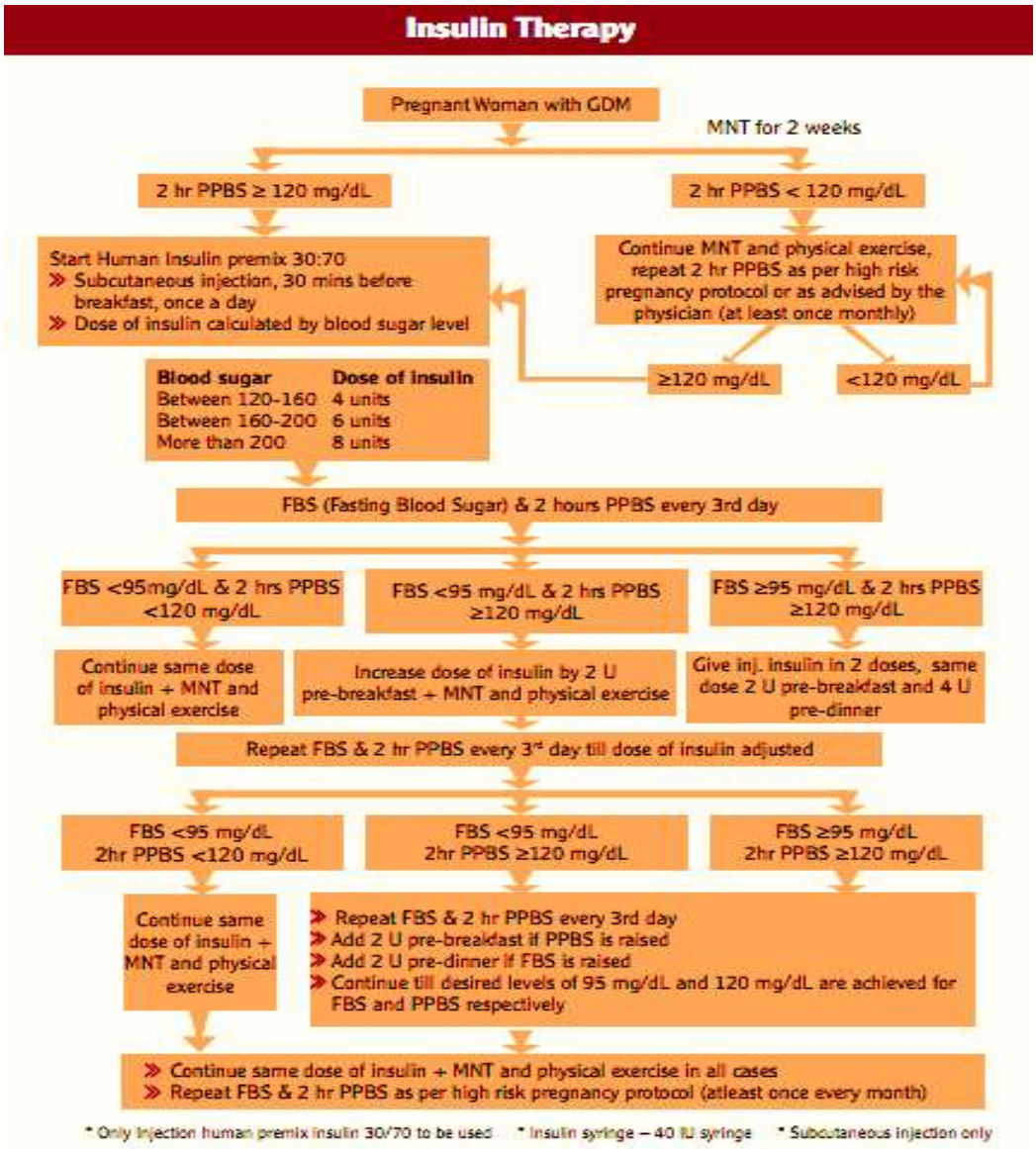
3.9.5.1 Fetal surveillance in pregnant women with GDM: Women with GDM are at increased risk for fetal death and this risk is increased in women requiring insulin. Fetal heart rate should be monitored by auscultation on each antenatal visit. Antepartum fetal monitoring is necessary to prevent intrauterine fetal death and decide the timing of delivery.

Explain the woman about daily fetal activity assessment. Ask her to lie down on her side after a meal and note how long it takes for the fetus to kick 10 times. If the fetus does not kick 10 times within 2 hrs, she should immediately consult a health care worker and should be referred to a higher centre for further evaluation.

Nonstress test (NST) is started from 32 weeks onwards.

USG: Fetal growth and liquor volume is assessed by USG. Umbilical artery doppler studies help in detecting fetal jeopardy and in deciding the time of delivery.

Figure 4. Insulin Therapy



3.9.6 Labour& Delivery

Women with GDM on insulin therapy with uncontrolled blood glucose levels (2 hr PPPG ≥120 mg/dl) or insulin requirement >20 U/day should be referred around 34-36 weeks to gynecologist at CEmOC center for planning of delivery.

Timing of delivery: If a woman with GDM with well controlled plasma glucose has not already delivered spontaneously, induction of labour should be scheduled at or after 39 weeks pregnancy.

Women with GDM with poor plasma glucose control, those with risk factors like hypertensive disorder of pregnancy, previous still birth & other complications should be delivered earlier. The timing of delivery should be individualized by the obstetrician based on results of fetal monitoring tests.

Vaginal delivery should be preferred, and caesarean section should be done for obstetric indications and in case of fetal macrosomia.

If delivery is required between 24-34 weeks, Inj Dexamethasone should be given as per protocol. More vigilant monitoring of blood sugar should be done for next 72 hours. If blood sugar is increased the insulin dose should be adjusted accordingly.

Women with well controlled blood sugar levels can be delivered at the respective facility.

3.9.8 Post-delivery follow up

Maternal glucose levels usually return to normal after delivery.

- On day 3 of delivery: Perform fasting & 2 hour post prandial (PP) plasma glucose
- At 6 weeks: Perform 75 g oral GTT. PP < 140 mg/dl is normal.
- Fasting plasma glucose: ≥ 126 mg/dl, and 2-hour plasma glucose ≥ 200 mg/dl indicates diagnosis of Diabetes mellitus.
- PP between 140-199mg/dl: Impaired glucose tolerance (IGT)

If the test is normal the woman is counseled about lifestyle modifications, weight monitoring & exercise. These women are at high risk to develop type 2 diabetes mellitus in future. They should attend NCD clinic for annual screening. Oral glucose tolerance test (OGTT) should be repeated every year. If the test is positive: Woman is advised to consult a physician.

3.9.9 Pre-conception care & Counseling

Woman with history of GDM should be counseled about optimization of BMI before next pregnancy. She should have adequate control of blood sugar before next pregnancy. She should take Folic acid 5 mg daily for 3 months prior to planned pregnancy

Points to remember and counseling messages:

- Every pregnant woman should be screened for GDM at her first ANC visit and again at 24-28 weeks if testing negative.
- During pregnancy, blood sugar needs to be controlled. Poor sugar control is harmful.
- GDM can be easily controlled by diet and exercise.
- If blood glucose is not controlled by diet, oral Metformin or insulin injections are required.
- Insulin injections will be stopped in most cases after delivery.
- Pregnant women with GDM should deliver at well-equipped health facilities. It will help in management of any complications in baby.
- Pregnant women with GDM and their offspring are at increased risk of developing type 2 diabetes mellitus in later life.
- The woman needs to follow healthy lifestyle regarding diet & exercise and regular medical checkup is important.

3.10 Role of health personnel

ASHA/ANM should counsel pregnant women for timely testing for GDM and follow up.

MO at PHC/RH: Identification of GDM cases by counseling and testing plasma sugar level two hours post 75-gram glucose. Initiate medical nutrition therapy for those detected to have GDM. Check response after 2 weeks of MNT. Start medical management for women with post meal plasma glucose > 120 mg (Metformin/Insulin injections). Deliver uncomplicated cases, provide postpartum follow up care.

Specialist at DH/ CEmONC: Medical management by insulin, monitoring for control, fetal monitoring, obstetric management. Managing all referrals and obstetric/medical complications.

3.11. Screening for Hypothyroidism during Pregnancy

3.11.1 Introduction

Hypothyroidism is a state of thyroid hormone deficiency. Iodine deficiency and autoimmune thyroid disease are the causative factors. Primary hypothyroidism is elevated TSH levels during pregnancy. It can be overt or subclinical. Untreated hypothyroidism during pregnancy is associated with 2-3 fold risk of pregnancy complications. Presence of thyroid peroxidase (TPO-Ab) antibodies increases the risk of pregnancy loss[75].

Prevalence of hypothyroidism during pregnancy in Indian populationreported in numerous studies is 4.8- 12%: International studies report an estimated prevalence 2-3%; (Overt up to 0.5%, subclinical 2-2.5%).

3.11.2 Effects of Hypothyroidism on Pregnancy Outcome

Mother	**Baby**
Miscarriages, recurrent pregnancy loss	LBW, Fetal growth restriction, Preterm birth
Pre-eclampsia, Anaemia, GDM	Fetal distress during labour, Intrauterine fetal death
Placental abruption, PPH	Cognitive, neurological and developmental impairment leading to low IQ

3.11.3 Screening Strategy

The current evidence does not support universal screening for hypothyroidism during pregnancy, however TSH screening is recommended for high risk group[3]. Some observations suggest that limiting screening to high risk groups may miss about 30% of cases. National guidelines recommend screening of all pregnant women at risk for hypothyroidism. Indian Thyroid society however recommends screening for all pregnant women during first trimester as soon as pregnancy is confirmed.

Highrisk factors for hypothyroidism

- Residing in an area of known moderate to severe iodine deficiency (Area mapping)
- Obesity: BMI $\geq$ 25 Kg/M^2 (Pre-pregnancy or first trimester)
- H/O infertility
- H/O recurrent miscarriages, preterm births, intrauterine fetal demise, Pre-eclampsia-eclampsia, placental abruption
- H/O diagnosed mental retardation in previous births or in family
- H/O prior thyroid dysfunction, thyroid surgery or postpartum thyroiditis
- Symptoms of thyroid dysfunction or presence of goitre
- Known cases of autoimmune disorders (SLE, rheumatoid arthritis, Type I diabetes mellitus, Addison's disease etc.)
- History of thyroid dysfunction in first degree relatives (parent, sibling, children). Family H/O autoimmune thyroid disease. Positive thyroid auto antibodies
- Use of amiodarone or lithium, recent administration of iodinated radiologic contrast

3.11.4 Screening test: Thyroid stimulating hormone (TSH) testing. Pregnancy trimester specific TSH levels should be used for diagnosing hypothyroidism during pregnancy.

Negative test: Normal ranges → During First trimester: 0.1 to 2.5 mIU/L; Second trimester 0.2 to 3 mIU/L; Third trimester: 0.3 to 3 mIU/L)

Positive test: TSH > 2.5 mIU/L (in 1st trimester)

- Subclinical hypothyroidism (SCH): Serum TSH between 2.5 and 10 mIU/L with normal FT4 level
- Overt hypothyroidism (OH): Serum TSH > 2.5 to 3 mIU/L with low FT4 levels or TSH >10 mIU/L irrespective of FT4 levels.

3.11.5 Treatment

If TSH is elevated refer the pregnant woman to physician at district hospital for starting the treatment. Levothyroxine is the treatment. Starting dose for SCH with TSH<10 mIU/l can be 25 mcg /day and for TSH level > 10 mIU/l it should be 50 mcg/day.[4]

Thyroxine should be taken early morning on empty stomach. Medicine ingestion and the ingestion of iron supplements, calcium supplements and soy-based food should be separated by at least 4 hours.

Follow Up: TSH should be repeated after 4- 6 weeks of starting the treatment to see the response. Target TSH levels should be kept below 2.5 mIU/l in first trimester and below 3 mIU/l during second and third trimesters. If target TSH level is not achieved, the dose should be increased by 25 mcg/day. Dose should be adjusted according to TSH levels. At any time TSH below 0.1 mIU/l should be avoided by decreasing the thyroxine dose by 25 mcg from the current dose.

Uncomplicated cases can be delivered at PHC/RH under supervision of medical officer. After delivery, if initial TSH was < 10 mIU/l, the treatment is to be stopped. If it was > 10 mIU/l the same dose will need to be continued after delivery. If a woman was on thyroxine before pregnancy she should revert to her pre-pregnancy dose.

TSH should be repeated 6 weeks postpartum and further treatment decided accordingly.There is risk of developing postpartum dysfunction in women with autoimmune thyroiditis, hence it is important to continue monitoring thyroid function tests for at least 6 months after delivery.

3.10.6 Point to Remember: Screen all pregnant women at risk of hypothyroidism by TSH testing. Treat if TSH is above normal range by Levothyroxine. Monitor response. Detecting and correcting thyroid hormone deficiency during earlypregnancy helps in proper brain development of fetus and improving the pregnancy outcome.

3.11.7 Role of health personnel

MO PHC/RH: Identification of risk of hypothyroidism, counseling and testing thyroid function (TSH in early pregnancy). Diagnosis of hypothyroidism by elevated TSH levels

Levothyroxine therapy as advised by specialist, TSH monitoring, Referral of complicated cases to specialist, deliver uncomplicated cases, provide postpartum follow up care.

3.12. Monitoring Weight Gain During Pregnancy

3.12.1 Purpose: The nutritional requirements are increased during pregnancy more so during the third trimester. Pregnant woman needs additional 350 calories and 15 gm proteins daily. Requirements of iron, calcium, vitamins are also increased.

Monitoring maternal weight gain during pregnancy can alert the health care provider of maternal undernutrition. As per ICMR guidelines the recommended weight gain during pregnancy is 10-12 Kg. A pregnant woman should gain around 3-5 Kg in second trimester (0.3 Kg/week) and 5-6 Kg (0.5 Kg/week) in third trimester.

3.12.2 The recommendations for weight gain depend on the pre-pregnancy BMI as given in Table 14 below:

Table 14: Recommendations for weight gain during pregnancy based on the pre-pregnancy BMI

Pre-pregnancy weight	BMI (kg/m2)	Total weight gain range (kg)
Normal weight	18.5 to 24.9	11.5 to 16 kg
Under weight	Less than 18.5	12.5 to 18 kg
Overweight	25 to 29.9	9 7 to 11.5 kg
Obese	Equal/more than 30	5 to 9 kg

Common cause of poor weight gain is dietary deficiency leading to undernutrition.

3.12.3 Effects of Maternal Undernutrition: Pregnant women who are underweight and those who fail to gain weight adequately often give birth to LBW baby, both due to prematurity and IUGR increasing the risk of infant mortality and morbidity.

Mother weighing 40 Kg or less during first trimester has 5-6 times greater risk of having preterm and LBW baby. Maternal height less than 145 cm has 3 times greater possibility of having a preterm/IUGR baby. Fetal undernutrition can result in chronic diseases in adulthood e.g. diabetes, hypertension, coronary heart disease (Fetal origin of adult diseases).

Undernourished mother can suffer from nutritional anaemia, increased risk of hypertension, placental abruption and postpartum sepsis.

Women having low BMI are having less total blood volume and therefore do not tolerate excessive blood loss at delivery and are prone to go in shock.

3.12.4 Intervention: At 1st visit (before 12 weeks), record her height and weight. Calculate BMI and classify her as normal, underweight, overweight or obese. Assess quantity and quality of diet. Calculate deficit. Counsel for diet modifications to correct the deficit.

At each subsequent visit note the weight gain since the previous visit and calculate the increase per month. If weight gain is < 1.3 Kg/month; ask her the probable cause. Rule out continuing nausea, vomiting, deficient diet, heavy work, domestic abuse, depression, bowel problems, and fever. Refer to medical officer for treatment for any ill health. Reinforce dietary counseling. Explore mechanisms to provide nutritional supplements in cases having gross nutritional inadequacy that cannot be managed at family level. Take her to local Aanganwadi and arrange for food supplement if possible.

Check weight every month. If weight gain is < 2 kg/month during third trimester, check the fundal height and look for fetal growth restriction.

If the weight gain is excessive, (> 3 Kg /month) look for signs of Pre-eclampsia. Record blood pressure and test urine sample for proteins.

3.12.5 Points to Remember

- Maternal nutritional requirement is increased during pregnancy and further increased significantly from 28 weeks onwards
- Detecting poor or no weight gain and supplemental nutrition can help in reducing the chance of giving birth to a low birth weight baby.

3.12.6 Role of health personnel

ANM should record weight of every pregnant woman accurately at every ANC visit. Calculate the weight gain in Kg/month from the previous visit. Check whether the weight gain is satisfactory,less or excessive. Counsel the pregnant women having poor or no weight gain during pregnancy for consuming extra meals and energy dense food. Follow up after 1 month to check whether there is gain in weight and refer to medical officer if there is no improvement.

MO PHC/RH: Nutrition counseling, provide supplements as possible, detect and treat any ill health. Screen for fetal growth restriction (FGR) and refer to specialist for evaluation.

CEmONC: Provision of care to referred women and manage the cases having severe fetal growth restriction.

3.13. Monitoring Blood Pressure during Pregnancy: Hypertensive Disorders of Pregnancy

3.13.1 Purpose: Hypertensive disorders of pregnancy are responsible for about 14% of maternal deaths in India. Pre-eclampsia-eclampsia is the second leading cause of maternal mortality in India. Early detection and prompt care can save lives.

3.13.2 Definitions: The definitions of gestational hypertension, pre-eclampsia and Pre-eclampsia with severe features is given in Table 15.

Table 15 :Definitions

Diagnosis	Criteria
Gestational Hypertension	BP ≥ 140/90 mmHg at least on 2 occasions 4 hours apart after 20 weeks of gestation
Pre-eclampsia	Hypertension after 20 weeks of gestation and proteinuria ≥ 1 +
Pre-eclampsia with severe features	BP ≥ 160/110 mm Hg, Presence of any symptoms like severe headache, blurring of vision, epigastric pain, oliguria, pulmonary edema, HELLP syndrome*, S. Creatinine > 1.1 mg/dl
Eclampsia	Pre-eclampsia with Convulsions

Chronic hypertension	BP ≥140/90 mm Hg before 20 weeks of gestation

***** HELLP syndrome: Hemolysis, elevated liver enzymes, low platelet count
Note: Degree of proteinuria has not been included in severe features as it has not shown any correlation with pregnancy outcome

Risks to Mother and Baby

Maternal	**Fetal/Neonatal**
Eclampsia	IUGR
Cerebral oedema, haemorrhage, thrombosis	Stillbirth
Acute renal failure	Neonatal asphyxia
HELLP syndrome	
Blood coagulation failure (DIC) leading to hemorrhage	
Aspiration bronchopneumonia, Pulmonary oedema,	

3.13.3 Intervention: At each scheduled ANC checkup, check the woman's BP in sitting position. If BP is ≥ 140/90 mm Hg, record again after 30 minutes of rest in lateral position. Test her urine sample for proteinuria by dipstick testing at each scheduled ANC visit.

A) If BP ≥ 140/90 mmHg before 12 weeks: Refer to specialist for management of **chronic hypertension**

B) If BP ≥ 140/90 and < 150/100 mm Hg after 20 weeks and no proteinuria: Diagnose as ***Gestational hypertension***.

- Weekly clinic visitsat PHC to check blood pressure, symptom screening and proteinuria test. Ask the woman to report if any warning symptoms of severe pre-eclampsia (danger signs).
- Advise her to avoid exertion and to rest in left lateral position.
- She is allowed to take normal salt in food, but no extra salt should be added.
- **During observation if BP starts rising, (150/100 mm Hg or more) start antihypertensive medicines.** Antihypertensive drugs are not beneficial in mild hypertension.
    - Available options: Methyl dopa, Nifedipine or Labetalol tablets
- Methyl dopa 250 mg 3 times a day. Can be increased up to 500 mg 4 times a day.
- Nifedepine 10 mg 8 hourly, can be increased to 6 hourly (up to 80 mg/24 hrs)
- Labetalol: 100 mg twice a day. Can be increased as required
- Diuretics are not recommended.

C) If BP ≥ 140/90 mmHg after 20 weeks, proteinuria, no warning signs: Diagnose as **Pre-eclampsia.** Refer to FRU.

- Hospitalization for basic laboratory tests and clinical evaluation.
- Note pregnancy duration. Look for fetal growth restriction.
- If < 37 weeks: Ask her to keep daily fetal movement count (DFMC) chart from 28 weeks onwards, refer to specialist if she reports reduced fetal movements.

- When she is 37 weeks or more: Obstetric management based on maternal/fetal wellbeing, cervical assessment
- Early delivery if there are signs of fetal compromise, uncontrolled hypertensionor worsening maternal clinical or biochemical parameters

During observation, anytime if systolic BP is ≥ 160 mm Hg &/or diastolic BP ≥110 mm Hg or if she reports any of the warning signs, manage as severe Pre-eclampsia. She should be referred to a district hospital/ medical college for further care.

3.13.4 Management of Severe Pre-Eclampsia

Acute onset severe systolic (≥ 160) or diastolic (≥ 110 mmHg) hypertension persistent for 15 minutes or more is hypertensive emergency. Many maternal deaths are resulting due to cerebral hemorrhage and cerebral infarction as a result of uncontrolled hypertension.[5]Immediate hospitalization and emergency treatment to control blood pressure is required. Refer such women to district hospital after giving initial care.

- Monitor vital signs, BP, knee jerk and fetal heart rate. Urine output charting,
- Watch for warning signs: Severe headache, drowsiness, mental confusion, visual disturbances (e.g. blurred vision, flashes of light, double vision), upper abdominal pain, nausea, vomiting, decreased urine output, exaggerated knee jerk.

3.12.4.1 Control hypertension: Give immediate release oral nifedipine, oral Labetalol or IV Labatalol to achieve systolic BP between 140-150 and diastolic blood pressure between 90-100 mmHg. Lowering of BP below this level is harmful to fetus.

Immediate release oral nifedipine: Cheap, easily available, safe medicine. It does not affect the uteroplacental circulation. Nifedipine is a calcium channel blocker and has a direct vasodilator action. Nifedipine can be associated with increased maternal heart rate and hypotension. ***It should not be given sublingually.*** WHO recommends *maximum dose of 30 mg in acute setting.*

Initial dose 10 mg → Record BP after 30 minutes. If BP still high repeat nifedipine

Alternatively, **Labetalol** can be given which is an adrenergic blocking agent.

Oral Labetalol: 200 mg initially → Record BP after 30 minutes. Repeat 200 mg after 1 hour until the treatment goal is achieved. Max dose 1200 mg in 24 hours.

IV Labetalol: It has a quick action and is safe in controlling acute severe hypertension. It is contraindicated in asthma, heart disease and congestive cardiac failure. It may be associated with neonatal bradycardia.

Initial dose 20 mg over 2 minutes → Record BP after 10 minutes, If BP still high → Repeat 40 mg IV → Record BP after 10 minutes, If BP still high→ Repeat 80 mg. After 10 minutes if BP is still high repeat 80 mg or switch over (Max dose 220 mg)

- BP monitoring as recommended is essential while administering all medicines.
- The use of these medicines does not require cardiac monitoring.
- Patients may respond to one drug and not other and switching to another option having different mechanism of action may be needed.
- Differences in the recommended intervals of monitoring blood pressure reflect the differences in their pharmacokinetics.

Monitoring BP: Once the blood pressure has been brought down to safe levels, record BP every 15 min for 1 hour, every 30 min for 1 hour, every 1 hour for 4 hours. (Can use continuous monitoring if available).

Once the blood pressure is below the threshold level, continue oral nifedipine or labatalol as required to maintain BP 140-150 systolic and 90-100 mm Hg diastolic.

*3.12.4.2 Laboratory Tests:*Pre-eclampsia is associated with impairment of renal, liver and coagulation function. To identify early signs of impaired organ function renal, liver function and coagulation profile needs to be assessed at baseline and periodically thereafter to detect deterioration of organ function. Once proteinuria is detected there is no need to repeat it for quantification.

Urine- Albumin, sugar, Hb%, PCV, Platelets, bleeding time, clotting time, blood urea, serum creatinine, serum uric acid, serum bilirubin, SGOT, SGPT. serum LDH, Fundoscopy.

- The baseline lab tests should be done at detection of Pre-eclampsia.
- Repeated twice a week in Pre-eclampsia
- Thrice a week in Pre-eclampsia with severe features if on expectant treatment

Watch for critical levels:

- Serum creatinine: 1.2 mg/dl
- SGPT 1.5 times the upper limit of normal (ULN) /> 70 IU/l
- Platelet count: < 100000/µL

Look for **HELLP Syndrome: An emergency requiring urgent referral to tertiary centre.** Platelet count of ≤ 100,000/µL; AST or ALT levels of ≥ 70 IU/L; LDH ≥ 600 IU/L (with haemolysis as evidenced on abnormal peripheral smear, raised serum bilirubin level). Malaise, nausea, vomiting, epigastric and right upper quadrant pain, headache, visual changes, jaundice, nonspecific viral syndrome types of symptoms.

- Diuretics should not be used unless there are signs of pulmonary edema**.** Record respiratory rate andauscultate lung bases to look for signs of pulmonary edema.

*3.12.4.3*Prevent fits. **Magnesium sulfate (MgSO4) is the drug of choice.**

Loading dose (4 gm IV + 10 gm IM) followed by maintenance dose as given in Table 16.

Table 16 :Protocol of Treatment with Magnesium sulfate (MgSO4)

Loading dose (Total 14 grams)	**Maintenance Dose**
4 g of 20% MgSO4 (8ml MgSO4 50% + 12 ml NS/ distilled water in 20 ml syringe. Give slow IV in 5-10 minutes	5 g (10ml) 50% MgSO4 (5 amp) deep IM in alternate buttock every 4 hours
5 g (10mL of 50 %) MgSO4 deep IM in each buttock	To be continued for 24 hours after last convulsion / delivery- whichever occurs later
If fits recur after 15 minutes of loading	Watch for toxicity signs before next dose. With

dose: 2 gm IV (4 ml MgSO4 + 6 ml NS/DW)	hold the next dose in case of presence of any of the following: • Urine output: < 25-30 ml/hour • Deep tendon reflex (knee jerk): Absent • Respiratory rate: < 16/minute
Give antidote Inj. Calcium gluconate (10 ml 10 %) slow IV for respiratory toxicity	

At Subcenter: Only intramuscular loading dose of 10 gm should be given before referral. 5 g (10ml) in a 10 ml syringe MgSO4 deep IM in each buttock.

3.12.4.4Obstetric management

Pre-eclampsia with severe features: Hospitalize until delivery and stabilization. Monitor clinical parameters every 4 hours. Perform laboratory tests thrice a week.

- Diagnosed before 24 weeks, termination of pregnancy is recommended as fetal salvage is difficult.
- Between 24-34 weeks expectant management can be considered if fetal and maternal condition permits. Administration of antenatal corticosteroids recommended if indicated. If BP controlled keep woman under regular maternal & fetal surveillance.
- Beyond 34 weeks the decision of terminating pregnancy any time depending on clinical circumstances.

Time of delivery, mode depending on maternal, fetal status, cervical status, gestational period and other factors.

During labour monitor BP every hour.

3.12.4.5 Postpartum care: Monitor BP 4 hourly until discharge. Once between day 3 & 5, if high on alternate days till BP is normal. Ask H/O severe headache, epigastric pain each time. Repeat lab tests after 48-72 hrs. Record BP at 6 weeks and 12 weeks. If BP is high at 12 weeks postpartum, refer her to physician for evaluation of chronic hypertension.

3.13.5 Management of Eclampsia

*Nursing care:*Keep the patient in a quiet room in a bed with padded rails on sides. Place the woman on her left side. Evaluate vital signs.

- Clean the mouth & nostrils by applying gentle suction. Give oxygen.
- Prevent injury to tongue by putting airway/padded tongue blades.
- Start IV line with Ringer lactate/ Normal saline: Give slowly @ 60 ml/hour.
- Insert Foley catheter. Monitor hourly urine output. It should be at least 30 ml/hour.
- Record fluid intake. Maintenance of proper fluid balance is essential to prevent dehydration or pulmonary oedema.
- If not breathing check airway and give bag and mask ventilation.

*Control fits***:** Inj MgSO4 as described for severe Pre-eclampsia.

*Control hypertension***:** Nifedipine or Inj labetalol as described.

Delivering the baby: In eclampsia, delivery should occur within 12 hours of the onset of convulsions. If woman is not in labour: Refer her urgently to FRU as she needs induction of labour.

If woman is in active labour: Monitor the progress of labour and deliver. Augment labour by amniotomy and oxytocin infusion as required. Watch for signs of fetal distress. Cut short the second stage of labour. Give prophylactic oxytocin for AMTSL. Do not give Inj Methyl ergometrine.

Post-Partum Care: Fits can also occur for the first time in the immediate postpartum period. Monitor BP and the urine output after delivery. Continue antihypertensive medicines to maintain diastolic BP between 90 – 100 mm Hg. Advise the woman to have her BP checked regularly until BP returns to normal. If BP remains high at 12 weeks diagnose her as chronic hypertension and refer her to physician for evaluation.

3.13.6 Role of health Personnel

ANM: Record blood pressure of every pregnant woman at each scheduled visit and test her urine sample for proteinuria by dipstick test. Note warning signs indicating severe disease.

Categorize the women having hypertension as gestational hypertension, Pre-eclampsia, severe Pre-eclampsia, eclampsia. Refer every woman having Pre-eclampsia to medical officer for laboratory tests. Refer woman having fits to FRU.

Refer every woman having severe Pre-eclampsia/eclampsia showing signs of organ dysfunction to district hospital/medical college hospital.

Give Inj MgSO4 to prevent fits and tab nifedipine to control blood pressure before referral to FRU as per protocol

Medical officer: Investigate women having Pre-eclampsia to detect organ dysfunction.

Refer women having severe Pre-eclampsia / eclampsia to DH after giving loading dose of MgSO4 and antihypertensive medicines.

Conduct delivery if woman is in advanced labour and then refer.

DH/FRU: To investigate hypertensive women for organ dysfunction and note the severity of the condition, and to offer multispecialty care to critical cases.

Evaluate fetal wellbeing and decide the timing and mode of delivery. Care of newborn.

3.14. Monitoring Danger Signs

Every pregnant woman should be informed about the danger signs which when appear she should report immediately to ASHA/ANM. The following symptoms are indicators of some complications for which emergency evaluation and care could be needed.

- Vaginal bleeding during pregnancy.
- Vaginal watery discharge suggestive of rupture of membranes
- Pain in abdomen
- Severe headache, blurred vision, upper abdominal pain, passage of less urine
- Fever, difficulty in breathing
- Reduced fetal movements

The care of women presenting with any of these danger signs includes correct diagnosis, provision of initial care and appropriate referral as indicated.

3.14.1. Vaginal Bleeding During Early Pregnancy

A woman may present with history of a short period of amenorrhea followed by vaginal bleeding. Abortion, hydatidiform mole and ectopic pregnancy are the common underlying conditions, while an occasional woman may simply have delayed menstruation. Ruptured ectopic pregnancy is a life-threatening condition needing immediate surgical intervention. Clinical presentation of abortion may be as Threatened abortion, Incomplete abortion, Complete abortion, Missed abortion or Septic abortion.

3.14.1.1 History and Evaluation:

- Assess period of amenorrhea, amount and duration of bleeding, nature and severity of pain. Bleeding may be scanty in threatened and missed abortion and profuse in incomplete / inevitable abortion. Pain is severe in ruptured ectopic pregnancy.
- Perform pelvic examination: Note the condition of cervix, uterine size, look for pain on cervical manipulation and tender adnexal mass.
- Arrange for ultrasonography and pregnancy test.
- Make a diagnosis with the help of following chart. Refer to specialist for further management.

3.14.1.2 Differentiating Features : Differentiating Features of Threatened abortion, Incomplete abortion, missed abortion, Hydatidiform Mole and Ectopic pregnancy are given in Table 17.

Table 17. Differentiating Features of Threatened abortion, Incomplete abortion, Missed abortion, Hydatidiform Mole and Ectopic pregnancy

Particulars	Threatened abortion	Incomplete abortion	Missed abortion	Hydatidiform Mole	Ectopic pregnancy
Uterine Size in relation to POA (Premature Ovarian Aging)	Corresponding , Internal OS closed	Smaller, Internal OS open	Smaller	Larger	Smaller
Vaginal bleeding	Slight	Heavy	Absent or brownish discharge	Recurrent small amount	Slight/absent
Pain	Mild or Absent	Significant cramping pain	Absent	Absent	Severe, continuous
G.C. pallor, tachycardia	Fair	Proportional to blood loss	Fair	Fair	Out of proportion to visible blood loss.
Tenderness Abdomen /vaginal	Absent	Absent (Unless infected)	Absent	Absent	Marked
USG	Intrauterine viable pregnancy	Some products in uterine cavity	Nonviable pregnancy	Snowstorm appearance	Empty uterus pelvic/adnexal mass. Free fluid in abdomen
Risks	Preterm/IUGR	Hemorrhage, Sepsis	Coagulation failure	Hemorrhage	Shock (Intra peritoneal bleeding)

3.14.1.3. Treatment guidelines

a) Threatened abortion: Advise avoiding exertion, sexual abstinence and regular ANC follow up. Pregnancy has higher risk of having recurrent episodes of bleeding, APH, fetal growth restriction, preterm delivery. If the bleeding persists a repeat USG is done to check for fetal viability.

b) Missed Abortion: Ultrasonography confirms the diagnosis. Bleeding time, clotting time, prothrombin time, platelet count are done as there is risk of coagulation failure with prolonged retention of dead fetus. The pregnancy needs to be terminated. If uterus < 12 weeks, manual/electrical vacuum aspiration is performed at CAC center. If uterus is > 12 weeks refer her to specialist at RH/DH.

C **Incomplete abortion:** Rapid clinical assessment is done. Antibiotics are started, and uterus is emptied by vacuum aspiration. Resuscitation of shock and blood transfusion may be needed in some women.

d) Septic abortion: Unsafe abortion, retained products of conception in cases of incomplete abortion, failure to follow adequate aseptic precautions can result in septic abortion. Anemia aggravates sepsis.

*Symptoms and signs:*Fever, tachycardia, lower abdominal pain, offensive vaginal discharge and pelvic tenderness.

Treatment: Inj. Ampicillin 1gm 6 hourly IV, Inj. Gentamicin 80 mg IM 12 hourly, Inj. Metronidazole 500 mg IV 8 hourly slowly. If woman is well, Ampicillin and Metronidazole can be given orally.

Surgical evacuation of uterus under cover of antibiotics if there are retained products.

Cases having severe sepsis with complications need to be referred to district hospital.

Counsel women having abortion to avoid pregnancy at least for 6 months.

e) Ectopic pregnancy: The commonest site of ectopic pregnancy is the fallopian tube. It can present as tubal rupture with severe intra peritoneal bleeding leading to shock, tubal abortion or unruptured tubal pregnancy.

*Ruptured ectopic pregnancy***:**Presents with severe and acute pain in abdomen with severe intra peritoneal bleeding which is continuing. There is tachycardia, severe pallor and hypotension. The abdomen is tender and distended with signs of free fluid in abdomen. Vaginal examination is extremely painful, and an ill-defined mass may be felt in posterior and lateral fornix. USG shows free fluid in abdomen and vague ill-defined pelvic mass.

Treatment: Urgent referral for management of shock, surgical exploration to stop the bleeding and blood transfusion.

Some cases have less acute presentation with significant pain in lower abdomen, vaginal bleeding could be slight or even absent. Clinical condition is usually stable. Pallor and tachycardia are present depending on the amount of internal bleeding. There is tenderness in lower abdomen. Cervical movements are painful and fornices are tender. Ultrasonography reveals some free fluid in abdomen. Referral should be made to gynecologist for laparoscopic surgical management. Chronic pelvic inflammatory disease (PID) needs to be excluded.

Unruptured ectopic pregnancy: It is possible to diagnose ectopic pregnancy before it ruptures by having a high index of suspicion. The woman will present with signs and symptoms of

pregnancy, may have a unilateral adnexal mass and a positive UPT; ultrasonography reveals an empty uterus.

Action: Refer such a woman to specialist for laparoscopic surgery. Medical management is possible for selected cases by giving Inj Methotrexate under careful monitoring.

f) Hydatidiform Mole: This is an abnormal pregnancy where there is no fetus, no amniotic sac and the uterus is full of proliferated trophoblastic tissue.

*Symptoms and signs:*Excessive vomiting, recurrent vaginal bleeding, rarely passage of grape like vesicles. Uterus is larger than the POA and soft / doughy in consistency. Ultrasonography reveals snow storm appearance, absence of fetus, amniotic fluid. The ovaries may be enlarged with multiple cysts. Pregnancy hormone beta HCG is markedly elevated.

Action: Referral to district hospital/medical college hospital for suction evacuation under general anesthesia. Blood needs to be kept ready as there is risk of severe hemorrhage during evacuation. Development of gestational trophoblastic neoplasia (GTN) is a possibility for which careful follow up is necessary.

*Follow up:*Baseline X ray chest and βhCG levels are tested before discharge. Regular βhCG monitoring is done till it falls to normal level and for 6 months thereafter as there is risk of development of GTN. It is important to avoid pregnancy by using combined oral contraceptive pills during this period. Intrauterine contraception is not recommended.During follow up, look for abnormal vaginal bleeding, enlarged soft uterus, evidence of any metastasis of choriocarcinoma (lungs, brain, anterior vaginal wall).

Pregnancy is allowed when βhCG level remains normal for 6 months. Referral to tertiary care centre is indicated for chemotherapy if βhCG levels show initial decline followed by a rise or it remains elevated (plateau).

3.14.2. Vaginal Bleeding During Late Pregnancy: Antepartum Haemorrhage (APH)

3.14.2.1 Definition: Bleeding from vagina after 20 weeks of pregnancy and before the birth of child. Two major causes of APH include:

- Abruptio placentae: Bleeding from premature separation of normally located placenta in the upper uterine segment.
- Placenta Previa: Bleeding from premature separation of placenta located in lower uterine segment.

Significance: Maternal mortality is high due to hemorrhagic shock and other complications. There is increased risk of atonic PPH after delivery. Lacerations of friable cervix also cause bleeding. Operative delivery rates are high.

Fetal and neonatal mortality is high due to prematurity (Spontaneous & iatrogenic), LBW and asphyxia.

Figure 5: Placenta Previa

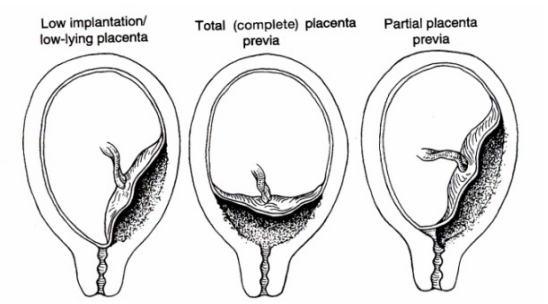
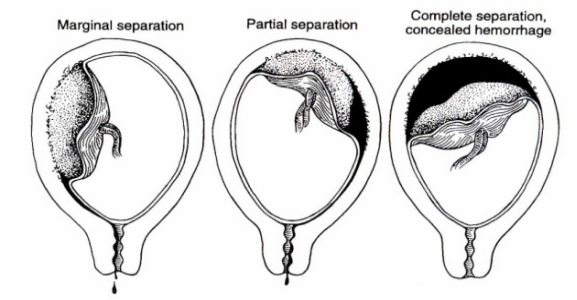


Figure 6: Abruptio Placentae



3.14.2.2. Case Management of APH

Referral to FRU is necessary. Even if bleeding is only a very small amount, hospitalization is required. Blood needs to be cross matched and reserved.

*History:*Ask the period of amenorrhea, fetal movements, time of onset of bleeding, amount, prior H/O warning hemorrhages. Abdominal pain present or absent and its severity, Passage of urine. Review prior USG reports if available.

Examination:

- Note pallor, tachycardia, general condition, record blood pressure and assess the amount of blood loss.
- In concealed accidental hemorrhage, although the woman is in shock, her BP may be normal as she could be having prior hypertension. Degree of pallor and tachycardia are more important for assessment of amount of bleeding and general condition.
- P/A: Note whether uterus is relaxed, contracting and relaxing or hard. Look for uterine tenderness, note fetal presentation and FHR
- No vaginal examination to be done until placenta previa is ruled out

3. 14.2.3 Differentiation between Placenta Previa and Mixed Abruptio Placentae

Differentiating features between Placenta Previa and Mixed Abruptio Placentae is given below

Table 18. Differentiation between Placenta Previa and Mixed Abruptio Placentae

Particular	Placenta previa	Concealed or mixed abruptio placentae
Pain	Painless recurrent vaginal bleeding	Painful bleeding
General condition	Pallor, tachycardia, restlessness proportional to visible amount of blood lost	Pallor, tachycardia disproportionately more than the visible amount of vaginal bleeding
Uterus	Relaxed, non-tender uterus, fetal parts felt well	Tense, tender, woody hard uterus, fetal parts cannot be felt

Particular	Placenta previa	Concealed or mixed abruptio placentae
Presentation	May be abnormal or head high floating	Presentation cannot be made out
Fetus	Fetal condition usually well if mother not in shock	Fetus often distressed or dead. FHS may not be heard
Dangers	Hypovolemic shock, PPH	Shock, acute renal failure, DIC, PPH
Action	No P/V examination. IV fluids, referral	IV fluids, referral, monitor clotting time and urine output

Investigations:

- Urgent USG to locate placenta and assessment of fetal condition and its gestational age.
- Full blood count, bleeding & clotting time, platelet count, prothrombin time.

a) Placenta Previa: If pregnancy duration is > 36 weeks, arranging blood and delivery at well-equipped institution is necessary. Expectant management can be given until 36 weeks for clinically stable patient with moderate blood loss having fetus alive and preterm. Pregnancy is terminated in maternal interest at any time during the observation period if there is uncontrolled bleeding.Caesarean section is required in most cases of placenta previa. Cases having low lying placenta(type 1 and type 2 anterior) can be delivered vaginally by amniotomy and oxytocin infusion. Women having previous caesarean and anterior placenta previa are likely to have morbidly adherent placenta (placenta accreta)leading to furious hemorrhage. Refer such case to tertiary care centre. Such case needs to have 4 units of blood to be kept ready and preparations for caesarean hysterectomy.

b) Abruptio Placentae: Presents with vaginal bleeding and abdominal pain. Hypertension and proteinuria may be present. In cases of severe abruption, uterus is hard, tender, not relaxing, fetal parts may not be felt well, fetus may be distressed/dead. When the fetus is dead at least 1,500 ml of blood is lost, hence shock is usual. Blood pressure may be normal in spite of being in shock as the initial BP may be high. Coagulation failure leading to severe bleeding is common. Patient can develop acute renal failure.

Management: Refer the woman to tertiary level of care having facility of providing blood and blood components for treatment of DIC. Monitor vitals. Insert Foley catheter and monitor hourly urine output until referral. Check clotting time. Give Ringer lactate for correction of hypovolemia until blood transfusion can be given. Labour is induced by ARM and oxytocin infusion. Caesareansection may be required for abruption with fetal distress or for heavy bleeding with uninducible cervix.

A patient of concealed accidental hemorrhage can be misdiagnosed as patient in labour with severe anemia with fetal death.

Be prepared to manage PPH in all cases of APH.

3.14.2.4 Referral: ANM/MO should refer a woman having APH to district hospital/FRU for evaluation and further care

Care during Referral:

- No vaginal examination to be done until USG is done and placenta previa is excluded.
- If the patient is pale, has tachycardia, start IV Ringer lactate and refer.

If the woman is in shock:

- Arrange for urgent referral. Explain the condition to the relative. Inform the referral centre.
- Start two IV lines with number 16 or 18 cannula. Start IV RL. Give 1 litre of RL in first 20 minutes
- Insert Foley catheter in urinary bladder. Note and record urine output on referral note.
- Accompany her during referral. Monitor vitals during referral

3.14.3 Vaginal Watery Discharge: Premature Rupture of Membranes (PROM)

3.14.3.1 Definition: PROM is rupture of membranes before the onset of labour. Preterm PROM is PROM occurring before 37 weeks. Term PROM is PROM after 37 weeks.

3.14.3.2 Risks:

- Maternal risk: Chorioamnionitis. May lead to severe sepsis
- Neonatal sepsis. Preterm PROM is associated with preterm delivery and results in significant neonatal morbidity and mortality due to prematurity and sepsis.
- Risk of complications is greater if PROM occurs before 34 weeks
- Risk of infection increases with number of vaginal examinations, the time between rupture of membranes and onset of labor, duration of labor, and mode of delivery

3.14.3.3 Diagnosis:

- History of vaginal watery fluid discharge (should not be confused with vaginal discharge due to vaginitis or frequent urination).
- Sterile speculum examination shows pool of fluid in vagina coming from cervix. Vulval pad is soaked.
- Ultrasonography shows reduced liquor, helps to confirm gestational age, estimated fetal weight, fetal presentation, and fetal malformations.

Avoid vaginal examination as it may lead to ascending infection and preterm labour

3.13.3.4 Management:

a) Preterm PROM: Pregnancy < 34 weeks: Expectant management

Refer the patient to FRU where SNCU facility is available for hospitalization. Give bed rest. Note maternal pulse, temperature, fetal heart rate 6-8 hourly. Start antibiotics. **Erythromycin** 250 mg 6 hourly for 7 -10 days is recommended (Avoid Amoxicillin-clavulinic acid)
Give single course of Inj Dexamethasone (6 mg 12 hourly total 4 doses)
Do not give tocolytic medicines.
Look for signs of chorioamnionitis, (Fever, tachycardia, tenderness over uterus, foul smelling liquor, fetal tachycardia, elevated WBC count), advanced labor, fetal distress, for which immediate delivery is indicated.
If no indication for immediate delivery, expectant management can be considered at the level of specialistwhich can be continued until 34 weeks if mother and baby are fine.

Uterine contractions and FHR are monitored. USG is done to monitor the fetal growth and wellbeing. Watch is kept on signs of chorioamnionitis. If present, labour is induced and broad-spectrum antibiotics are started.

At 34 weeks: Depending on the cervical status, fetal presentation, fetal condition mode of delivery is decided and labour is induced.
The number of vaginal examinations is restricted. Strict asepsis is necessary during vaginal examination and conduct of labour.
Women with PPROM should be screened for UTI, STI, and treated.

b) PPROM when pregnancy duration is > 34 weeks and < 37 weeks:
Generally, delivery under cover of antibiotics is recommended.

c) Pregnancy ≥ 37 weeks (Term PROM):

- PROM at term should be managed by delivery as the risk of maternal infection is high with expectant management.
- Hospitalize the woman. Note maternal pulse, temperature, fetal heart rate
- Assess the cervix, fetal presentation, fetal condition and decide the mode of delivery and induce labour if appropriate.
- Give Antibiotics when the membranes have been ruptured for ≥ 18 hours
- Observe clinical signs of infection, chorioamnionitis

3.14.3.5 Point to Remember: Timely detection and management of premature rupture of membranes is important for preventing sepsis in mother and new-born.

3.14.3.6 Role of health Personnel:
ASHA/ANM: Recognize the watery discharge reported by pregnant woman before 37 weeks as a danger sign and refer her to RH/FRU. Give first dose of Inj Dexamethasone if pregnancy duration is < 34 weeks
MO PHC/RH: Administer antibiotics Erythromycin before referral. Continue Inj Dexamethasone.
FRU/DH: Evaluation, confirmation of PROM and obstetric management as appropriate. (Expectant line of treatment or induction of labour)

3.14.4 Pain in Abdomen

3.14.4.1 Causes: A pregnant woman presenting with pain in abdomen needs to be assessed for finding the cause of pain. Pain in abdomen during early pregnancy could indicate possible threatened abortion or incomplete abortion. Severe pain could be due to ruptured ectopic pregnancy which requires urgent surgical treatment.

Pain in abdomen during late pregnancy can be due to uterine contractions indicating the onset of labour, term or preterm. The pain is similar to true labour pains and coincides with uterine contractions. General condition of the pregnant woman is fair.However other pregnancy related causes of pain need to be kept in mind.

- Abruptio placentae: concealed or mixed hemorrhage
- Rupture of scarred uterus if there is previous caesarean delivery
- Chorioamnionitis
- Severe Pre-eclampsia: Pain in upper abdomen (right upper quadrant) is a danger sign.

Sudden severe onset of pain which is continuous and is not like labour pains can be due to accidental hemorrhage due to premature separation of placenta. The bleeding may be

concealed. The life of mother and baby is in danger. Such women need urgent referral to well-equipped hospital.

If the woman having previous caesarean delivery presents with pain in abdomen near term it is necessary to check that she is having labour pains. Sometimes the pain can be due to rupture of the scar with bleeding inside the abdomen. Pallor and tachycardia may increase. Suprapubic scar tenderness indicates possibility of scar dehiscence.Such woman also needs urgent referral to CEmONCcentre.

3.14.4.2 Antenatal Corticosteroids in Preterm Birth

Definition & Significance: Preterm labor is onset of labour before 37 completed weeks of gestation. From survival point of view, the gestational age of 34 weeks is important. In India, about 35% neonatal deaths are due to prematurity and its complications. A single course of antenatal corticosteroids administered between 24 to 34 weeks of pregnancy has been shown to reduce the neonatal mortality and morbidity significantly in preterm born babies. [81]

Management If pregnancy is < 34 weeks,

1.Antenatal glucocorticosteroid therapy to enhance fetal lung maturity and reduce mortality and morbidity
2. Inhibition of preterm labor by administering oral tablets of Nifedipine
3. 'In Utero transfer': Referral of woman for delivery at higher centre having SNCU/NICU facility). Before referral always give the initial shot of steroid mentioning the time on the referral note.

Who can receive antenatal corticosteroid therapy? All women presenting with **s**igns of preterm labour between 24 to < 34 weeks of gestation.

All cases of spontaneous or induced preterm labour for severe Pre-eclampsia, antepartum hemorrhage, woman having premature rupture of membranes (PROM), where pregnancy duration is < 34 weeks should be given corticosteroids.

Which women should not receive corticosteroid therapy? If there is chorioamnionitis, (infection of fetal membranes) early delivery is safer for both mother and her baby. Signs of chorioamnionitis are: Fever, lower abdominal pain, tenderness over the uterus, fetal tachycardia (FHR > 160/minute), foul smelling liquor.

Intervention

Single course of Inj. Dexamethasone 6 mg 12 hourly IM for 48 hours total 4 dose*s or* Inj. Betamethasone 12 mg IM every 24 hours for 2 days

Benefits: Reduction in risk of respiratory distress syndrome (RDS) by 36-50% and neonatal mortality by 37-40%, is seen if birth was delayed by at least 24 hrs after initiation of therapy. The effect persists for 7 days after completion of course. Neonatal morbidity is reduced by 37% (Reduced risk of intraventricular hemorrhage, protection against neurological sequelae). Repeated courses should not be given as there is increased risk of neonatal complications and there are no added benefits.Record BP, urine proteins and sugar, time of giving injection on referral note.

Role of health personnel

ASHA/ANM shouldscreen every pregnant woman for risk of preterm birth**.** Ask the high-risk women to report the warning symptoms indicating possibility of preterm labor:

- Cramping discomfort/pain in lower abdomen, low backache, increased mucoid vaginal discharge
- Intermittent uterine contractions felt during discomfort

These symptoms are likely to be disregarded as normal pregnancy symptoms. In a high-risk case these are helpful in predicting the preterm onset of labor and early referral.

Correct assessment of pregnancy duration
When a pregnant woman reports with pain in abdomen, assess her pregnancy duration accurately (reviewing LMP, date when positive UPT was detected, sonography report in early pregnancy)
Confirm onset of labor: Intermittent painful uterine contractions (4 in 20 min or 8 in 60 mins) resembling true labour pains along with progressive change in the cervical dilatation and effacement assessed over 2 hours.

If a woman is in preterm labour, ANM should give first dose of Inj Dexamethasone before referral. Refer the woman to facility having SNCU. Until referral is possible continue to give Inj Dexamethasone as per protocol.

MO PHC/RH: Diagnose preterm labour. If the pregnancy duration is between 24-34 weeks give a single course of Inj Dexamethasone. Arrange for care of LBW baby.

3.14.4.3 Nifedipine during Preterm Labour

Purpose: For getting the benefits of antenatal corticosteroids, the birth of a preterm baby has to be postponed by about 48-72 hours. This can be achieved by administering tocolytic medicines to inhibit uterine contractions.
Nifedipine is a tocolytic drug that can inhibit the uterine contractions at least temporarily in preterm labor until effects of Inj. dexamethasone take place.
Nifedipine given orally is an effective, safe, low cost drug to postpone the childbirth in cases of preterm labour. It is more effective and safer than other tocolytic drugs. Nifedipine significantly reduces births within 7 days of treatment, as well as reduces neonatal morbidity (RDS, cerebral hemorrhage, and necrotizing enterocolitis) in babies born before 34 weeks.
Indication: Preterm onset of labour before 34 weeks if

- The cervix is < 3 cm dilated. There is no amnionitis, no fetal distress
- No pre-eclampsia or active bleeding.
- No cardiac disease.

Treatment:
Initial dose: 10 mg stat, if uterine contractions continue, repeat every 20 min for 2 more times (total 3 doses) [82]
Maintenance dose: 10-20 mg orally 4-8 hourly for 2-3 days depending upon the response.
Do not give if woman's BP is < 110/70 mmHg. Monitor pulse, B P, signs of respiratory distress, uterine contractions, FHR, vaginal bleeding or leaking.

3.14.5 Fever During Pregnancy

Fever during pregnancy is a danger sign to be reported by the family to ASHA/ANM and woman should be referred to medical officer.

Common causes of fever requiring specific treatment include urinary tract infections, malaria. Dengue fever, H1N1 infections need to be kept in mind. If there is history of vaginal watery discharge chorioamnionitis needs to be ruled out.

3.15:- Reproductive Tract Infections (RTI), Sexually Transmitted Infections (STIs)

Reproductive tract infections can be caused by poor genital hygiene, diabetes mellitus, lowered immunity and unsafe sex with an infected partner. Screening for RTIs/STIs during pregnancy is important. Most infections in women are asymptomatic and screening facilitates their detection. Most STIs can be treated. During pregnancy, some STIs can cause serious complications in the baby. Early detection and appropriate treatment can prevent vertical transmission of infections to the baby.

Effects of STIs on pregnancy

- The common STIs in a pregnant woman affecting the pregnancy outcome are: Syphilis, gonorrhea, chlamydia, HIV/AIDS, Hepatitis B, genital herpes, trichomonal vaginitis (TV).
- Candidial vaginitis (CV) and bacterial vaginosis (BV) during pregnancy can cause excessive vaginal discharge. These are not sexually transmitted but can have adverse effects on baby by causing PROM, preterm birth leading to LBW baby.
- Syphilis can cause stillbirth, congenital syphilis, neonatal death.
- Gonorrhoea, chlamydial infection can cause neonatal eye infection.
- Genital herpes infection can cause neonatal herpes, pneumonia, neonatal death.
- HIV is transmitted to the baby during pregnancy, labor, and breastfeeding.

Symptoms in women:

- Vaginal discharge, vulval itching, dysuria, frequency of micturition,
- Lower abdominal pain (PID)
- Genital ulcer, growth, lesion
- Swelling in groin due to enlarged inguinal lymph nodes.

Signs:

- Local examination helps in detecting genital lesions, herpes, warts, ulcers
- Speculum examination helps in detecting vaginitis, bacterial vaginosis, mucopurulent cervicitis and conducting simple tests on pathologic vaginal discharge

Investigations: VDRL, HIV test, Hepatitis B surface antigen test

Treatment: Symptomatic women with vaginal discharge during ^{2nd} and ^{3rd} trimester should be treated for BV, TV and yeast infection. Table30 summarizes the clinical presentation, treatment and pregnancy outcome regarding some of the common RTI/STIs

Table 19: RTI/STI Management During Pregnancy

RTI/STI	Symptoms/Signs	Diagnostic test	Treatment	Effect on pregnancy & Neonate
Trichomoniasis	Frothy, foul smelling, greenish vaginal discharge, vulval itching, dysuria. Vagina red	Wet saline mount of discharge shows motile organisms	Metronidazole, 400mg orally BD for 7 days or 2g orally single dose. Avoid alcohol. Treat partner	PROM, Preterm labour LBW
Bacterial Vaginosis	Greyish, white vaginal discharge, offensive fishy odor	10% KOH mount shows clue cells, fishy odour	Metronidazole 400 mg BD x7 days. No partner treatment	PROM, Prematurity LBW. Chorioamnionitis, Puerperal sepsis
Candidial Vaginitis	Intense vulval itching, burning at urination. Thickcurdy white discharge. Vagina red	10% KOH mount shows yeast	Miconazole or clotrimazole, 100 mg intravaginally daily for 6 days or Clotrimazole 500 mg vaginal pessary once at bedtime. Fluconazole not recommended in pregnancy.	
Gonorrhoea Chlamydia	Mucopurulent cervicitis, burning micturition, inflamed urethra. Vaginal discharge, lower abdominal pain	Gram stain	Cefixime, 400 mg orally single dose plus Azithromycin, 1g orally single dose 1 hour before food	Prematurity, PROM Chorioamnionitis, Postpartum sepsis. Conjunctivitis in newborn
Syphilis	Genital ulcer Painless swelling in groin (lymph node enlargement)	VDRL	Inj Benzathine Penicillin 2.4 mega units IM after sensitivity testing. If penicillin sensitive: Tab Erythromycin	Abortion, Stillbirth. Prematurity, IUGR Congenital syphilis

			500 mg 6 hourly x15 days	
Genital Herpes	Painful genital lesions/ulcers		Tab. Acyclovir 400 mg tds x 7 days. Analgesics, topical anesthetics	Abortion, Prematurity, IUGR, Congenital HSV. Neonatal infection

Screening and treatment of asymptomatic women with H/O abortion or preterm delivery for BV is recommended in view of high risk of preterm birth.

Genital Herpes Infection

It is a viral infection by genital herpes simplex type 2 virus (HSV 2).

First episode has severe symptoms as there are no antibodies in the body. Symptoms include rash on genitalia, severe pain, ulceration, enlarged and painful inguinal lymph nodes. Lesions persist for 2-3 weeks, cervical infection is common with virus shedding for longer duration.

Recurrent episodes have milder symptoms as there are antibodies. Viral shedding occurs for 2-5 days, may be subclinical, cervical involvement is less frequent.

Effects: Infection in early pregnancy may result in spontaneous abortion. In late pregnancy it can lead to preterm birth and neonatal infection. Neonatal herpes can have lesions on skin, eye, mouth. Encephalitis, disseminated multiple organ disease leading to neonatal morbidity and mortality is a possibility.

Neonatal infection occurs mostly around the time of childbirth from virus shed from cervix, fetus contacts the infection at vaginal delivery. Risk of neonatal HSV is high if mother gets primary episode near term (after 34 weeks) and when mother has lesions on genitalia at the time of delivery. Babies born to women with recurrent disease are at very low risk.

Treatment: Tab. Acyclovir 400 mg tds x 7 days. Analgesics, topical anesthetics

Women with genital herpetic lesions at the onset of labour should be delivered by caesarean section irrespective of duration of rupture of membranes to prevent neonatal herpes.

No partner treatment is recommended for herpes in the absence of active lesions. Sexual abstinence is advised until the lesions heal and treatment is completed.

Treatment of Newborn baby: Acyclovir, 10 mg/kg IV 3 times a day for 10 days.

Isolate the baby from other neonates. Close observation for 2 weeks. Mother and baby can be together. She needs to wash hands, avoid contacts between lesions, handsand baby. Breast feeding is allowed.

Role of health personnel:

ASHA/ANM: Refer pregnant women giving history suggestive of vaginal discharge or other RTIs to medical officer at PHC.

MO: Diagnosis and treatment of vaginitis and other infections as per guidelines.

3.16. Screening for Fetal Growth Restriction (IUGR)

Depending upon the birth weight and gestational age at birth, both full term as well as preterm born babies will be in one of three groups, small for gestational age (SGA), appropriate for gestational age (AGA), or large for gestational age (LGA) babies.

Intrauterine fetal growth restriction leads to low birth weight baby (LBW). Neonatal mortality for SGA babies is higher than the babies that are AGA for the same gestational age.

Risk factors

- Maternal: Low BMI (<18.5), short stature (<145 cm), teenage, age > 40, obesity
- Poor maternal nutrition, Poor weight gain during pregnancy
- H/O giving birth to LBW baby in previous pregnancy. Two-fold increased risk
- Short inter pregnancy interval
- Smoking tobacco, consumption of alcohol

Causes

- Placental insufficiency due to anemia, Pre-eclampsia, chronic hypertension, renal disease, cardiac disease, sickle cell disease, diabetes mellitus with vascular disease, malaria, twins, autoimmune conditions
- Vaginal bleeding during pregnancy, placental & cord abnormalities
- Fetal infections (e.g. Toxoplasmosis, Rubella), Congenital malformations in baby

Outcome

- Perinatal morbidity & mortality is significantly increased
- Intrauterine fetal death, birth asphyxia, acidosis, seizures, meconium aspiration, sepsis
- Neonatal hypoglycemia and hypothermia, polycythemia, hyperbilirubinemia, apneic episodes
- Abnormal neurologic development

Screening: All pregnant women should be clinically screened for IUGR

- During every antenatal check up the pregnancy duration in completed weeks on the day of visit should be calculated and noted. Fundal height should be measured in weeks and to see whether it is equal to, lesser or greater than the period of amenorrhea.
- Measuring fundal height in cm. from 24-26 weeks onwards helps in detection of fetal growth restriction. This measurement in cm correlates with weeks of pregnancy. Any lag > 2 weeks should raise suspicion of IUGR.
- Any pregnant woman suspected to have IUGR should be referred for USG.
- All at risk women need to be watched for IUGR (Previous H/O SGA Baby, APLAS,(Antiphospholipid antibodies) H/O PIH etc.). For those with risk factors, lagging growth or no growth, serial USG need to be performed.

Clinical exam is for screening for IUGR and diagnosis is by USG. Abdominal palpation alone has limited accuracy.

As a simple evaluation of fetal wellbeing at PHC and subcentre**, daily fetal movement count** (DFMC) should be started from 28-32 weeks. Women perceiving reduced fetal movements should report to the HCW as they need complete evaluation of fetal status.

Simple interventions that can be suggested at PHC level include:

- Maternal rest in lateral position to maximize uterine blood flow
- Reduce or eliminate stress, cessation of tobacco use.
- Correction of anaemia, improve nutrition, treatment of malaria
- Tests for diagnosis of sickle cell disease

Diagnosed cases of IUGR should have further investigations and obstetric management by specialist. USG, NST and Umbilical arterydoppler velocimetry are performed at the referral centre. Timing & mode of delivery is depending on fetal wellbeing, maturity, cervical status and evidence of fetal compromise. Induction of labor or caesarean section is performed depending on the individual case.

Preventive Interventions

- Smoking cessation is beneficial
- Low dose aspirin (antiplatelet agent) started around 12- 16 weeks in women at high risk of Pre-eclampsia can reduce the risk.
- For diagnosed cases of antiphospholipid syndrome, low dose aspirin and Inj. heparin can be used by a specialist to give a live birth in cases having prior H/O stillbirth.

3.17. Preventing Fetal death

Stillbirth: Baby showing no sign of life at birth after 20 weeks of gestation

Timing of fetal death can be antepartum (fetal death occurring before the onset of labour) or intrapartum (occurring during labour).

Causes:

- Fetal growth restriction due to placental insufficiency due to Pre-eclampsia, diabetes mellitus, renal disease, post-term pregnancy, autoimmune diseases
- APH, Rh isoimmunization, cholestatic jaundice during pregnancy
- Syphilis
- Intrapartum complications: Cord /hand prolapse, knotting of umbilical cord, loops of cord around the neck of infant, fetal distress, prolonged-obstructed labour, uterine rupture, delayed delivery of after coming head in breech presentation, delay in delivery of second twin, shoulder dystocia
- Hypertonic uterine action and inadequate relaxation of uterus due to excess oxytocin
- Birth defects
- Unexplained: Sometimes no cause can be detected.

Risk Factors:

- Previous history of preterm, SGA baby, stillbirth, Pre-eclampsia, placental abruption

- Smoking/tobacco/alcohol/illicit drugs/ exposure to environmental toxins
- Obesity, Maternal age < 18 years or > 35 years.
- Short inter pregnancy interval < 24 weeks

Role of pregnant woman, her family and the Village ASHA:

- Optimizing BMI before pregnancy, Correction of nutritional deficiency anaemia. Preconception folic acid
- Avoiding infections during early pregnancy
- Being watchful for fetal movements, reporting reduction/ cessation of fetal movements
- Reporting danger signals (significant abdominal pain, significant itching on body)
- Antenatal care and delivery under care of specialist

Managing post stillbirth pregnancy:

A woman with prior history of stillbirth should be referred to specialist early in pregnancy for evaluation. She should be seen by medical officer at every antenatal checkup. Monitoring fetal growth and wellbeing is important.

- VDRL test: Treatment of syphilis if positive
- Rh typing and blood group: Check whether Rh negative
- TSH and other tests as suggested by specialist
- Screening and management of diabetes during pregnancy
- Early USG dating scan (between 11-14 weeks), is useful for monitoring fetal growth. USG at 18-22 weeks for fetal anatomic defects
- Correct anaemia. Inclusion of micronutrients and extra proteins in diet.
- Monitor blood pressure and urine for proteins regularly at every visit. Detection and management of hypertensive disorders is important
- Detection and management of fetal growth restriction: Record fundal height in cm at every visit. USG 28 weeks onwards for growth parameters as advised by specialist.
- Note any symptom reported by her.
- Note the daily fetal movement count record from 28 weeks onwards
- NST and USG as advised by specialist
- Specific clinical interventions as guided by her clinical evaluation.
- Encourage the woman to follow the advice of specialist regarding timing of birth, mode of delivery.

Women reporting reduced fetal movement should have further evaluation to confirm the fetal wellbeing.

Obstetric management: Timing and mode of delivery based on the clinical evaluation by specialist. Delivery at 39 weeks or before as indicated. Delivery at CEmONCcentre, with all preparations ready for operative intervention and special neonatal care.

Assessment of fetal wellbeing in IUGR and high risk of fetal death.

DFMC: Women should be advised to be aware of their baby's individual pattern of movements. If they are concerned about a reduction in or cessation of fetal movements after 28 weeks of gestation, they should contact their maternity unit.They should be advised to lie on their left side and focus on fetal movements for 2 hours. If they do not feel 10 or more discrete movements in 2 hours, they should contact the ANM or

delivery point immediately. This is likely to be a false positive alarm in some women; however, evaluation is needed.

USG: Look for Oligohydramnios (Amniotic fluid index - AFI 5 cm or less or there is no vertical pocket > 2 cm). It indicates fetal compromise. Fetal movements are seen. Estimated fetal weight is noted. Umbilical artery doppler studies help in identifying fetal jeopardy and deciding the timing of delivery.

Nonstress test: This requires a cardio tocography machine. Baseline FHR pattern and beat to beat variability is seen. FHR is noted in response to fetal movement. Reactive test indicates well fetus (FHR increased by > 15 beats lasting for 15 seconds in response to fetal movement seen on CTG trace).

Fetal compromise is indicated by reduced AFI, nonreactive NST, reduced fetal movements when further evaluation and immediate delivery is indicated.

3.18. Preventing Post-Term Pregnancy

Post term pregnancy is a pregnancy that has crossed 42 weeks. This is a high-risk pregnancy. In some women, there is placental insufficiency leading to postmaturity syndrome while in some the placental function continues leading to large baby.

Risks of post term pregnancy

Maternal Risks	Fetal Risks
Difficult labor	Increased perinatal mortality beyond 42 weeks
Perineal tears due to delivery of a big baby	Uteroplacental insufficiency, resulting in ***Post maturity syndrome*(PMS)*** growth restriction, oligohydramnios, fetal distress and meconium release leading to meconium aspiration syndrome, fetal hypoxia and acidosis
Increased chance of caesarean section	In some cases, fetal macrosomia increasing the risk of shoulder dystocia, risks of injuries to baby.

*The baby shows loss of subcutaneous fat, wrinkled, dry, cracked skin described as old man look. It has long thin body and long nails.

3.18.1 Prevention

- Record expected date of delivery (EDD) of every pregnant woman on her card. Ask whether her menstrual cycles before conception had been regular.
- ASHA/ANM should check whether the woman has crossed her EDD and refer her to the medical officer.
- Check for any complications. In pregnancies complicated by hypertension, Pre-eclampsia, IUGR the fetus is at greater risk of asphyxia. Hence these women should not be allowed to cross their EDD. They should be referred to specialist as they need to be delivered early.
- If the pregnancy is uncomplicated, wait until pregnancy is 41 weeks. Instruct the woman to report if fetal movements are reduced.
- Vaginal examination should be carried out to assess whether the cervix is ripe or unripe (Bishop Score).
- Sweeping of membranes should be done during this examination as it decreases the frequency of post term pregnancy.

- **Once 41 weeks are completed, refer her to FRU** for further evaluation and interventions (fetal surveillance tests, induction of labor etc.)
- Assess gestational age accurately to avoid delivery of a preterm baby. Calculation by date of LMP is likely to be wrong if the woman had prior irregular menstrual cycles or if she has conceived soon after cessation of oral contraceptive pills. Review the early USG reports if any.
- Ask about fetal movements. There may be diminished fetal movements

In low-risk pregnancies routine induction of labor at 41 weeks gestation is associated with reduction in perinatal mortality. The risk of fetal distress from uteroplacental insufficiency can be reduced by induction of labor.Induction of laborcan be done by oral or vaginal misoprostol tablets or by oxytocin infusion and ARM.

During labor (Induced or spontaneous): Monitor FHR and color of liquor, watch for signs of fetal distress which is common due to cord compression resulting from oligohydramnios. Caesarean is done for fetal distress and for large baby.

Once 42 weeks are completed: Induction of labour is recommended. If the baby is too large or severely compromised, caesarean section is performed.

3.18.2 Role of health professionals:

ASHA/ANM: Pregnant women undelivered by their expected date of delivery should be referred to MO

MO PHC/RH: Conform pregnancy duration, Look for any complicating factors. Membrane sweeping to prevent post term pregnancy. Referral to specialist if any complicating factors, or if pregnancy has reached 41 weeks

Specialist at DH: Assessment and obstetric management as indicated

3.19. High Risk Pregnant Women: Detection & Line listing

Table 20: Check List at First Visit

Sl No	Risk Indicator	Action
1	Past H/O TB, Hypertension, Heart disease, Diabetes, Asthma, Epilepsy, H/O ongoing medications	Referral to specialist
2	H/O tobacco use/ Alcohol consumption	Cessation
3	Heavy work/unable to take rest	Extra rest
4	Age < 19 years	Risk awareness
5	Age > 35 years	Referral to specialist
6	BMI < 18.5	Diet intervention
7	BMI ≥ 30	Referral to specialist (BSL, TSH, etc.)
8	Prior second trimester abortion / preterm LBW / full term LBW baby	Referral to specialist
9	H/O Pre-eclampsia/Eclampsia/ APH	Referral to specialist
10	H/O stillbirth/neonatal death	Referral to specialist
11	H/O Caesarean section	Referral to specialist
12	H/O PPH/retained placenta	Referral to specialist

13	Hemoglobin < 7 gm/dl	Refer for IV iron sucrose
14	Blood group Rh negative	Husband's Rh, ICT
15	HIV positive	ART/PPTCT center
16	VDRL positive	Inj Benzathine penicillin/antibiotics
17	Post 75 gm glucose BSL ≥ 140 mg	MNT, Exercise,Repeat PP BSL after 2 weeks. Referral to specialist
18	TSH elevated	Referral to specialist, Levothyroxine
19	Twin pregnancy (USG diagnosed)	Referral to specialist

Table 21: Check List for Monitoring during Pregnancy

Risk Indicator	**Action**
H/O vomiting/ giddiness/headache/blurred vision/upper abdominal pain /generalized oedema	Check blood pressure, proteinuria. Referral to specialist. Administer Tab Nifedipine, Inj MgSO4 as indicated
BP ≥ 140/90 mm of Hg, Urine proteins ≥ +	Referral for Management of Pre-eclampsia
BP ≥ 160/110/ Severe Pre-eclampsia	Inj MgSO4, Nifedipine, Referral
Fits (Eclampsia)	Inj MgSO4, Nifedipine, Referral
Vaginal bleeding	Referral to specialist
Preterm labour 24 to 34 weeks	Inj Dexamethasone, Referral
Preterm leaking (PPROM)	Tab erythromycin, Referral
Fever	Investigate for Malaria, Dengue, Pneumonia. Treatment as required
Urinary infection	Antibiotics
Vaginitis present	Treatment of infections
Weight gain < 1 Kg/month	Diet counseling
Icterus present	Referral to specialist
Fundal height < POA (> 2 weeks lag)	Referral to specialist (USG)
Reduced fetal movements	Referral to specialist
Breech/Transverse lie at 36 weeks	Referral to specialist. USG, NST
Pregnancy 41 weeks	Referral to FRU

Section 4. Peripartum Interventions

Majority of stillbirths and early neonatal deaths are due to intrapartum complications. These can be prevented by careful monitoring during labour and quality intrapartum care.

Basic and comprehensive emergency obstetric and neonatal care can save lives through timely instituted appropriate interventions. Some of these interventions can be provided by a skilled birth attendant at every delivery point.

The list of interventions includes the following:

1. Clean and safe delivery practices: Preventing sepsis in mother and newborn
2. Birth companion during labour and delivery and Respectful maternity care
3. Safe Childbirth Check list (SCC)
4. Care during uncomplicated labour and immediate postnatal period .Monitoing labour with partograph: Detecting slow progress, Detecting fetal distress;
    - Active management of third stage of labour (AMTSL),
    - Late clamping of umbilical cord
    - Fourth stage observations
5. Preventing birth asphyxia
6. Detecting, treating PPH
7. Detecting, treating puerperal sepsis
8. Some facts: MMR, NMR

4.1 Clean and Safe Delivery Practices

Preventing Sepsis in Mother and Newborn

Infection during labour can result in sepsis in mother and newborn baby.

4. 1.1 Risk Factors

- Unclean delivery
- Repeated vaginal examinations during labour
- Prolonged labour
- PROM (Risk increased if time interval between the rupture of membranes and the childbirth long)

- Anemia, under nutrition, Diabetes Mellitus, HIV infection

During childbirth small abrasions and tears occur in the birth passage. After the separation of placenta a large raw area is left in the uterine cavity which takes around 2-3 weeks for healing. This gives a chance for the disease producing microbes to enter the woman's body and cause infection. There is possibility of introduction of sepsis from the other unclean surfaces, and use of improperly disinfected instruments and material. Baby also has a raw area at the cut end of the umbilical cord which can easily get infected if it comes in contact with microbes.

4.1.2 Cleans : These infections in mother and baby can be sometimes very serious and cause death or severe illness.It is therefore necessary to follow clean delivery practices during conduct of delivery and after the childbirth.

- Clean hands: During internal vaginal examinations and while conducting the delivery the hands should be washed with soap and water and sterile gloves should be worn.
- Clean perineum : While conducting delivery, clean the vulva and perineum with a swab soaked in antiseptic solution, from front to back and discard the swab. Use another swab for cleaning again
- Clean delivery surface: The mother should deliver on a clean surface on which a clean sheet is placed.
- Clean cord tying: For tying the umbilical cord clean thread should be used. The cord clamps are safe.
- Clean cord cutting : The cord should be cut only by a disinfected scissors or by a sterile blade
- Clean cord: The stump of umbilical cord should be kept clean and dry. Nothing should be applied to the stump and it should be kept open.

4.1.3 Prevention

- Strict aseptic measures during conduction of labour
- Minimum number of vaginal examinations
- Early delivery in PROM cases
- Prophylactic antibiotics: If membranes ruptured > 18 hours before delivery with labour pains, ROM > 12 hours if no labour pains, preterm PROM cases, caesarean delivery
- Avoid unnecessary suctioning of mouth and throat of baby

4.2 Birth Companion and Respectful Maternity Care

Almost all hospitals do not allow any relative of the pregnant woman to be with her once she is admitted in labour ward. There is thus no support available to women from someone whom they know.

4.2.1 Benefits :Studies have shown that compared with usual care, the provision of continuous support to women during labour by allowing a woman to be comforted, reassured and praised during childbirth with the help of a birth companion has many benefits which include

- Shorter duration of labour
- Less pain medication
- Fewer medical procedures
- Decreased rates of caesarean section
- Less babies are asphyxiated at birth
- Increased satisfaction with birthing experience

- Less postpartum depression.
- Early initiation and continuation of breast feeding.

4.2.2 The birth companion should be:

- Female
- Should have had delivered herself
- Agree to wear clean clothes, an identification tag and to attend the whole labour
- Agree not to interfere in the work of the hospital staff and the treatment procedures or with any other woman undergoing labour in the same ward
- Be free of communicable diseases.
- Identified during pregnancy

4.2.3 Role of Birth Companion *:*

- Providing emotional support to mother during labour, help her to move around as she desires, give her light snacks and liquids, talk to her and provide comfort in the form of back massage, warm compresses, playing music etc.
- Provide support in basic care activities like early initiation of breast feeding , keeping the baby covered etc
- Early identification of danger signs: Explain the signs and symptoms that she needs to observe and report immediately to the staff.

Counsel the birth companion regarding the following

Danger Signs for Mother	**Danger Signs for Baby**	**Counseling advice**
Excessive bleeding	Fast/ Difficulty in breathing	Support to cope up with labour pains
Severe abdominal pain	Fever unusually cold	No bath/oil for baby
Difficulty in breathing	Stops feeding well	No prelacteal feed
Severe headache/ Blurring of vision	Less activity than normal	Initiate breast feeding in half an hour
Urge to push	Whole body becomes yellow	Clothe and wrap the baby
Inability to pass urine		
Fever/chills		
Foul smelling vaginal discharge		

A brief orientation of identified birth companions should be conducted at the delivery point, preferably at the delivery place identified by the family.

- Explain the procedures of labour management to her in simple language.
- Explain her role
- What additional tasks she can do as a member of labour management team

4. 2.4 Respectful Maternity Care

For optimal maternal and newborn outcome, every pregnant woman needs to have institutional delivery attended by skilled birth attendant. For women to seek institutional birth, the delivery points need to be women friendly offering respectful maternity care.
All staff working in labour room, wards and ANC/PNC clinics should provide humane & dignified treatment to women during their pregnancy, delivery and postpartum period, respect their rights and choices and maintain supportive communication during labor.

The health facility should display a poster about the universal rights of the childbearing women at a prominent place to create awareness among the community.

- The staff must be aware of these rights, should know the types of Disrespect & Abuse (D&A), causes of D & A and the violation of rights resulting from the disrespectful behaviour.
- The staff should be able to identify D & A occurring in their facility and prevent reoccurrence of such incidents

4.2.4.1 Categories of Disrespect *and Abuse*

Category of disrespect and Abuse	**Corresponding Right**
Physical Abuse	Freedom from harm and ill treatment
No-consented care	Right to information, informed consent &refusal,respect for choices & preferences, companionship during maternity care
Non-confidential care	Confidentiality, privacy
Non-dignified care(Including verbal abuse)	Communication with dignity and respect
Discrimination base on specific attributes	Equality, freedom from discrimination, equitable care
Abandonment or denial of care	Right to timely health care and to the highest attainable level of health
Detention in facilities	Liberty, autonomy,self determination, freedom from coercion

4.2.4.1 Provision of respectful Care

During labour ensure the following :

Adequate visual privacy

Using screen, partition, on the three sides of the delivery table and curtains at the windows.

Dignity and respect

When a pregnant woman and her relative arrive at the labour room, the midwife should

- Attend the woman immediately, welcome her and encourage her companion to be with her.
- Behave in a dignified and respectful manner with pregnant women and their relatives.
- Provide a separate bed/labour table for each woman. Give her hospital clothes which cover her properly.
- No physical abuse to any pregnant woman. No pinching, slapping, restraining, pushing on abdomen. No yelling, scolding, shouting, blaming. Do not use abusive language. Avoid unnecessary touching and examinations.
- Do not leave the woman unattended and be empathetic and attentive to her needs
- Give emotional support to the pregnant woman throughout labor. Provide pain relief of her choice
- Allow the woman to move around during first stage of labor and allow her to have any position of her choice except supine. Encourage her to have liquids and light snacks during labor and avoid getting exhausted unless medically not advisable.

- Drape the client before delivery, give episiotomy only when indicated and conduct delivery following six cleans

Privacy and Confidentiality

- Do not disclose the HIV status of the patient to others except the staff involved in her care. Do not make the HIV status obvious to others by writing on the case sheet, by placing a label or by allotting specific bed.
- Keep the case records at a designated place with limited access.
- Allow only the authorized persons in the labour room.

Equality and freedom from discrimination

- Do not discriminate any woman on account of any of her characteristics (religion, caste, socioeconomic status, language, educational level etc.)

Safety:

- Monitor the labor progress, maternal and fetal wellbeing and follow standard management protocols during conduct of labour following six cleans and avoiding unnecessary interventions in labour

Information about the medical condition, Informed decision making, Freedom of choice

- While conducting physical examination the staff should explain the purpose, the procedure and seek the client's permission verbally, encourage her to relax and cover her properly.
- Inform the examination findings in simple terms to the client and her companion and explain them the treatment plan and ask if they have any questions/concerns.
- Involve pregnant woman and her relative in the decision process. Respect the woman's choices, right to refuse any treatment. Do not force your decision on her.
- Take an informed consent on the case sheet on admission to labour ward (Voluntary seeking of care for delivery at this facility)
- Ensure taking written informed consent for the following
    - Before proceeding for any surgical intervention
    - Blood transfusion
    - Invasive procedures like epidural anaesthesia
    - Information about critical ill health
    - Admission of baby to SNCU
    - PPIUCD insertion

Companionship during maternity care (Birth companion)

The midwife should note the female birth companion, ensure that she is wearing clean clothes and is currently free of any infectious illness. She should provide her an identification tag and allow her to be with the client during labour. Explain the companion her role. Tell her that she is an important component of LR team.

Postnatal stay:

- Give her a clean bed with a clean bed sheet. Keep the mother and her baby together. Provide her fresh sanitary napkins as needed.

- Provide privacy during breast feeding and while giving kangaroo mother care (KMC)
- Check that support staff are attending to the needs of women and not demanding any gratuitous payments/gifts etc from the family
- At the time of discharge, get the feedback form filled by the client to note the satisfaction/dissatisfaction regarding any services, staff behaviour etc.
- Analyze the feed back forms and note the deficiencies in the quality of care, discuss these in quality circle meetings and take necessary actions to eliminate the gaps.

4. 3 Safe childbirth Check List (SCC)

4.3.1 Introduction : Check list is a tool which enables one to remember to perform all the essential actions one desires to perform in complex situations. Examples of checklists include 2 minutes 19 item surgical safety checklist, five-item checklist for central-line placement and Safe Childbirth Checklist (SCC). Safe childbirth check list has been adopted by GOI in public health facilities.

Labour process is complex, continues over many hours, has multiple stages, provider may change during the process, multiple actions need to be performed, all actions need to be performed at appropriate times e.g. Uterotonic should be given immediately after birth during third stage, Baby, if not breathing spontaneously, should be revived within 1 minute of delivery. Complications can occur any time and in any case even in an apparently normal low risk pregnant woman.

4.3.2 Safe childbirth check list is a tool focusing on essential practices for safe childbirth. It aims to help the service providers to know what essential activities need to be performed, know when these need to be performed and know how to perform these activities. The checklist is organized around 4 pause points/checks. The pause point is a time during the delivery process where the service provider can briefly stop and review the condition of the woman and the newborn baby, check whether he/she has performed all the essential activities for safe care, and prepare for safe care activities that need to be performed next .

Check 1 : At admission : This is the first contact of the mother. We can pause and review whether we have assessed mother properly, briefed the mother and companions about the process, and are prepared for her delivery in the facility

Check 2 ; Just before and during delivery : We can review our preparation for the delivery immediately before delivery, as we might not have time to look for necessary supplies when delivery is happening, “Golden Minute” for the Baby, look for PPH for mother

Check 3 : Soon after childbirth : The first hour after the delivery is important for both mother and babies . We can pause at this time to review that mother and baby are fine and ensure practices such as breast feeding and skin to skin contact (KMC)

Check 4 : At discharge: The mother and baby are leaving from the facility . This is an important time to pause and review their condition before discharge and give appropriate follow up advice

GOI recommends use of safe childbirth checklist for each delivery and encourage correct practices like appropriate use of drugs/antibiotics and proper following of clinical protocols.

It is expected that at each pause point the Health care provider (HCP) goes through the checklist to check whether all the activities indicated at that point time are performed and in the correct manner, tick appropriate responses in the checklist. Use the guidance given in the

checklist to perform activities. If any critical action is missed, to perform it, and then check appropriate response in the checklist.

SCC helps service providers remember key activities to perform timely and in a standardized way to improve quality of care during childbirth and immediate postpartum period.

Safe birth check list is attached in annexure.

4.4 Care during Uncomplicated Labour

A pregnant woman coming with pain in abdomen, mostly she has started labour pains.

4.4.1 At admission to LR, Make a correct diagnosis of onset of labour

Onset of Labour : Labour pains associated with uterine contractions and cervical change, which are progressively increasing

Ask her about the pains: Labour pains are intermittent, starting from back to front, pain coincides with hardening of uterus, intensity increases with time

Pain which is continuous, severe, associated with restlessness, fast pulse, pallor suspect abnormality such as accidental hemorrhage, uterine rupture which needs evaluation by a medical person and referral

LMP, EDD. Calculate duration of pregnancy in weeks + days

- If she has completed 37 weeks she is full term
- Between 34 weeks and 36 + 6 days : She is late preterm labour
- Between 24 weeks and 33 + 6 days she is in early preterm labour

Ask history of vaginal discharge and its duration:

- Blood stained mucoid discharge (Show): Sign of onset of labour
- Blood (Antepartum hemorrhage)
- Watery discharge: Rupture of membranes
- Foul smelling watery discharge: Infection of membranes (Chorioamnionitis)

Document detailed obstetric history, outcome of each previous pregnancy and history of complications if any. Family history, past history of any major illness, personal history

Check the antenatal record for

- BMI in first trimester, Weight gain during pregnancy
- Blood pressure records,
- Hemoglobin, blood group, HIV, VDRL, Urine test results
- Ultra sonography reports,
- Any other laboratory tests done,
- Receipt of tetanus immunizations,
- Medication records, IFA consumption, Calcium consumption

Conduct physical examination : Record pulse, blood pressure, respiration. Look for Pallor,icterus, odema, Auscultate chest

Conduct obstetric examination

- Make sure urinary bladder is empty. Assess fundal height. Note lie of the fetus, presentation, position, (GOI poster 1), presenting part palpable above the pubic symphysis in fifths to note whether it is engaged in the pelvis (Fig 7&8)
- Assess number of uterine contractions in 10 minutes, duration of each contraction in seconds and intensity
- Auscultate for 1 minute soon after the contraction passes off and record FHR

Fig 7 **Fig 8**

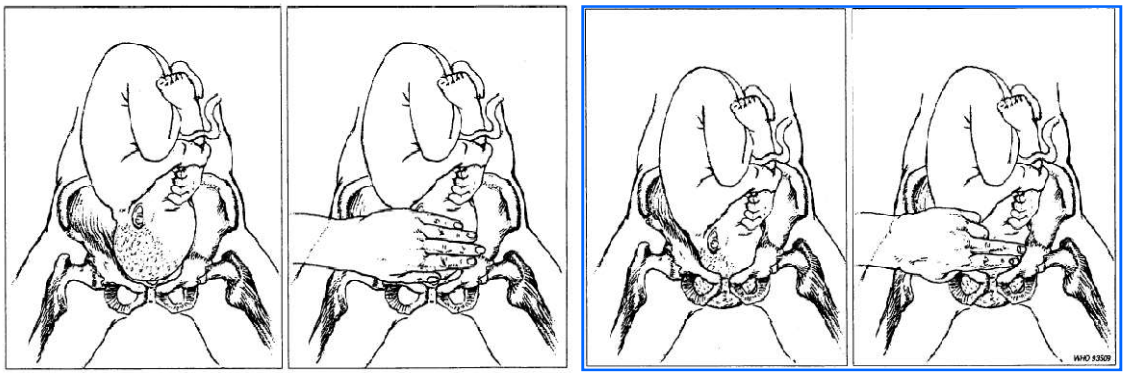


Fig 7: Head accomodates 5 fingers five fifths of the head above the brim.

Fig 8 : Head palpable 2 fingers (2/5th) or less is engaged head

Conduct vaginal examination with a gloved hand after explaining the pregnant woman and after hygienic hand wash and cleaning of vulval opening from before backwards.

- Note cervical dilatation and effacement,
- Membranes intact or ruptured, liquor color,
- Presenting part, its station in relation to ischial spines, position, attitude
- Assess shape and size of pelvis (Fig 9)

Check whether she has any signs indicating additional care at higher level of care and needs referral

Admission procedures not beneficial :

- Routine perineal shaving : No clinical benefit in terms of reducing peripartum infections . Discomfort after shaving, irritation, redness, vulval itching & burning sensation
- Administration of simple enema routinely is not recommended

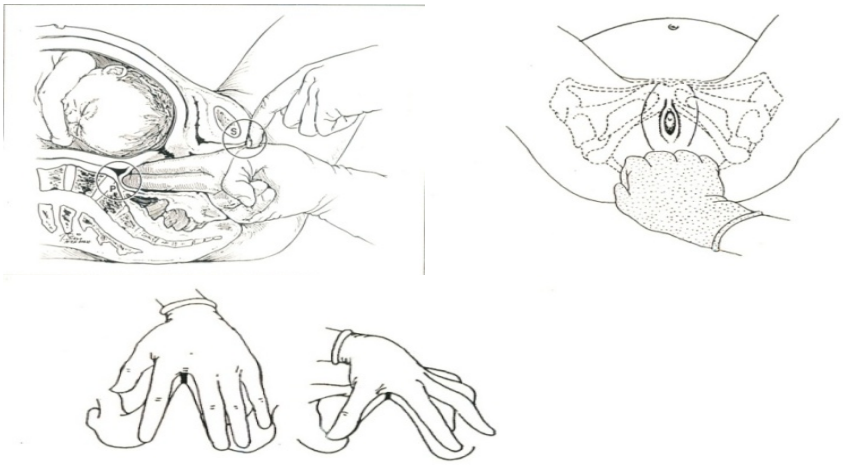


Fig 9 : Pelvic Assessment

Assessment of Pelvis	
Parameter	**Suspicious Pelvis**
Sacral Promontory	Felt Very Easily
Diagonal conjugate	< 11.5 Cms
Sacrum	Flat
Lateral Pelvic Walls	Converging
Ischial Spines	Both Can be Palpated Simultaneously
Sub-pubic Angle	Acute
Inter-tuberous Diameter	Four Knuckles Cannot be Accommodated

Make a Diagnosis : Gravida(G), Para(P) ; weeks of pregnancy, in latent/active phase of labour (note the abnormality if any)

Record the identification data and initial observations on labour case record, safe childbirth check list and simplified partograph as indicated

Safe Child birth Check List : Record the findings at admission on the Safe childbirth check list (page 1) (CHECK-1) and administer the necessary interventions as indicated.

4.4.2 Care during First Stage of labour

Find whether she is in Latent phase (Cervical dilatation upto 4 cm) or Active phase of first stage (cervix ≥ 4 cm dilated). Observe the following:

- Record maternal pulse and Uterine contractions every 30 minutes
- FHR every 30 minutes by intermittent auscultation
- Perform vaginal examination 4 hourly.
- Note time of rupture of membranes and note the color of liquor
- Record blood pressure and note passage of urine every 4 hours
- Allow the woman to have liquids or light snacks
- Allow her to move around and take any position she is comfortable

- Allow her to have a birth companion of her choice
- Keep her informed about progress of labour
- Assess need for pain relief, encourage use of pain relief without medications (Massage, listening to music)
- Provide support and respectful communication respecting her privacy and dignity
- Record the observations on simplified partograph (Fig 10)

4.4.2.1 Partographic Monitoring of Labour

- The partograph recording is initiated when the cervix is 4 cm dilated
- Record the dilatation in cm (symbol x) on the alert line and record the time at which observation has been made on the horizontal axis below this point.
- Plot all other observations on this vertical line against the time. Write the time in subsequent squares below the hours.
- Thereafter record the observations on the partograph at respective time
- Perform vaginal examination every 4 hours and note the cervical dilatation and mark it on the graph. Join the points and note the cervical dilatation progress whether it is to the left of alert line, on the alert line or has crossed the alert line.

4.4.2.2 Detecting slow progress

- When the line of progression in cervical dilatation lies on the left side of alert line, it indicates satisfactory progress.
- If the line falls on the right side of alert line, it indicates slow progress and requires careful monitoring to note the progress. At sub centre and PHC the arrangements for referral to FRU are indicated.
- If the progress reaches or crosses the action line, careful review of the case is necessary to find the cause for delay followed by appropriate interventions.
- The causes of slow progress include, weak uterine contractions, occipito posterior position, deflexed head, CPD etc
- In case of slow progress, if vertex is engaged and cervix is well applied to the vertex then at FRU artificial rupture of membranes (ARM) can be performed to hasten the progress.After ARM progress is reviewed. If progress is still slow and if uterine contractions are infrequent and weak then oxytocin augmentation can be considered after excluding contraindications. If there is no progress after augmentation or if signs of fetal distress develop, an emergency caesarean section might be required.

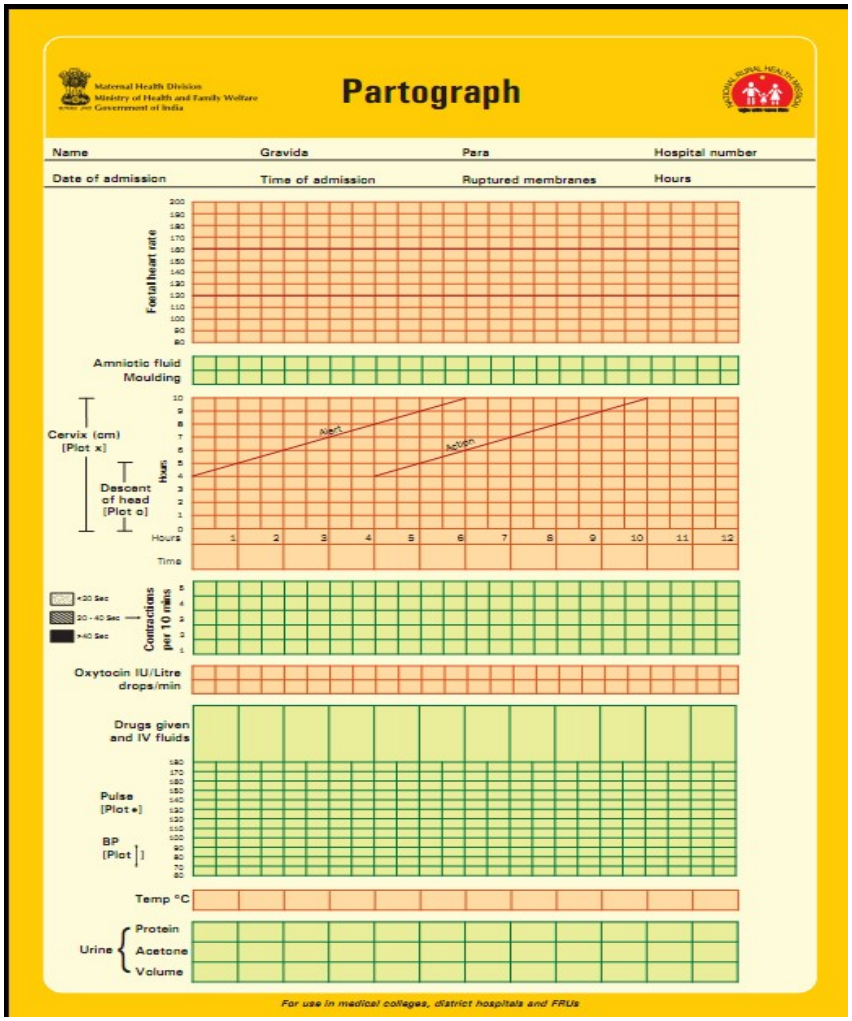


Fig 10 Simplified Partograph

Alert Signals

- FHR < 120 or > 160 minute for 15 minutes
- Meconium stained liquor
- Cervical dilatation progress line crosses the Alert line on partograph
- Any other abnormality developing

4.4.3 Recognize Imminent Delivery & Get Ready

- Vaginal examination reveals full dilatation of cervix, Membranes rupture
- Scalp seen at the vulva
- Pregnant woman gets an urge to push, starts pushing the baby with active efforts and gets a sensation to defecate. Perineum bulges, anus gapes
- Start radiant warmer 30 min before expected time of childbirth.
- Get delivery tray with prefilled syringe containing 10 IU Oxytocin
- Get ready to conduct delivery. Wear gown, mask, shoes
- Wash hands thoroughly, Wear gloves in both hands

Safe Child birth Check List : Record the findings at **CHECK -2**. **Just Before and During Birthon safe childbirth check list**(Page 2) Administer the necessary interventions as indicated.

4.4.3.1 Conduct delivery

- Clean the vulva with cotton swabs soaked in antiseptic solution from before backwards and discard the swab
- Ask the woman to bear down only during the uterine contraction
- Allow her to adopt position of her choice except supine or lithotomy
- Note the descent of head with each contraction
- Place two pre warm towels over the mother's lower abdomen
- Support the perineum with a sterile pad by right hand.
- Maintain flexion of head by pressure on occiput with two fingers of left hand
- Deliver the head gently
- Look for loops of umbilical cord around neck. If tight loops are seen, cut the cord between two clamps and expedite delivery
- For delivery of posterior shoulder lift the baby's head in forward direction.
- Deliver the anterior shoulder by depressing the head towards the mother's back.
- Deliver the trunk of baby
- Call out time of birth and show the sex of baby to woman
- Place the baby on the towel. Dry it . Discard the wet towel.
- Wrap the baby in second warm towel. Cover the baby's head with a cap .
- Note whether the baby is breathing. Place an identification tag
- Place the baby on mother's abdomen for early skin to skin contact with the mother.
- Proceed with active management of third stage of labour

Support the mother and baby in this position for about 1 hour until the baby gets the first colostrum feed. Engage the birth companion to support the mother and baby in this position

4.4.4 Active Management of Third Stage of Labour (AMTSL)

After the birth of the baby placenta starts getting separated and is expelled spontaneously in about 10-15 minutes. Uterus does not contract until the placenta is out completely. There is some amount of bleeding from the uterus during this process. This bleeding can be excessive (PPH) if it takes longer time to separate and expel the placenta. It has been shown that the process of separation and expulsion of placenta can be shortened by following certain steps resulting in significant reduction in the blood loss. This type of management is called as AMTSL. It has been proved that the AMTSL reduces the amount of blood loss during labour, reduces the chance of having atonic PPH and requirement of blood transfusion significantly thereby helping to reduce maternal mortality due to severe PPH.

AMTSL is now an integral part of skilled attendance at birth and is mandatory for all deliveries. The steps are as follows:

- After the childbirth, exclude presence of another baby by abdominal palpation
- Give IM inj 10 IU oxytocin in anterolateral thigh immediately (Within 1 minute of childbirth). When this is not possible, tablet misoprostol 600 mcg (3 tablets of 200 mcg each) may be given orally.

- **Delayed Cord Clamping :** If the baby is breathing normally, Check the pulsations of the umbilical cord. Clamp the cord with two clamps when pulsations stop and cut it with scissors. Generally pulsations stop after 1-3 minutes, hence clamping the cord after 2-3 minutes of birth is safe. This delayed cord clamping is beneficial for the baby as baby gets additional blood from the placenta until the cord is pulsating. This has been shown to have increased hemoglobin level and iron stores in the baby at the age of 6 months. This is greatly helpful for a preterm neonate.
  Early clamping of cord is necessary only when the baby does not start breathing soon after birth and requires to be shifted to newborn care corner (NBCC) for active resuscitation.
- Place the hand on uterus and note whether it has become hard
- When the uterus is well contracted, give gentle downward traction on cord with right hand during contraction while giving counter traction by other hand pushing the uterus upwards towards umbilicus (Fig 11). If the placenta does not descend during this contraction , as it is still not yet separated , wait for next uterine contraction. Repeat this during contraction as required. This is delivery of placenta by controlled cord traction (CCT)
- Keep the placenta in a kidney tray. Record the time of delivery of placenta
- Give uterine massage in a circular movement of hand until it contracts firmly
- Note the amount of bleeding. Use of Kelly's pad (Fig13) is useful in measuring the blood loss. The pictorial guide can also give idea about blood loss (Fig12) .
- Examine the placenta carefully for completeness: Maternal and fetal surface, membranes, cut end of the umbilical cord

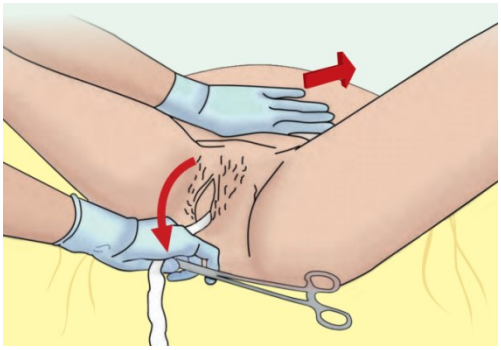


Fig 11 : Controlled Cord Traction

Alert Signals:

- Placenta undelivered at 30 minutes after childbirth
- Excessive vaginal bleeding , estimated > 500 ml
- Maternal tachycardia, hypotension

4.4.5 Observe during Fourth Stage

- Observe the vital parameters of mother and baby for a period of two hours after delivery. Every 15 minutes in first hour and every 30 minutes during second hour
- Note maternal pulse, respiration, blood pressure, pallor, alertness, uterine tone, vaginal bleeding

Alert Signals :

- Excessive vaginal bleeding
- Uterus soft, rising above the level of umbilicus
- Pulse 100/min or more
- Respiratory rate 30 or more
- Systolic Blood pressure <100 mm Hg
- C/O giddiness, Not passing urine

Safe Child birth Check List : Record the findings at **CHECK -3**, Soon After Birth (Within 1 hour) **,** on safe childbirth check list (Page 3) and administer the necessary interventions.

If mother and baby are fine, shift the mother and baby to the room/ward. Keep them together. Note the date and time of shifting to postnatal ward.

4.4.6 Observe the mother and her baby during the Postnatal stay

Observe the vital parameters of the mother every 6 hours for first 24 hours after childbirth and 12 hourly (Morning/Evening) thereafter until discharged home. Record the findings as in the chart

Assessment of Postpartum Condition								
		6 hrs	12 hrs	18 hrs	24 hrs	Day2 Morning	Day 2 Evening	Day3
Mother	BP							
	Pulse							
	Temp							
	Breast soft/engorged							
	Uterus soft/hard/tender							
	Perineal wound healthy/infected							
	Vaginal bleeding Normal/excessive							
Baby	Respiration							
	Temp							
	Sucking							
	Activity							
	Umbilical stump							
	Jaundice							
	Passed urine							
	Passed meconium							

Safe Child birth Check List : When the mother and baby are discharged from the facilityRecord the findings at **CHECK -4**, **Before Discharge**) **,** on safe childbirth check list (Page 4) and administer the necessary interventions as indicated. Discuss family planning methods with the couple. Explain the danger signs to the mother and her family and explain her when to report immediately to the facility. Inform her that ASHA will be making a home visit on 7 occasions during the next 6 weeks.

4.5 Preventing Birth Asphyxia

During labour, fetal hypoxia may result in birth of an asphyxiated baby which if not actively resuscitated can result in neonatal death. A baby having severe birth asphyxia can suffer long term disability.

Detecting foetal distress during labour is important as it indicates the need for early delivery. In first stage of labour caesarean section is required for early delivery. In second stage episiotomy and assisted instrumental delivery can be performed in selected cases.

Timely referral to functional FRU is essential for early interventions. Inform the FRU telephonically about such referral in order to remain in readiness. Note pre-referal treatment and important medication and condition of mother and foetus if any on referal slip.

4.5.1 Fetal distress is more common in following women

- Women who are having hypertension, Pre-eclampsia, APH
- Baby which has intrauterine growth restriction (IUGR)
- Pregnancy more than 41 weeks (past-dated pregnancy)
- Premature rupture of membranes (PROM)
- Inappropriate use of oxytocic drugs for hastening delivery can lead to excessive uterine activity and fetal distress.
- Prolonged labour, obstructed labour, uterine rupture
- Breech delivery and other abnormal fetal presentations
- Cord prolapse can result in sudden severe fetal distress.
- Caesarean section scar may rupture giving rise to sudden fetal distress

However fetal distress can occur in apparently uncomplicated labour due to short umbilical cord, true knotting of cord, sudden placental separation etc. Hence FHR must be monitored vigilantly and recorded on the delivery record.

4.5.2 Detecting Fetal Distress :

During normal labour foetal heart rate (FHR) needs to be monitored every 30 minutes in first stage and every 15 minutes during second stage of labour. Normal FHR is 120-160 beats /min, regular. FHR should be heard soon after the uterine contraction has ended. Sometimes there is drop in FHR at the end of uterine contraction and there is gradual recovery in next few seconds. Such drop generally precedes fetal distress and can be a warning signal.

Fetal distress : FHR < 120/minute, > 160/minute , meconium stained liquor

4.5.3 For reducing chances of fetal distress following actions are necessary.

Referral of high risk pregnant women to FRU for delivery

- Women having severe Pre-eclampsia, APH, severe fetal growth restriction
- Women having breech presentation, transverse lie, twin gestation at 36 weeks
- Women who have completed 41 weeks
- Women having premature rupture of membranes and no labour pains
- Previous history of caesarean delivery

- During labour, refer women having presentation other than vertex to FRU taking care to preserve membranes intact during examination.

Maternal mobility and position : Allow the woman who does not have any complicating factor to move around during first stage of labour. Allow her to have any position of her choice except supine. Walking, standing against a wall, sitting increase the dimensions of her birth passage (Pelvic diameters) which helps in progressive descent of the presenting part. Gravity also helps descent of fetal head in these positions. Uterine contractions become stronger during non supine positions.

During supine position there is pressure of the large uterus on the large vessels which reduces the blood flow in the placental circulation and can cause fetal distress. Explain the mother that mobility during first stage of labour is good for her baby.

Avoid unnecessary interventions: Do not rupture the membranes unnecessarily. After rupture of membranes there is increased chance of abnormal FHR patterns.

Do not start oxytocin infusion in normally progressing labour just to hasten the delivery. Excessive uterine contractions caused by oxytocin with inadequate relaxation of the uterus following a contraction can reduce the placental circulation and lead to fetal distress.

Oxytocin infusion for weak uterine contractions requires careful selection of case and vigilant monitoring of FHR every 15 minutes by being next to the woman until she delivers. Also facility for performing caesarean section and assisted delivery has to be ready for quick delivery when needed.

Partographic monitoring facilitates early detection of slow progress and prevents prolonged labour by facilitating timely interventions thereby reducing the chances of fetal distress.

Second stage : Help the mother not to get exhausted by giving liquids and light snacks during labour, support, and by telling her to push only when she gets urge to push and only when her uterus contracts. Keep listening to FHR every 5 minutes. Avoid undue delay in second stage of labour.

4.6 Detecting, Managing Postpartum Haemorrhage

4.6.1 Definitions:

- Excessive vaginal bleeding > 500 ml after delivery. It can be primary within 24 hours of delivery or secondary after 24 hours till 42 days after delivery.
- Even moderate amount of bleeding can have serious consequences in women having anaemia, Pre-eclampsia or low BMI.

Types: Immediate (Primary) PPH: Within first 24 hours after child birth.

Delayed (Secondary) PPH: After 24 hours up to 42 days after child birth.

4.6.2 Causes of PPH (4 T) : poor **Tone** of uterus which is commonest, genital **Trauma**, retained **Tissue -** placenta/lobe in the uterus, coagulation problems (**Thrombin)**

- Atonic PPH is more common in cases of twin pregnancy, APH, grand multiparas, and women giving history of PPH in previous delivery. AMTSL prevents PPH in majority of women

- PPH is an unpredictable complication and can occur in any low risk pregnant woman. You need to be prepared to manage it at every delivery.
- Causes of delayed PPH : Retained products and sepsis

4.6.3 Diagnosis :

Diagnosis of Causes of Excessive Bleeding after Childbirth.

Clinical Presentation	Probable diagnosis
Uterus is flabby, not contracted, fundus is rising.	Atonic PPH
Uterus is well contracted. Speculum examination of cervix and vagina reveals cervical/vaginal lacerations/tears.	Traumatic PPH
Placenta not delivered within 30 minutes after delivery.	Retained placenta
Placenta incomplete, torn vessels in the membranes.	Retained lobe of placenta
Bleeding continues even after treatment. Blood does not clot for > 15 minutes.	Coagulation failure
Uterine fundus not felt per abdominally. Inverted uterus seen in vagina or outside vulva.	Acute Uterine Inversion
Delayed PPH. Uterus is larger for the postnatal day, soft, may be tender, bleeding may have foul smell.	Uterine infection, retained lobe/fragments of placenta,Sepsis

4.6.4 Readiness : PPH Box should be readily available with PPH management chart in it .

PPH Box

• 18 No. 2 intracath , Strap • Sterile syringe –10, 5, 2 ml • I.V. set 2 • I.V. fluids – 2 pint Inj. Ringer lactate. • Inj. normal saline 500ml • Folley's catheter 16 no., uro bag, syringe & distilled water for inflation • Tab. Misoprostol 200 mcg- 4 • Blood urine sample collection bulb • Sims speculum,sponge holders, suture material scissors	• Sterile gloves , long elbow length sterile gloves • Sterile sponge – 3 • Sanitary Napkin (2) • Alcohol swabs, dry swabs, • Adhesive tape • Antiseptic solution • Condom – 2 , Sterile linen, Foley catheter, IV set, Normal saline 500 ml • Management chart

*List of items kept in refrigerator :*Inj Oxytocin – 6 ampoules, Inj Methyl ergometrine 2 ampoules, Inj. carboprost (15 methyl PG F2α)- 2 ampoules

4.6.5 PPH Management

Assessment of Blood Loss (Table 22)

- Recognize PPH by correctly assessing the blood loss after childbirth. Kelly's pad, pictorial chart, (Fig-12) Monitoring uterine tone and vitals help in accurate assessment.
- Until the woman loses upto 1000 ml of blood her pulse rate, BP, general condition can appear as normal
- When pulse is 100 beats/min and BP is normal the blood loss can be 1200 ml or more
- When pulse rate is 120/min , systolic BP is 80 mm Hg or less, woman is pale, cold, restless and agitated : Blood loss is 1800 – 2000 ml

Action

- Call for help. Call ambulance, Arrange transportation to FRU.
- Palpate uterus. If it is soft, flabby it is atonic PPH. Give uterine massage
- Start 2 IV lines by No 18 G cannula. Start IV Ringer lactate or normal saline with 20 I.U oxytocin 40-60 drops /minute
- Introduce foley catheter in urinary bladder.
- Start another drip and give RL/NS. If the woman is in shock, Give one litre RL/NS in 20 min by. Give oxygen.
- If uterus is still soft, give Inj. 0.2 mg. Methyl ergometrine deep I.M.: If uterus is still soft after 15 min, repeat Inj. Methyl ergometrine 0.2 mg IM
- At PHC MO can give IM carboprost 250 mcg , can repeat after 15 minutes.
- Can give Misoprostol 4 tab (800 mcg) sublingually / rectally. (Table 23)
- Until transfer and during transit, Continue oxytocin drip , IV fluids, uterine massage Bimanual compression (Fig 14) , external aortic compression (Fig 15). (get help of ASHA/ relative)
- Repeat the dose of oxytocic drug as indicated in the table to keep the uterus well contracted
- At PHC MO can attempt uterineballon tamponade (Fig 16) while the arrangements for referral are ongoing. Uterine Temponade with a sterile condom is a simple procedure which can be carried out by any SBA as a life saving measure before referral. After putting the patient in the lithotomy position, under aseptic precautions, a sterile rubber catheter is inserted within the condom and tied near the mouth of the condom by a silk thread and introduced in the uterine cavity. The condom is inflated with 300-500 ml normal saline. The condom catheter is kept for 12-24 hours. It is gradually deflated when bleeding is controlled. Uterine contraction is maintained by oxytocin drip for at least 6 hours after the procedure. Antibiotic cover is given. If bleeding does not stop in 15 minutes prepare for surgical intervention.
  While transferring a patient who is in a state of shock to a well equippedcentre, if available, non pneumatic Anti - shock Garment (Fig 17) can be used

General Care :

- Wash hands and wear surgical gloves. Insert Foley's catheter and monitor hourly urine output. Urine output less than 20 ml /hour indicates poor perfusion of tissues.
- Send blood sample for cross matching of 3-4 units of blood
- Send blood sample to laboratory for full blood count, coagulation profile, baseline urea and electrolytes.
- Oxygen is given by face mask: 8 L/min . Keep the woman warm. Elevate the legs.

- Monitor woman's GC, pulse, blood pressure, respiratory rate, temperature every 15 minutes. Note pallor. Assess the amount of bleeding. Look for signs of shock.
- Inspect placenta if she is recently delivered.
- Auscultate lung bases frequently to rule out pulmonary edema.
- Monitor vitals closely every 10 minutes for 30 minutes, every 15 min for next 30 mins, and every 30 min for next 3-6 hours or until stable. Continue oxytocin infusion.(max 100 IU in 24 hours)
- If the bleeding does not stop, explore uterine cavity for retained placental bits/lobe.
- If the uterus is hard, explore the lower genital tract in good light to look for genital trauma and repair any tears followed by firm packing of vagina to stop the oozing from lacerations.
- If the blood sample fails to clot, reversal of coagulation defects needs to be achieved by administering blood and blood products. Execute urgent referral to higher facility.
- Arrange urgent referral to FRU, with accompanying HCW and relatives. Continue oxytocin infusion & oxygen during transit.
- If the woman is in shock manage shock. The first drip should be fast and timed for approximately 1 litre in 20 min. Estimated replacement is usually 3 times the blood loss. Attempt compressing the abdominal aorta by firm pressure with a closed fist just above the umbilicus during transit (Fig 15).
- If it is delayed PPH,look for signs of infection and administer the first dose of antibiotic.

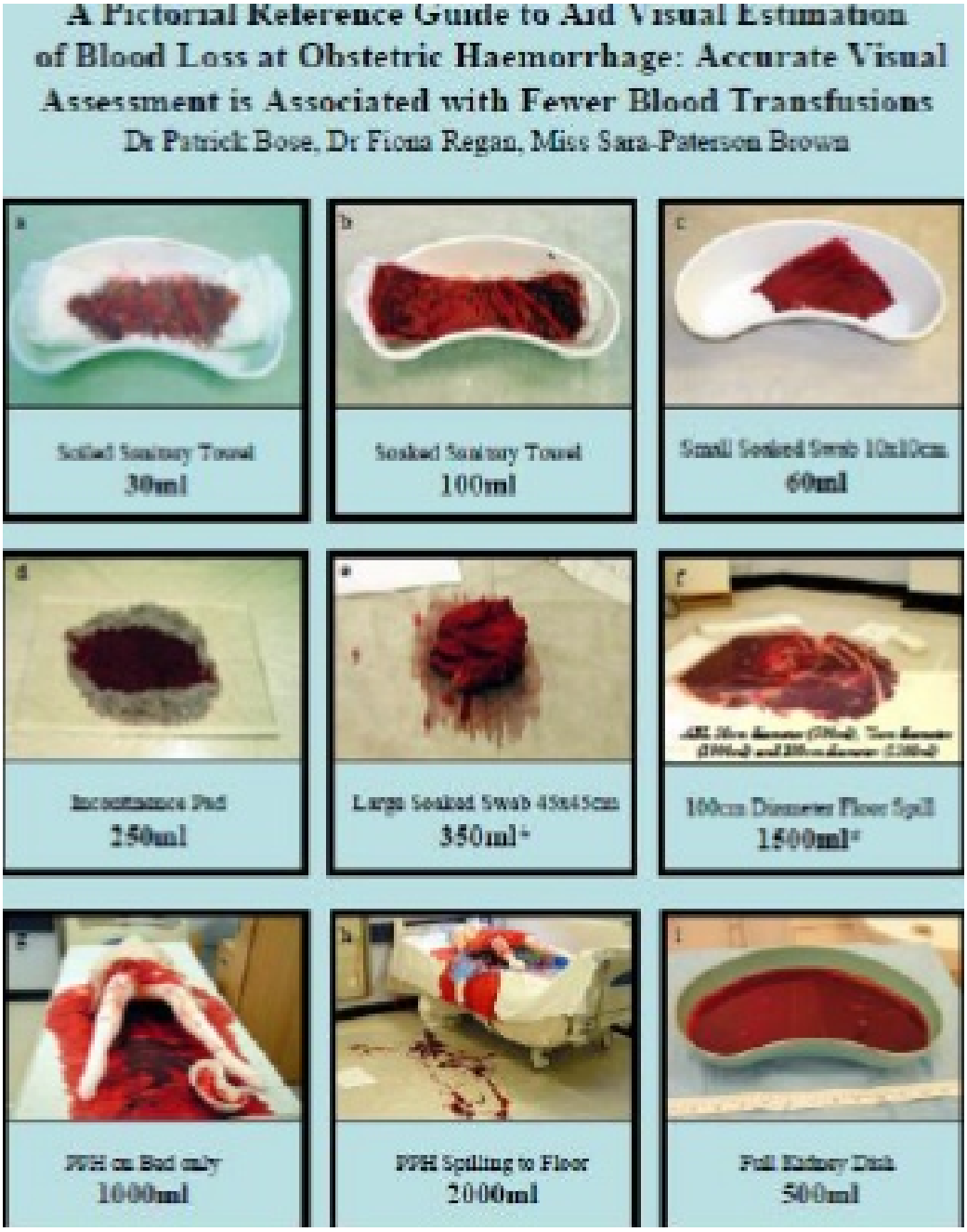


Fig 12 : Pictorial guide for assessing the blood loss

Fig 13 : Kelley's Pad

Table 22 : Clinical Assessment of Blood Loss and Shock

Signs	Class I	Class II	Class III	Class IV
Blood loss (mL)	500-1000 (15%)	1200-1500 (20-25%)	1800-2100 (30-35%)	>2400, (40%)
Pulse/min	Normal	100	120	140
Systolic BP	Normal	Normal	70-80 mm Hg	60 mm Hg
Tissue Perfusion	No symptoms or signs		Pallor, rapid respiration, restlessness, oliguria, cold skin	Collapse, anuria, Rapid RR (air hunger), cold skin
Mental status	Normal		Agitated response	Confused, agitated, aggressive
Initially give 1 lt in 20 min and decide further fluid requirement based on vital parameters				

Table 23 : Drugs for Atonic PPH

Drug	Dose and route	Continue dose	Max dose	Precaution & contraindication
Oxytocin	20IU in 1000ml RL/DNS 60 drops/ min IV infusion	IV infuse 20 IU in 1000ml RL/DNS 40 drops/min IV infusion	Not more than 3L of IV fluids containing Oxytocin	Do not give IV as bolus
Methyl Ergometrine	IM or IV (slowly) 0.2 mg	Repeat 0.2. mg after 15 min. If required give 0.2 mg IM/IV slowly every 4 hrs	Five dose (Total 1.0mg)	High BP, PE, Heart disease
15- Methyl PG F2-alpha (Carboprost)	IM 0.25 mg	0.25 mg every 15 min	8 doses (total 2mg)	Asthma
Misoprostol	800 micrograms PR/sublingual	Single dose	Single dose	-

Mechanical Methods to Control Atonic PPH

Bimanual Uterine Compression

- Empty urinary bladder with Foley's catheter
- Insert gloved hand in the vagina
- Place fist in the anterior vaginal fornix and press against posterior wall of uterus
- Maintan compression until bleeding is controlled and uterus contracts

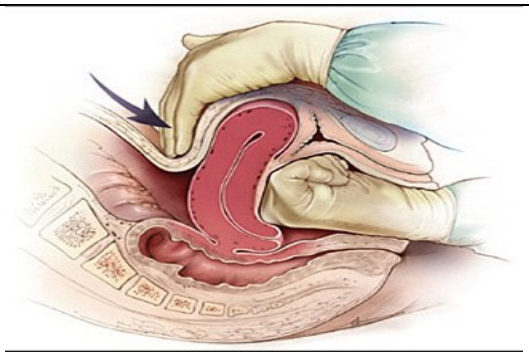


Fig 14: Bimanual Uterine Compression

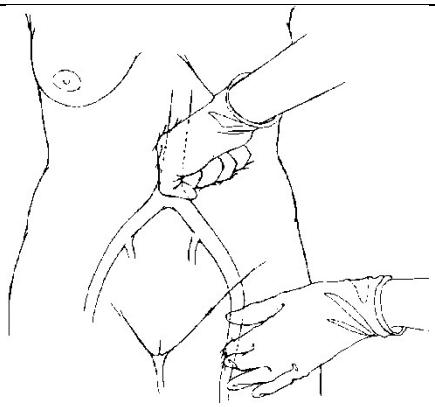


Fig 15 : External Aortic Compression

External Aortic Compression

- Apply downward pressure with closed fist over abdominal aorta directly through the abdominal wall
- With other hand palpate femoral pulse to check adequacy of compression (pulse not palpable indicates adequate compression)
- Maintain compression until bleeding is controlled
- Also EAC is important during transfer of patient

Balloon Tamponade

- Ensure that the bladder is empty.
- Hold cervix with a ring forceps.
- Place a Sims speculum in posterior vaginal wall.
- Insert catheter with condom tied onto the end (tied using sterile suture), into the vagina.
- Holding cervix with forceps, push condom further into uterus**.**
- Connect open end of catheter to IV set attached to infusion bag & inflate with 300 to 500 ml saline.
- Clamp catheter after inflating.
- Maintain in-situ for 12 to 24 hours.
- Keep bladder empty by indwelling Foley's, put on woman on prophylactic antibiotics.
- Monitor the patient closely**.**

Fig 16 : Condom Tamponade

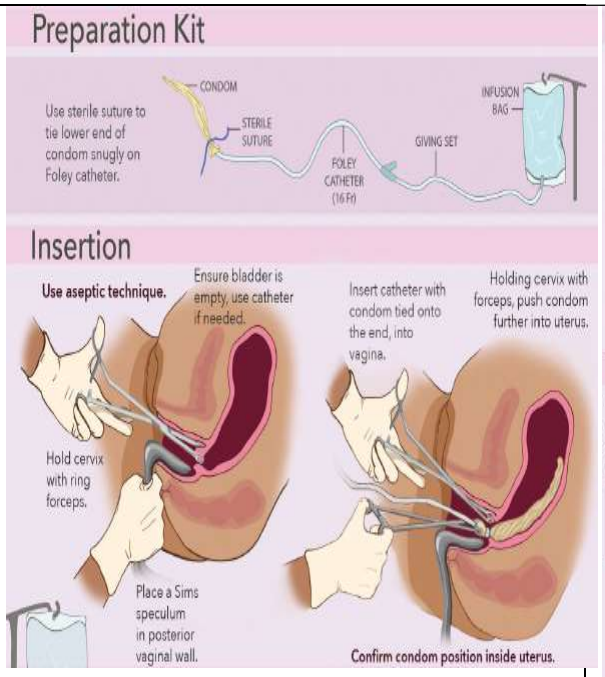


Fig. 16. Uterine balloon tamponade

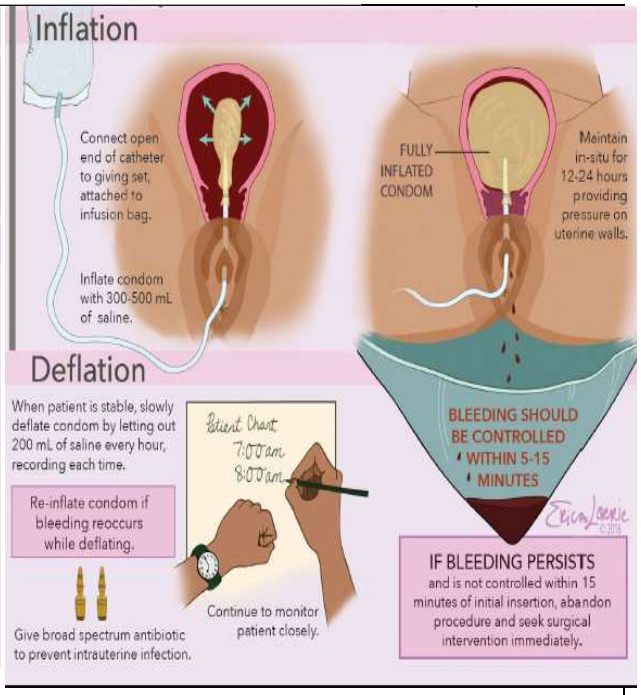


Fig 17: Non-pneumatic Anti - shock Garment

- Non-pneumatic anti shock garment can be used during referral of a woman in hypovolemic shock. It shunts blood to vital organs . Provides stability up to 48 hrs.
- Made of Neoprene and Velcro. Expensive, FDA cleared medical device
- Easily and quickly applied in about 2 mins , Can be used by persons with minimal training. Within 2-5 minutes of application most patients with severe shock regain consciousness and vital signs begin to stabilize

4.7 Detecting , Treating Puerperal Sepsis

About 8% of maternal deaths are attributed to postabortal or postpartum sepsis. It is a preventable complication. Early detection and prompt treatment can save a lot of morbidity

4.7.1 Symptoms : Fever 38^0 C (100.40 F**),** Foul smelling lochia.

Malaise, headache, nausea, anorexia, vomitting

4.7.2 Causes of fever

- Puerperal sepsis
- Wound infection: Episiotomy, Caesarean section .
- Urinary tract infection
- Mastitis, breast abscess
- Thrombophlebitis, deep vein thrombosis
- Other conditions : Malaria, pneumonia, typhoid, HIV related infections

4.7.2 .1 Genital sepsis

- Signs :Fever, tachycardia, uterus is soft, tender, sub involuted (i.e. large for the day of puerperium), abdomen soft, non-tender.
- Perineal wound: oedematous, pus discharge, foul smelling lochia
- Look for other causes of fever. Ask history of urinary frequency, burning, urgency. Examine breasts, legs for swelling, calf tenderness

Treatment:

- At subcentre :Give first dose of antibiotics. Inj Gentamicin 80 mg IM; Cap Ampicillin 500 mg orally, Tab Metronidazole 400 mg orally.
- Refer her to PHC/RH

At PHC : Mild sepsis (Not very sick mother) :

- Cap Ampicillin/Amoxicillin orally 500 mg 6 hourly for 7 days,
- Tab Metronidazole 400 mg orally 3 times a day
- Inj Gentamicin 80 mg IM twice a day

Review after 48 hours. If response is seen, continue treatment for 7 days.

If no response or woman looks very sick :

- Inj. Ampicillin 1 gm IV 6 hourly.
- Inj Metronidazole 500 mg IV 8 hourly.
- Inj. Gentamicin 80 mg I.M twice a day.

After 48 hours if patient improves and resumes oral intake, cap Ampicillin and tab Metronidozole can be given orally.

If no response refer to DH for hospitalization and IV fluids, IV antibiotics

Any degree of puerperal sepsis when associated with severe anemia, there is risk of rapid deterioration. Hence refer such patient to a specialist at district hospital.

4.7.2 .2 Severe sepsis: Tachycardia, high fever, toxic appearance, Hypotension

Pelvic peritonitis : If P/A examination reveals tenderness in lower abdomen (iliac fossae) with or without distention and guarding, suspect pelvic peritonitis and refer to FRU after giving loading dose of antibiotics.

Inj. Ampicillin 1 gm IV, Inj. Gentamicin 80 mg IM, IV Metronidazole 500 mg.

This patient needs hospitalization and parenteral antibiotics for 7-10 days. Inj. Ampicillin 1 gm IV followed by 500 mg 6 hourly. Inj. Gentamicin 80 mg twice a day I.M. IV Metronidazole 500 mg 8 hourly. IV fluids are given.

After 48 hours if patient improves and resumes oral intake, Cap Ampicillin and Tab Metronidazole can be given orally.

Change in antibiotics as per results of antibiotic sensitivity testing is required if there is no response to treatment within 48 hours.

Generalized peritonitis or septicemia: If a patient of puerperal sepsis is looking very ill, febrile, restless, has marked tachycardia and has distention of abdomen, guarding, tenderness over abdomen, peristalsis is sluggish or absent then such patient is having generalized peritonitis. She may have septicemia. Refer her to tertiary care center, as she requires special care in critical care unit, higher antibiotics and may need surgical interventions. There is risk of death due to endotoxic shock, acute renal failure, DIC.

Investigations:

- Complete blood count with WBC total and differential count.
- USG for retained products, collection in pelvis.
- High vaginal and cervical swab – smear, culture sensitivity.
- Blood culture in seriously ill cases.

Antibiotics to Mother

Recommended	
Fever ≥ 38^0C	PROM without labour pains > 12 hours
Foul smelling vaginal discharge	PROM with labour pains > 18 hours
Lower abdominal tenderness	Preterm PROM (< 37 weeks)
Labour> 24 hours	MRP (Manual Removal of Plancenta)
Obstructed labour	Uterine balloon tamponade
Cesarean section	

Not recommended for

Uncomplicated labour, episiotomy, first/second degree tear repair,

Assisted instrumental delivery

Section 5. Maternal Nutrition

What does Maternal Nutrition mean: Women's nutrition before and during pregnancy and after pregnancy is critical for optimal child nutrition and well-being of women. Undernutrition in the womb owing to poor maternal under nutrition manifests as intrauterine growth retardation, prematurity, low birthweight (LBW).

Why maternal nutrition is important?

Maternal nutrition is a critical determinant of maternal health and the nutrition, health, and wellbeing of children.An undernourished mother is more likely to give birth to a low birth weight (LBW) infant, which increases that child's risk of wasting, stunting and child mortality and, later in life, their risk of non-communicable diseases such as diabetes and high blood pressure. Optimal maternal health and nutrition are also important for a woman's own ability to lead a healthy life. Pregnancy is a demanding physiological state, additional foods are required to improve weight gain in pregnancy (10-12 Kg) and for optimal birth weight of infants (2.5 Kg).

How to identify nutritionally at-risk pregnancy?

If a pregnant woman has any of the following traits, she is considered as at-risk pregnancy.

- Age: less than 20 years: It risks both mother and child; may resulting in preterm delivery, low birth weight (LBW) baby
- Height: less than 145 cm: The short stature of woman has increased incidence of obstructed labour and results in caesarean section; also results in short stature of the child in later life
- Weight: less than 45 kg: It increases risk of miscarriage, low birth weight baby and a malnourished child in later life
- BMI: less than 18.5 kg/m2 or more than equal to 25 kg/m2 (at less than 20 weeks of gestation):
- Gestational Weight Gain (GWG): less than 1 kg or 3 kg/month (after 1st trimester):

It suggests the intra uterine growth of the baby during pregnancy.

- Anemia; Hemoglobin status (Hb): less than 11 g/dL; (Mild – 10-10.9g/dL, Moderate – 7-9.9g/dL, Severe - <7g/dL): maternal anemia can lead to postpartum hemorrhage, premature birth, developmental delays in baby, intrauterine growth retardation, low iron stores in the baby and maternal death etc.

Actions to improve maternal nutrition?

Here are certain actions and practices that can be implemented to ensure better maternal nutritional status.

1. Appropriate gestational weight gain

- Pregnant women should be counselled to go for regular ANC visits for monitoring weight and get it registered on Mother Child Protection (MCP) Card.
- A woman should gain 10-12 kgs of weight from pregnancy till the birth of the child.

- Weight gain also shows the healthy growth of an unborn baby (foetus).
- Too little or too much weight gain is not healthy both for mother and her baby.
- Too much weight gain can also lead to pregnancy complications like gestational diabetes, preeclampsia and need for C-section delivery in mothers. While in babies it can lead to pre-term birth, baby being born significantly larger than average.
- The weight of pregnant woman should be monitored regularly at each VHND.

2. Counselling on food and diet diversity

- Counselling of all pregnant women and family members about healthy eating and keeping physically active during pregnancy should be done to stay healthy and to prevent excessive weight gain during pregnancy.
- Counsel pregnant women to eat one extra meal a day during pregnancy and to consume a diverse diet that may include milk and dairy products, fresh/seasonal fruits and vegetables, cereals, whole grains and pulses, green leafy vegetables, a handful of nuts and daal. Non-vegetarians can include meat, egg, chicken or fish also. Advise them to include local seasonal foods, vegetables, and fruits in the diet. Counsel them to consume foods from different food groups as mentioned below:

Food Groups
1. Grains, white roots and tubers, and plantains (example rice, chapati, bread, millets, corn, sorghum, potato, sweet potato, unripe banana, lotus stem, turnip, Water chestnut)
2. Pulses (example beans, peas and lentils)
3. Nuts and seeds (example almond, chestnut, pistachio walnut, peanut/ groundnut, sesame, sunflower, pumpkin, melon seeds)
4. Dairy (Fresh whole milk, powdered or evaporated milk, buttermilk, curd, paneer)
5. Meat, poultry and fish (All meats, organ meats, poultry and other birds and fresh and dried fish and seafood/shellfish)
6. Eggs (eggs from any type of bird)
7. Dark green leafy vegetables (all medium-to-dark green leafy vegetables such as spinach, amaranth, fenugreek, mustard leaves, Drumstick leaves)
8. Other vitamin A-rich fruits and vegetables (example ripe mango and ripe papaya; apricot and several types of melon, orange-fleshed sweet potato, carrot, pumpkin, Broccoli,)
9. Other vegetables (example fresh peas, green beans, cauliflower, brinjal, gourds, capsicum, cabbage, okra, radish, cucumber, mushroom, tomato)
10. Other fruits (example amla, apple, berries, coconut, custard apple, grapes, guava, litchi, orange, lemon, pears, plums)

- Women who consume at least 5 of the above 10 food groups are classified as having minimal diet diversity.
- Explain women and family that a well-balanced diet consisting of a variety of food helps in the growth of the baby and prevents anaemia.

3. Lifestyle modification

- All pregnant women should be advised for tobacco cessation to all pregnant women who are either current tobacco users or recent tobacco quitters.
- Counsel them to abstain from liquor.
- Provide pregnant women, their partners and other household members with advice and information about the risks of second-hand smoke (SHS) exposure from all forms of smoked tobacco to promote reduction of exposure and to quit smoking.
- Pregnant women should be informed that a high daily caffeine intake (> 300 mg per day) is probably associated with a higher risk of pregnancy loss and low birth weight. Caffeine is found in tea, coffee, soft-drinks and chocolate. A cup of instant coffee can contain about 60 mg of caffeine, black tea and green tea and soft drinks usually contain up to 50 mg per 250 mL serving.

4. Micronutrient Supplementation and deworming

i.IFA: Iron and Folic acid

- Counsel pregnant women to consume 1 tablet daily with water, before sleeping at night from the 2nd trimester onwards till the birth of the child and then to further continue it for 6 months after the birth of the child.
- If HB is below 11 gram then consume daily two IFA tablets.
- Advice to take IFA after meal to avoid side effects. In case of any complain about the side effects, reassure them that these side effects are usually mild and temporary.
- Advice to avoid consuming IFA with calcium, tea and/or milk, but do have it with lemon/orange as this helps with the absorption of the iron.
- Help pregnant women understand that prioritizing IFA tablets is essential for their health and their baby's well-being.
- Make the benefits of IFA consumption clear. Although the effects may not be immediately visible, consistent intake contributes to better pregnancy outcomes.
- Explain to pregnant women that anemia is a serious condition that affects both the mother and the baby.
- Emphasize that taking IFA tablets can significantly improve their anemia status.
- Take Vitamin C rich diet to improve absorbtion of iron.

ii. Calcium:

- Explain to pregnant women that calcium is essential for bone health, muscle function, and blood clotting.
- Advise her that calcium tablets to be taken twice a day (total 1g calcium/day) starting from 14 weeks of pregnancy up to six months post-partum.
- One calcium tablet should be taken with the morning/afternoon meal and the second tablet with the evening/night meal.
- It is not advisable to take both calcium and iron tablets together as calcium interferes with iron absorption.
- Calcium tablets should not be taken empty stomach since it causes gastritis.
- In addition, all pregnant and lactating women to be counselled about intake of calcium rich foods.

iii. Deworming:

- Advice deworming (Albendazole) tablet to pregnant women during 2nd trimester, It should not be used in the 1st trimester of pregnancy.

5. Safe hygiene practices

- Counsel the pregnant women to use the footwear to prevent hookworm infestations.
- Counsel her to wash her hands with soap after using the toilet, every time before cooking and eating.
- Ensure cleanliness of food items, wash fruits and vegetables before consumption.
- Advice to cover the drinking water properly and boil it before use and/or use purified water.
- Advice not to defecate in open, use the household toilets.

6. Sleep, Rest and Work Pattern

- Maternal sleep, adequate rest, and work pattern play an important role in maternal health and fetal development.
- Counsel them to have 8 hours of sleep at night and at least 2 hours rest during the day. Adequate rest gives physical and mental relaxation which is good both for woman and the baby.
- Advise them to avoid doing heavy physical work like lifting heavy objects and any activity that has a lot of jerky, bouncing movements etc.

7. **Take-Home Ration (THR):**

- Promote the pregnant women to consume the THR from ICDS by themselves, along with home food.

Advice them that THR supplied through AWC is fortified means has more micronutrients and are formulated keeping in mind the additional nutrient requirement during pregnancy.

Section 6 : Perinatal Mental Health

The perinatal period is a period of significant change in both the physical as well as the mental health of mothers. It is a time of great vulnerability where mental health is particularly at risk. Perinatal mental health is a crucial but frequently overlooked and neglected element of maternal and infant care. Mental health of the mother during the perinatal period not only impacts maternal health but also affects child development.

Perinatal Mental Health refers to the emotional wellbeing and mental health of a mother during pregnancy and within a year of childbirth.

Types of Perinatal Mental Health Problems:

Depression
Anxiety, Panic Disorder
Sleep Disorder
Self-Harm
Mother infant bonding disorder
Bipolar Mood Disorder, Psychosis

Perinatal anxiety and depression in the perinatal period are common mental health disorders, affecting an estimated 1 in 10 women in high-income countries and one in five in low- and middle-income countries.

Women with a history of mental health illness are likely to experience worsening of symptoms during the perinatal period, while others may experience poor mental health for the first time in the perinatal period.

Common Concerns faced by the mother:

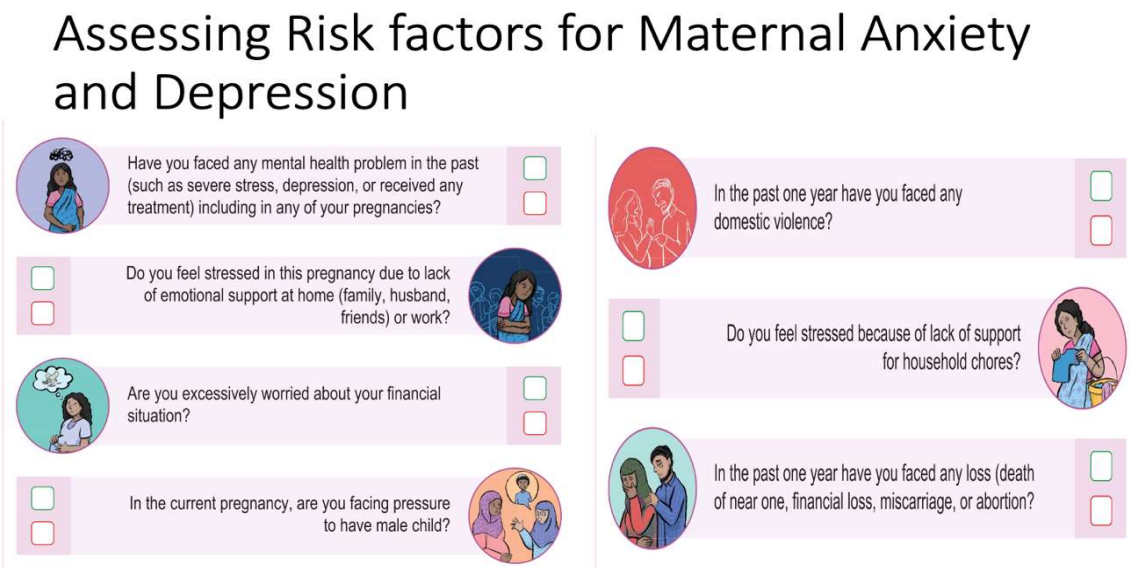
- Well-being about the child,
- Fear of childbirth
- Concerns about breast feeding
- Self-doubt about looking after the baby
- Gender preference

Risk factors:

All women can suffer from mental ailment during the perinatal period however some women with existing risk factors can be at increased risk. History of mental illness, poor outcomes in previous pregnancy, medical illness, high risk pregnancy, social factors like financial stress, poor marital support, family conflicts, gender preference, domestic violence are some common factors that put mothers at risk of perinatal mental illness.

These risk factors can be easily identified during the routine ANC visits.

Addressing these risk factors is crucial to protect perinatal mental health during pregnancy and after childbirth.



Protective factors:

Social support, support from partner and family, maternal resilience, coping skills, optimism, education of mother, planned pregnancy and availability and access to good obstetric care are found to be crucial for protecting protect mental health during pregnancy and after childbirth.

Barriers to accessing mental health care among women:

Social/Family related barriers	Stuctural barriers	Systemic Barriers
• Social stigma and perceiving mental illness as being 'mad' • Lack of awareness and knowledge about mental illness. • Normalising mental stress	• Resource Limitations • Lack of Clear SOPs for screening and management Pathways	• Not covering mental health in routine ANC/PNC check up. • Lack of privacy in ANC/PNC sessions. • Perception about attitide of healthcare providers and fear of being judged. • Fear about medication and its harm of foetus.

Common mental ailments – Signs & Symptoms:

Anxiety and depression are the most common mental illnesses faced during the perinatal period

Anxiety:

- Restlessness
- Excessive sweating
- Dry mouth
- Breathing difficulty
- Constant worry
- Muscle tension/pain
- Nausea/ gastritis
- Disturbed sleep
- Difficulty concentrating
- Not able to relax

Depression:

- Easy fatiguability
- Easy distractibility
- Feeling of hopelessness
- Disturbed sleep
- Disturbed appetite
- Decreased self-care

Post partum Blues:

Feeling low mood and mild depressive symptoms first 2 to 3 days and is extremely common in the perinatal period. Usually this is transient and self-limited and pass off within few days to 2 weeks.

Psychosis and self-harm are rare but possible mental health ailments during the perinatal period and require urgent care and intervention.

Possible consequences of poor perinatal mental health:

Poor mental health can have adverse effects on both maternal health and child development.

- Mothers may find it difficult to look after themselves in terms - nutrition, sleep, self-care, which can adversely impact her physical health.
- Affects mother – infant bonding and attachment and even breastfeeding, in-turn adversely affecting the baby's physical health and development.
- Strained relationship with spouse and family members.
- In extreme cases, suicide ideation and risk of infanticide are also important considerations.

Screening tools:

Brief questionaries can be used to determine the risk of mental illnesses.

Generalized Anxiety Disorder -7 (GAD-7) and Patient Health Questionnaire -9 (PHQ-9) are commonly used tools to screen for anxiety and depression, respectively.

Other tools include - Edinburgh Postnatal Depression Scale (EPDS), Self Report Questionnaire – 20 (SRQ-20), Beck Depression Inventory (BDI), etc.

Promoting positive mental health is important for mothers irrespective of whether they have mental ailments.

- Advised to eat healthy, regular and balanced meals.
- Advised to be active as much as possible.
- Get enough rest and adequate sleep.
- Take help from family, friends or neighbours in daily chores or in taking care of older children.
- Practice self-help techniques such as breathing techniques/Yoga/Pranayam.
- Pursue hobbies/enjoyable activities.
- Encourage mother to communicate feelings with your partner/ friends/family/ healthcare provider.
- Don't be afraid to ask for help when necessary.
- Encourage support from spouse and family members.

Management of Mental Health Disorders:

Most cases can be managed at the PHC level itself by trained Medical Officers and severe cases/ psychiatric emergencies can be referred to District Mental Health Program unit.(DMHPU)

Non-pharmacological interventions: include promoting positive mental health, counselling and cognitive behavior therapies. These can be provided at the PHC level.

Pharmacological interventions: Mothers screened with moderate to severe mental health ailments can be offered pharmacological interventions using the schedule list drugs, prescribed by a trained medical officer. Severe cases can be referred to psychiatrists at District Mental Health Program unit (DMHPU) at DH.

Role of Medical Officers:

- Look out for the risk factors and signs/symptoms of mental distress during routine ANC and PNC visits.
- Providing basic counselling to mothers and positive reinforcement.
- Counselling of spouse and family members.
- Provide basic treatment under Manshakti clinics.
- Refer cases to District Mental Health Programme Unit, as necessary.
- Monitor and follow up of cases.

During pregnancy		
Anxiety Spectrum Disorders and Depression	**Psychosis and Mania**	**Points to remember**
- Among the SSRI-Escitalopram and Sertraline are preferred during the pregnancy. Can avoid Paroxetine to avoid MAO inhibitors - Patient can be started with Escitalopram 5 mg or Sertraline 25mg. - Benzodiazepines-clonazepam-0.25mg can also be used. Consider tapering benzodiazepines before delivery. ESCITALOPRAM T.ESCITALOPRAM 5MG 1---0---0 (can be increased upto 20mg/day) + T.CLONAZEPAM 0.25MG 0---0---1 SERTALINE T.SERTRALINE 25MG 1---0---0 (can be increased upto 100mg/day) + T.CLONAZEPAM 0.25MG 0---0---1 Drug action usually begins by 2-3 weeks and full action by 4-6 weeks. Course of treatment: 6-9 months. If improvement, follow up every month. If no improvement reported-Refer to a psychiatrist. - For somatization disorders - Amitriptyline can be used (started with 12.5mg/day and dose can be increased to 50mg/day) - If no improvement with amitriptyline noted-refer to a psychiatrist.	• Olanzapine and Risperidone are preferred antipsychotics. • Olanzapine is started with 5mg at night and can be increased to 10mg. OLANZAPINE 5MG 0---0---1 (UPTO10MG) • Risperidone is started with 2 mg at night and can be increased to 4mg. • If Risperidone is used anti-cholinergic-Trihexyphenidyl 2mg is used in the morning to prevent Extra Pyramidal Symptoms (EPS) RISPERIDONE 2MG 0---0---1 (UPTO 4MG) + T.TRIHEXYPHENIDYL 2MG 1---0---0	• Valproate is contraindicated in reproductive age group • Lithium avoid in pregnancy since it can cause Ebstein's anomaly (1/1000) • Avoid clozapine • Carbamazepine may lead to neural tube defects– ensure folic acid supplement • Risperidone can cause breast engorgement • First trimester: Avoid Carbamazepine, Valproate and lithium (if possible) • Third trimester and labour: Avoid High doses of benzodiazepines • All trimesters: avoid Monoamine oxidase inhibitors • Antipsychotics during pregnancy can involve risk of weight gain, Gestational DM • Extrapyramidal side effects- transient in infant
Postpartum Period		
• SSRI-considered safe-escitalopram and sertraline are preferred. • Anti-psychotics-safe (except clozapine) • Haloperidol-relatively safe. • Aripiprazole-may reduce lactation. • Risperidone-breast engorgement. • Benzodiazepines-use during breast feed may cause sedation and potential infant dependence. • Valproic acid and carbamazepine-safe in Postpartum period. • Lithium-close monitoring of infant blood levels should be done.		

Section 7 - Preconception Care For Men

7.1 Introduction : Male involvement in pre-conception care is critical for their own as well as the reproductive health promotion of their spouse Male involvement in preconception care is critical to ensure that every pregnancy is wanted and planned.

Although a woman will carry and deliver the child, a man also has a crucial role in successful outcome of pregnancy. A variety of factors, from genetics and lifestyle to environmental exposures and hormones, can affect a man's fertility. Problems in the male partner tend to account for about 40 percent of infertile couples. Improving men's pre-conception health can improve pregnancy outcomes.

7.2 Effects of conditions in men on Pregnancy Outcome

- A man's lifestyle factors can have a direct impact on his partner's pregnancy.
- Tobacco smoking, exposes the expectant mother to second hand smoke and can lead to low birth weight, intra-uterine growth restriction (IUGR), and preterm birth as well as increasing the risk of sudden infant death syndrome(SIDS).
- A man who has HIV or another STI directly puts his pregnant partner and the fetus at risk. Intimate partner violence and coercive relationships have adverse effects on pregnancy outcome.
- Studies have shown a relationship between advanced paternal age and conditions such as autism, and schizophrenia and other mental health disorders.

7.3 Factors affecting Men's Fertility

- Health conditions such as diabetes, erectile dysfunction, and testicular conditions (e.g. varicocoele, history of testicular trauma, un -descended testes, hypogonadism, retrograde ejaculation) may affect fertility.
- Many medicines (e.g. nifedipine, steroids, testosterone, colchicine, selective serotonin reuptake inhibitors [SSRIs], cimetidine, tetracyclines, allopurinol, opiates, ketoconazole) may reduce male libido, contribute to erectile dysfunction, and have toxic effects on sperm. Calcium channel blockers, cimetidine, colchicin, corticosteroids, cyclosporine, erythromycin, gentamicin, methadone, neomycin, nitrofurantoin, phenytoin, spironolactone, sulfasalazine, tetracycline, thioridazine, Beta blockers, serotonin reuptake inhibitors (SSRI) for depression, finasteride (prostate medicine) could have a negative influence on fertility. Supplemental testosterone can also decrease sperm production. Some chemotherapy drugs and radiation treatments for cancer can cause permanent infertility.
- Tobacco, alcohol and certain drugs (e.g. marijuana, cocaine) can affect. spermatogenesis. Smoking is linked with reduced sperm quality, low sperm counts and decreased sperm movement, and higher numbers of abnormally-shaped sperms. Heavy alcohol use may also have a negative effect on sperm health. Alcohol, may also affect the ability to achieve erections. Marijuana and other recreational drug use, including anabolic steroids for bodybuilding, should be avoided because some studies suggest they may negatively impact sperm production.

- Exposure to environmental hazards, radiation, heat, pollutants, lead, mercury and other occupational chemicals have been shown to affect sperm quality.
- Chemicals associated with woodworking, painting, making pottery and stained glass, and gun cleaning may affect sperm production.
- Stress has been shown to negatively impact sperm morphology and concentration.
- According to some studies, every 20 pounds above a man's ideal body weight can lead to a 10% increase in the risk of infertility.
- A number of genetic disorders, (e.g. cystic fibrosis, Klinefelter syndrome, polycystic kidney disease), may impair fertility and affect sperm quality.
- If the sperm's DNA is damaged, it may not be able to fertilize an egg. If a damaged sperm does fertilize an egg, it may result in miscarriage or birth defect in the baby.

7.4 Benefits of Preconception care for Men

Preconception care provides opportunity to men for disease prevention and health promotion and improving childbirth outcome. It helps in preparation for fatherhood. Male preconception care provides an opportunity to improve sperm quality, since damaged sperm can be replaced within 3 months of eliminating the harmful environment.

Goals of preconception care for men

- To create reproductive awareness (Understanding risk factors related to childbearing)
- To encourage to have a reproductive life plan and to see that all pregnancies are intended and are planned.

7.5 Clinical Care for Health Assessment

7.5.1 Risk Assessment

Take a detailed history

- Social history, lifestyle risk factors and behavioral issues (e g smoking, substance abuse, unsafe sex). Risk of STI.
- Man's understanding of reproduction and his reproductive plan.
- Environmental exposures and possibility of occupational hazards.
- Family history of genetic disorders and discuss screening for genetic conditions when indicated.
- Medications, immunization status.

Conduct a physical examination looking for signs or conditions that may affect fertility.

- Note present health conditions,
- When a partner's pregnancy is desired, discuss medications, conditions, and activities that may affect fertility.
- When a partner's pregnancy is not desired, discuss effective contraceptive methods.
- Counseling: On planning the timing of pregnancy; on overcoming fertility issues; modifying health behaviours for improving pregnancy outcome for his partner and their child.
- Consider screening for and counseling to avoid intimate partner violence and coercive relationships and promote respectful and consensual sexual relationships.

- Discuss improving capacity for parenthood, understanding critical role in family, gender issues, emotional health.

7.5.2 Health promotion

Making a reproductive life plan:He with his partner should plan when to have a child.

Stop smoking, stop using "Street" drugs, and drinking excessive alcohol

Planning conception at appropriate Age: As a man gets older, both the volume and quality of his semen tend to diminish. There is a decline in the number of healthy sperms and their movement, and they can also have more DNA damage in their sperm. The rate of genetic mutations transmitted via sperm cells increases significantly with age; risk for psychiatric disorders in offspring, especially autism spectrum disorders (ASD) and schizophrenia is also increased.

*Improving Nutrition***:**Diet high in sugar, fat, processed foods are associated with reduced sperm motility. Energy dense diet is associated with reduced motility, abnormal shapes of sperms and damage to DNA integrity. Eating healthy foods with plenty of fruits and vegetables, which are rich sources of antioxidants may help to produce healthy sperms. Men should also consume fiber-rich foods, healthy monounsaturated fats, and moderate amounts of lean protein to protect against free radicals, which can cause damage to DNA within sperm cells.

Engaging in Regular physical activity: Men should get regular exercise to reduce stress, to feel better and have a long-term health.

*Optimization of BMI:*Male obesity negatively impacts fertility through changes in hormone levels, as well as direct changes to sperm function and sperm molecular composition reducing fertility and embryo health. Obesity affects a man's sperm quality, reducing sperm counts and decreasing their motility, as well as increasing damage to genetic material (DNA) in sperm. Recent data has shown that male obesity also impairs offspring metabolic and reproductive health suggesting that paternal health cues are transmitted to the next generation with the mediator mostly likely occurring via the sperm. Excessive body fat is associated with reduced serum testosterone and increased estradiol levels in men. In men having IVF treatment obesity is associated with reduced development of embryo and decreased live birth rates.

Protection from heat: There's a link between increased temperature of the scrotum and reduced semen quality. Engaging in welding jobs, frequent visits to and long stays in hot tubs, saunas and steam rooms could increase scrotal temperatures, which may decrease sperm counts and sperm quality. Reduced sperm counts may be temporary and could return to normal in a few months once a man controls the exposure to heat.

7.5.3 Clinical Interventions

Getting health conditions under control: Screening for hypertension, obesity, diabetes mellitus, mental health disorders should be carried out. Controlling high blood pressure and diabetes, may improve a man's chances of getting his partner pregnant.

Preventing and treating Sexually Transmitted Diseases (STDs):Men should get screened and treated for any STDs. They should continue to protect them and their partner from STDs.

*Managing Medications that may affect sperm count and quality:*A thorough medication history, including past and current medication use should be reviewed.

Controlling Exposure-Related Damage to Sperm Quality*:* Exposure to lead in men has shown to be associated with reduced sperm counts, abnormal sperms, reduced motility and altered sexual performance. Exposure to mercury in men is associated with altered hormones levels affecting sexual performance. Kepone, an insecticide is known to produce male infertility. Dibromo chloropropane (DBCP), a pesticide interferes with action or production of androgens by testes. Ethylene glycol ethers used in electronic manufacturing, fuel dicers, ink photo, lead smelting, battery manufacturing, lead paint, carbon disulfide, ethylene dibromide (chemical industry fumigant), Vinyl chloride – polymerization industry are other suspected spermatotoxins. Radiation or chemicals may cause changes or breaks in the sperm DNA.

Harmful substances can enter the body of workers by breathing them in, by contact with skin and by swallowing them (if workers do not properly wash their hands before eating, drinking, or smoking).

Precautions:

- Consult the Material Safety Data Sheet (MSDS) provided by the employer for information about the hazards and necessary precautions for the material being used at the workplace. Follow the safety work practices and procedures implemented to prevent exposures. Participate in all safety and health education, training.
- Wear the appropriate personal protective equipment specified for the job.
- Store chemicals in sealed containers when they are not in use. Use the smallest quantity possible. Practice emergency procedures in case of a spill or other emergency. Avoid skin contact with chemicals. If chemicals contact the skin, follow directions for washing
- Wash hands before eating, drinking, or smoking.
- Change the contaminated clothing and wash with soap and water before going home. Wash work clothing separately from other laundry and avoid bringing contaminated clothing or other objects home.

8. Early Childhood Development

1. Nurturing care framework and its importance

The child's brain grows rapidly from conception to the first two years. Proper childcare during this period has many short-term and long-lasting benefits, such as making the child smarter, reducing behavior violence, reducing anxiety and depression as the child grows older and has greater chance of earing higher incomes as adults. Five components are very important for proper child care and development of a child. All these factors help in the overall development of the child. Presently, in the Low and Middle Income Countries (LMIC) of the world, an estimated 250 million (43%) children under the age of 5 years are not able to reach their full development potential. (Source: 2017 Lancet ECD Series)

1.1 Good health : Child's health is an important component in early childhood development. Mental health is also important along with the child's good physical health. It is important to protect the child from various diseases, timely vaccination, provide treatment as soon as possible in case of illness, and provide an opportunity to adopt good habits to stay healthy.

1.2 Adequate Nutrition: Child's nutrition is important for growth and development right from the uterus. Exclusive breastfeeding for initial six months after and after the completion of six months, along with the mother's milk, the complementary feeding, its quantity, density, frequency and variety of food are important. Similarly, responsive feeding includes identification of the huger and satiety cues in the child.

1.3 Responsive caregiving:

Along with proper nutrition and good health, love and affection are also important. Responsive caregiving means caregivers are sensitive towards the child and they recognize the child's needs through the child's movements, gestures, eyes and voice, understand what the child is trying to say, acknowledge those cues and respond accordingly. This enables the child to learn and absorb new things and helps in strengthening the bonds between the child and caregivers.

1.4 Early Learning Opportunities:

Science has proved that a child's learning begins at conception. In the early years, the child learns through touch, talk and play. The child needs the warmth of love. The child feels safe when the caregiver holds the child, smiles, kisses or hugs the child. The child needs praise and encouragement. The child becomes smarter by mimicking voices and gestures. By playing different games, the child learns many new skills.

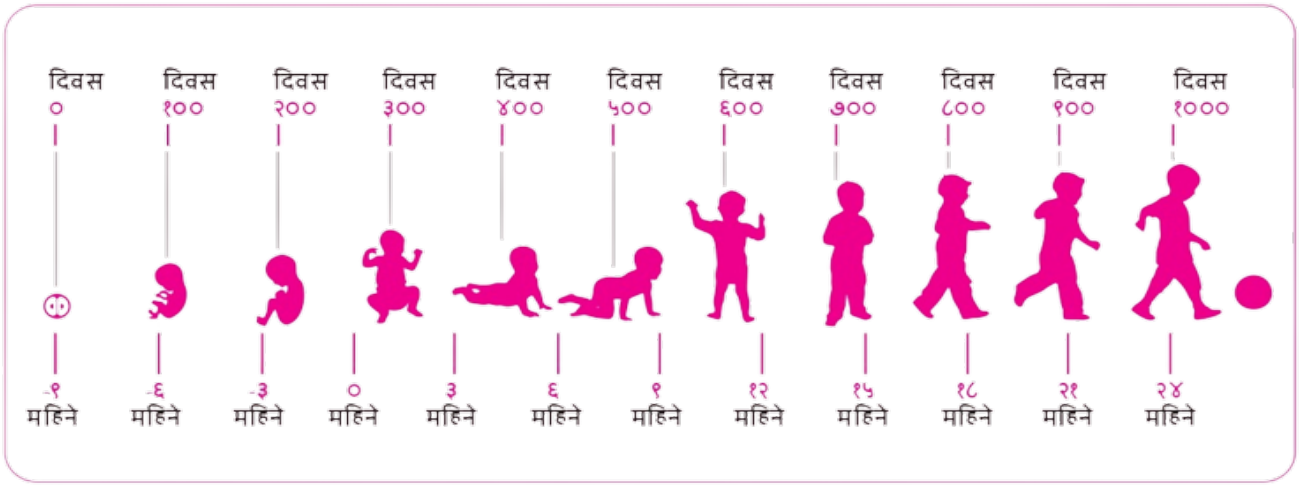
1.5 Safe environment:

Keeping the child safe from physical and emotional trauma is essential for the child's proper development. Adverse childhood events such as physical, emotional abuse in childhood has long lasting effects for the rest of the life. It is necessary to create a safe and happy environment around the child.

All the above five elements of child care are necessary for the child to reach their full potential and overall development. If the child gets all these five elements in the initial 1000 days (two years) then ensures the overall development.

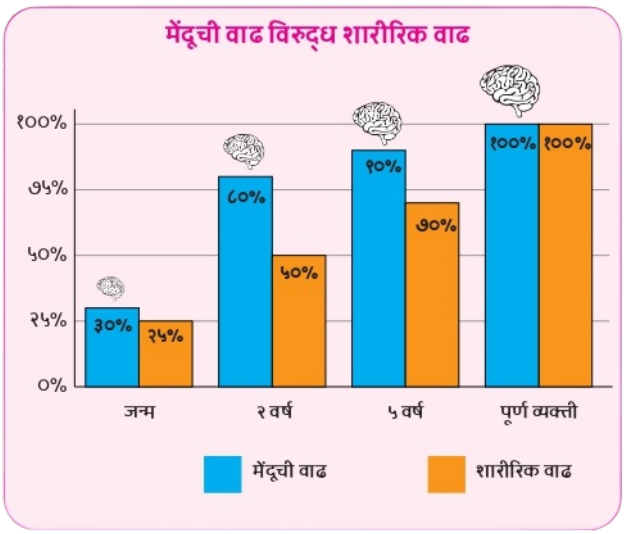
1.6 Significance of the first 1000 days (conception to two years of age):

The development of the baby's brain begins at conception. In the first 1000 days, the child's brain grows rapidly. By the second year of the child's life, about 80 percent of the brain growth is completed, during which more than 1 million new brain cells are added (neural connections) every second. During this period, the development of a child's physical, emotional, social and intellectual abilities accelerates, which becomes the foundation for the child's success in school, then in the workplace and in society. Science tells us that during this period, a child needs touch, talk, play, encouragement and love. This helps to make the neural connection dense. The interactions between genetics and the child's early childhood experiences shape brain growth. Child care starts at home, but we can support their whole brain development through various means, services and contribute towards building a strong society.



The graph below shows how the rate of brain growth differs from physical growth.

- Brain growth at birth is 30% of adult brain growth, while physical growth is only 25% of adult growth.
- By the age of two, brain growth is 80%. In comparison, physical growth increases by 50% of adult growth by the age of two.
- Stimulation helps in thickening of brain connections/neural network in the brain. For this reason, it is important to stimulate the child's brain at this age.
- This shows us that in the first five years, the brain growth is very fast. During this period we need to give the children the right boost or encouragement.



However, in the early years, if the child is neglected for any reason, such as poverty, frequent physical/emotional abuse, the environment of depression in the house, etc., it can have an adverse effect on the growth of the child's brain.

The next 1000 days (2-5 years of age): Following the first 1000 days of life that span from conception to two years of age, the next 1000 days of a child's life from 2–5 years of age offer a window of opportunity to promote nurturing and caring environments, establish healthy behaviours, and build on early gains to sustain or improve trajectories of healthy development[1].

1.6.1 Concept of early childhood development through rope game

The coach should give the instructions of the following game and ask the trainees to play this game

1.6.1 Concept of early childhood development through rope game

The facilitator should give the instructions to the trainees about the game

Method 1

Setup: Ask the trainees to stand in a circle and provide a rope bundle to one of them.

Playing **the Game**:

- Hold one end of the rope and throw the bundle to another trainee.
- Encourage each trainee to participate in the game without giving specific instructions.
- If the bundle falls down, encourage and motivate the participants to start again.

Conclusion: After the game, ask everyone to keep the rope down.

Method 2

1. **Setup**: Ask the trainees to stand in a circle again and provide them with the second bundle of rope.
2. **Explain the Rules**:
    - If the bundle falls down, the trainee will be out of the game.
    - The bundle should not be thrown.
    - Trainees will be scolded, shouted at, and punished if they break the rules.
    - There will be a time restriction.

[1] Draper, C. E., Yousafzai, A. K., McCoy, D. C., Cuartas, J., Obradović, J., Bhopal, S., Fisher, J., Jeong, J., Klingberg, S., Milner, K., Pisani, L., Roy, A., Seiden, J., Sudfeld, C. R., Wrottesley, S. v., Fink, G., Nores, M., Tremblay, M. S., & Okely, A. D. (2024). The next 1000 days: building on early investments for the health and development of young children. In *The Lancet* (Vol. 404, Issue 10467, pp. 2094–2116). Elsevier B.V. https://doi.org/10.1016/S0140-6736(24)01389-8

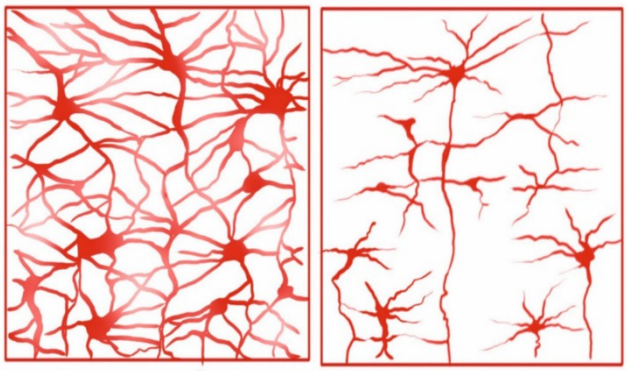
- No one is allowed to clap or encourage while playing.

3. **Play the Game**: Allow the trainees to play the rope game following the stated rules.
4. **Observe the Patterns**: After the game, ask the trainees to put down the pattern created by the game. Have all trainees observe and compare both patterns.

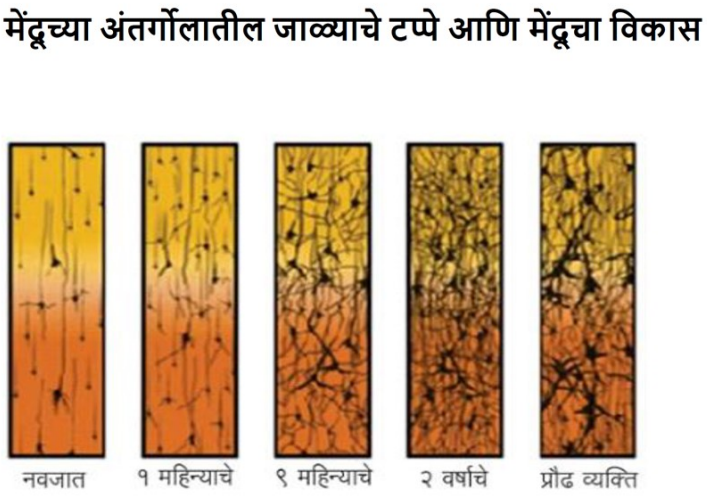
- Engaging in brain-boosting games, interactive activities, and positive actions such as proper touch, love, pampering, encouragement, laughing, and singing helps the brain's neural network to become dense.
- To make a better person of the future, to make your child smart, it is very important to play with children, communicate with them.
- A child's physical, emotional, intellectual and social skills develop rapidly in the first 1000 days of life and this development lays the foundation for future all-round development.

This picture is a neural network in the brain.

- In given picture, the network appears dense in one picture and sparce in the other.
- By conducting stimulating activities it boosts the child's brain, communicating and playing activities, encouraging, and providing opportunities, the child's brain network becomes much dense.
- In contrast, brain networks are weakened by behaviors such as lack of play and communication, .



- **1.6.2 Stages of the neural network in the brain and brain development**
- The rate of brain network getting dense is highest by the age of two. In this picture, we see very little difference between the brain network of a two-year-old child and the brain network of an older person. Thus, the initial two years are very important.
- Conducting brain-stimulating activities with children playing, communication activities, touch, love, response can help brain network to get dense.
- Lack of play and communication can make the brain network sparse.
- To make a better person of the future, to make your child smarter, it is very important to play with children, communicate with them, touch them properly.



2. Good Health

The implementation of the National Health Mission has helped in reducing the child mortality rate in Maharashtra also been an improvement in the health care services for children. However, in many cases the challenges in health care persist and need to be addressed.

No.	Index	Percentage
1	Children under the age of three who have been breastfed within 1 hour of birth	53.2%
2	Exclusively breastfed babies under six months of age	71%
3	Infants who received adequate nutrients (adequate nutrients and frequency) with breastfeeding at 6-23 months	8.4%
4	Proportion of stunting in children under 5 years of age	35.2%
5	Proportion of severely malnourished children under 5 years of age	10.9 %
6	Proportion of underweight children under 5 years of age	36.1%
7	Proportion of overweight/obese children under 5 years of age	4.1%
8	Proportion of anaemia in children aged 6–59 months (HB < 11 g)	68.9%
9	Fully vaccinated children between the ages of 12 and 23 months	73.5%
10	Children between the ages of 9 and 35 months who have received a dose of vitamin A in the last 6 months	72.2%

Source: National Family Health Survey 5 (NFHS)

2.1 Home Based Newborn Care (HBNC)

Effective care for both the mother and newborn immediately after delivery is crucial. Neglecting this critical period can significantly increase the mortality rate for the newborn. By ensuring attentive care during this time, both the mother and baby have a better chance of thriving. Under the HBNC program, postpartum care and essential newborn care are provided by ASHAs includes home visits on the 3rd, 7th, 14th, 21st, 28th, and 42nd days after delivery.

With the help of page no. 7 and 8 of the Mother and Child Protection Card, the following issues are examined and counselled.

- For the mother - bleeding, temperature, is the mother conscious?
- Breastfeeding
- Weighing the baby
- Taking the baby's temperature
- Care of umbilical cord, condition of eyes, body movements and crying
- Keeping baby warm (KMC)
- Congenital defects
- Cracks and redness on the skin as well as blisters with puss
- Discharge from the cord, discharge from the eye
- Yellowing of eyes and skin

- Signs of infection
- Danger signs
  - If the baby cannot breastfeed
  - Weak crying /overall weakness
  - Difficulty in breathing/shortness of breath
  - Body feeling cold/hot after touch
  - Yellowing of palms of the hands and feet

  If such serious symptoms are detected, inform parents/caregivers about the availability of free treatment and referral services (102-vehicle/ ambulance system) under the Janani Shishu Suraksha Karyakram (JSSK).

2.2 Kangaroo Mother Care

KMC is a simple method of care for low-birth-weight infants that initiates early and prolonged skin-to-skin contact with the mother (or a substitute caregiver) and exclusive breastfeeding.

The three components are as follows:

1.Skin -to-skin contact of mother and baby:
In this, the baby is placed on the chest between both the breasts of the mother,make sure baby is covered . The mother should also wear the right clothes to give skin -to -skin to the baby.
Try to keep the baby in this position as soon as possible immediately after birth.
KMC can be given to baby as much as possible , Minimum at least 2 hours daily should be given to baby

बाळाचे वजन २ किलोग्रॅमपेक्षा कमी असल्यास एएनएमशी संपर्क साधून
सतत स्तनपान देणे आणि कांगारू मदर केअरसाठी आरोग्य सेविकेशी संपर्क साधून मदत घ्या

नवजात बालकाची काळजी

	१ला दिवस	३रा दिवस	७वा दिवस	६वा आठवडा
वजन				
लघवी झाली				
शौचास झाली				
अतिसार				
उलटी				
आकडी येणे				
हालचाल (चांगली/सुस्त)				
दूध ओढणे (समाधानकारक/असमाधानकारक)				
श्वासोच्छ्वास (वेगाने/ त्रासाने)				
छाती आत ओढलेली (होय/नाही)				
शरीराचे तापमान				
कावीळ				
नाळेची स्थिती				

2) **Exclusive breastfeeding :**After birth , the baby can be breastfeed as when needed,If necessary, the mother can take express breast milk and feed it with a spoon or cup.

3) **Cooperation and support:** Necessary medical, emotional, psychological or any other type of support should be provided to mother to give KMC to baby

Kangaroo mother care can also be given to the child by the father or other healthy family members .

The family should also support the mother to give kangaroo mother care to her baby

Use of this method: Kangaroo mother care can be given at home, in the hospital, in SNCU for babies with weight less than 2.5 kg.

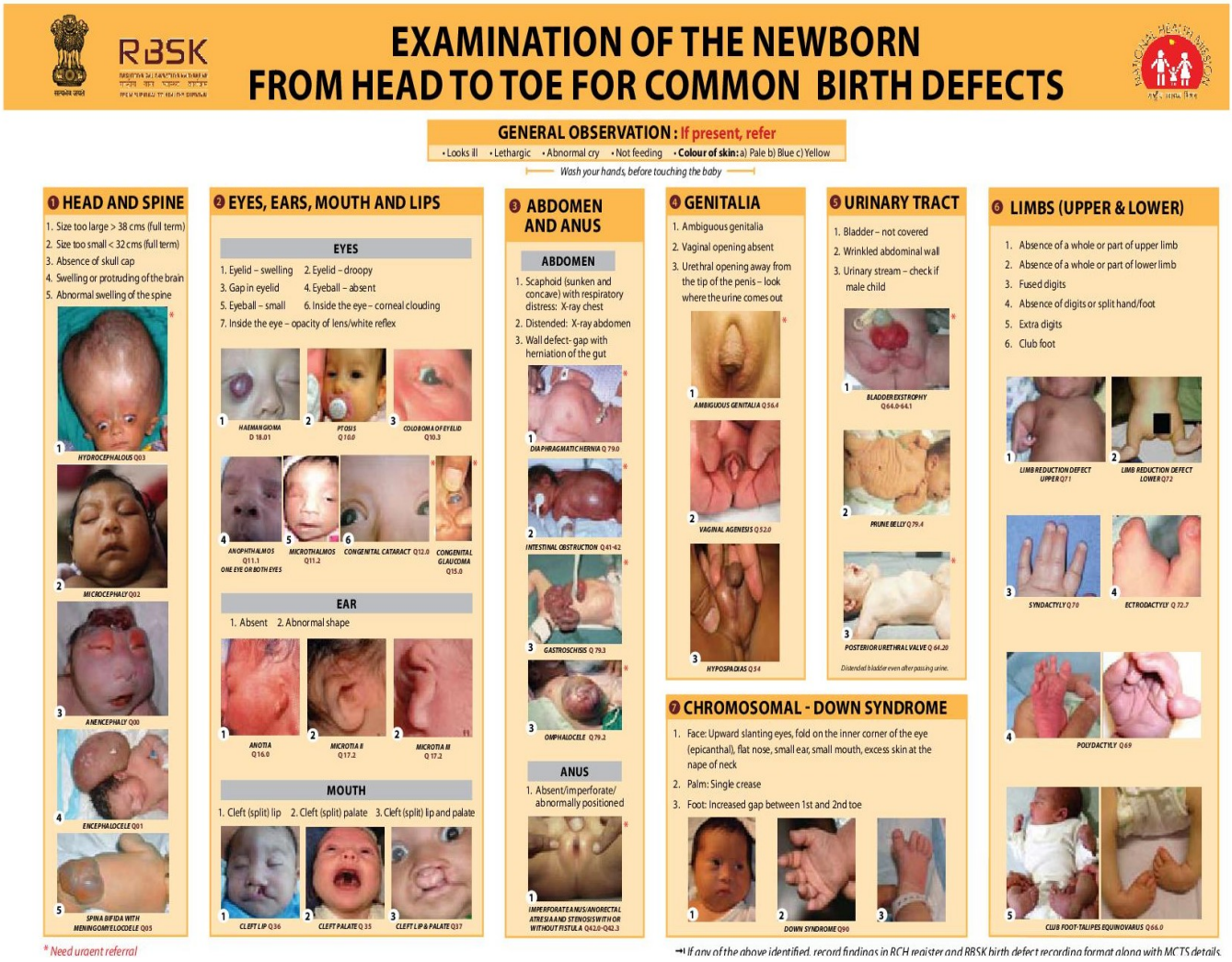
Advantages of KMC:

- Initiates breast feeding
- The temperature of a very LBW baby remains warm as if baby is kept in warmer
- Adequate and peaceful sleep
- Helps for Better weight gain
- Bonding between mother and baby becomes strong.
- Help in reducing mother's mental stress and boosting her confidence
- Reduces the chances of infection
- Early discharge from hospital despite being low birth weight.
- Cost savings

To protect your baby from serious and disabling diseases, the right vaccines should be given at the right age of the baby.

2.3 Visible birth defects

Some birth defects are easily visible to the eye, while other birth defects require medical devices and other test for diagnosis. Apart from this, some blood tests can diagnose congenital diseases, inborn errors of metabolism, haemoglobinopathies, etc.Visible birth defects are disorders that do not require special examination or specialists to identify. They are easily visible to the eye and such children can be cured with early diagnosis and treatment. These include neural tube defects, Down's syndrome, cleft lip/palate, clubfoot and developmental dysplasia of hip. It is important to diagnose visible birth defects at the earliest at all delivery points and by ASHAs during every home visit and refer such babies during there HBNC visit.



2.4 Home-based care for young child (H.B.Y.C.)

During the first 1,000 days of a child's life, they undergo rapid growth and development. Remarkably, 80% of brain development occurs in the first two years. This period is critical, as the foundation for a child's future cognitive, emotional, and physical health is established. Paying close attention to a child's needs during this crucial time ensures they have the best possible start in life.

Under HBYC programmes, ASHA provides home visit i.e. 3 months, 6 months, 9 months, 12 months and 15 months, during these home visits ASHA is expected to measure weight, Screening and examination of children, counselling of parents and follow-up on the following issues with the help of page 8 of the mother and Child Protection Card.

Examination and counseling are expected on the following topics:

- Exclusive breastfeeding
- Complementary feeding – Responsive Diet
- Assessment of sick children
- Checking vaccination status
- Childcare tips: Providing information about play and communication with children.
- Developmental delays
- Records on growth chart as per weight and height
- Responsive care
- Safe environment
- ORS and zinc for diarrhea
- IFA Syrup
- Vitamin A
- Deworming Tablets
- Family planning
- Providing referral services as needed if danger signs are identified
- Assessment of maternal health status
- Nutrition of mother - IFA and calcium tablets
- Hand washing methods / Information about hygiene

आशाकरीता एचबीवायसी पाठपुरावा कार्ड (√ ची खुण करणे)

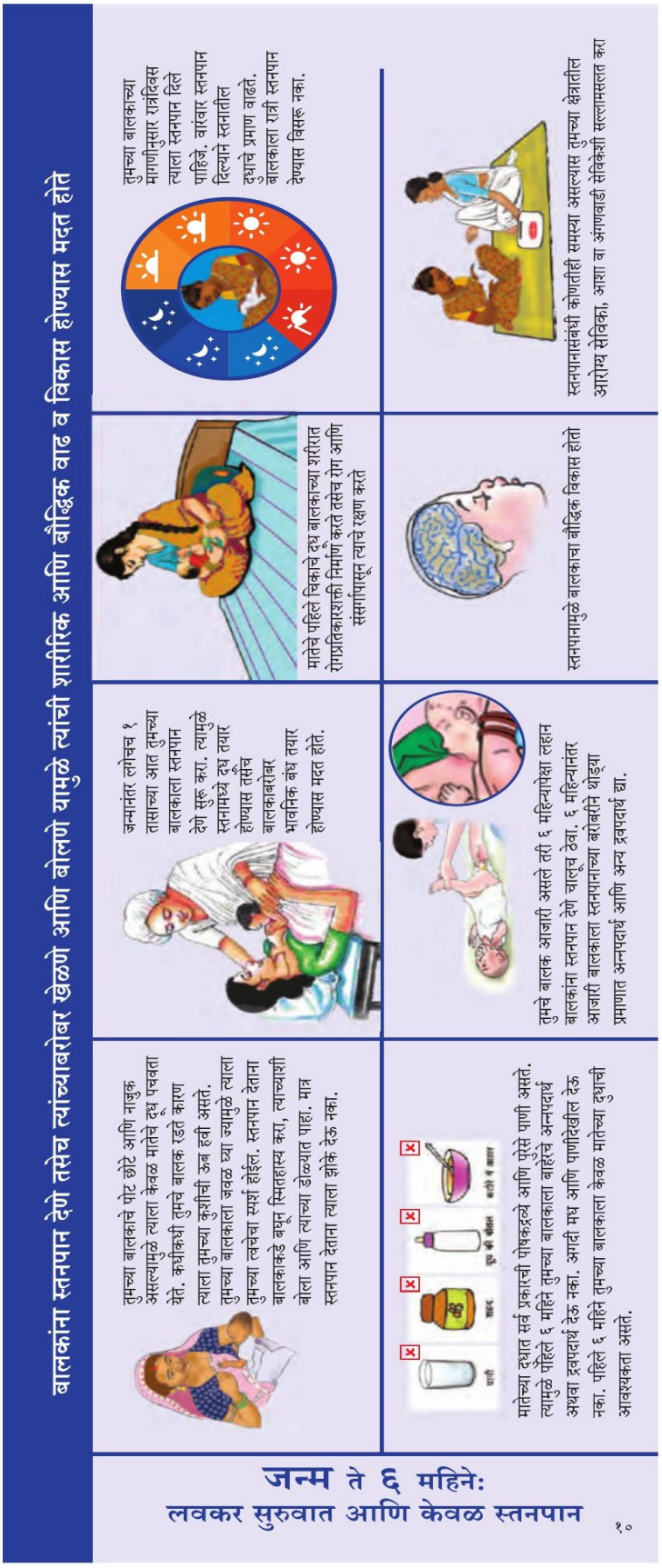
			३ महिने	६ महिने	९ महिने	१२ महिने	१५ महिने
१.	बाळ आजारी आहे का? (होय/नाही)--						
	आजारी असल्यास जवळच्या आरोग्य केंद्रात संदर्भित केले काय?						
	स्तनपान चालू आहे का?(होय/नाही)--						
२.	पूरक आहार दिला जात आहे का	- एका वेळी २/३ चमचे आहार (दररोज २-३ वेळा)	x		x	x	x
		- एका वेळी १/२ कप आहार (दररोज २-३ वेळा) जेवणा व्यतिरिक्त १-२ वेळा न्याहारी	x			x	x
		- एका वेळी १/२ कप आहार (दररोज ३-४ वेळा) जेवणा व्यतिरिक्त १-२ वेळा न्याहारी	x	x			x
		- एका वेळी ३/४ कप आहार (दररोज ३-४ वेळा) जेवणा व्यतिरिक्त १-२ वेळा न्याहारी	x	x	x		
३.	अंगणवाडी सेविकेने वयानुसार वजनाची नोंद केली काय?						
४.	नोंद केली असल्यास एमसीपी कार्ड मधील वजन लिहा (किलोग्राम मध्ये लिहा)						
५.	अंगणवाडी सेविकेने वयानुसार उंचीची नोंद केली काय?						
६.	नोंद केली असल्यास एमसीपी कार्ड मधील लांबी/ऊंची लिहा (सेमी मध्ये लिहा)						
७.	बाळ वयानुसार कमी वजनाचं (एमसीपी कार्ड मध्ये पिवळा पट्ट्यात) आहे काय?						
८.	बाळ वयानुसार तीव्र कमी वजनाचे (एमसीपी कार्डमध्ये लाल पट्टयात) आहे काय?						
९.	तीव्र कमी वजनाचे असल्यास एनआरसी ला संदर्भित केले काय?						
१०.	बाळामध्ये काही विकासात्मक विलंब आढळला आहे काय?						x
११.	विकासात्मक विलंब आढळला असल्यास आरोग्य केंद्रात संदर्भित केले आहे काय?						x
१२.	वयानुसार लसीकरण केले आहे काय? (एमसीपी कार्ड बघा)						
१३.	गोवर-रुबेलाची लस टोचली आहे काय? (एमसीपी कार्ड बघा)		x	x			
१४.	'अ'जीवनसत्व दिले आहे काय?		x	x		x	
१५.	घरी ओ.आर.एस (**ORS**) आहे काय?		x				
१६.	घरी आयएफए (**IFA**) सिरप आहे काय?		x				
			३ महिने	६ महिने	९ महिने	१२ महिने	१५ महिने
१६.	निव्वळ स्तनपान देण्याचा सल्ला (होय/नाही)			x	x	x	x
१८.	पूरक आहार देण्याचा सल्ला (होय/नाही)		x				
१९.	हात स्वच्छ धुण्याचा सल्ला (होय/नाही)						
२०.	बालसंगोपनाचा सल्ला (होय/नाही)						
२१.	कुटुंब नियोजनाचा सल्ला (होय/नाही)						
२२.	ओ.आर.एस (**ORS**) दिले आहे काय?(होय/नाही)		x				
२३.	आयएफए (**IFA**) सिरप दिले आहे काय? (होय/नाही)		x				

८

3. Adequate Nutrition

3.1 Exclusive breastfeeding

Exclusive breastfeeding means providing only breast milk to the baby for the first six months (180 days) after birth. Till the age of 6 months, the baby gets all the nutrients and enough water from the mother's milk. The babies who are exclusively breastfed need not be given anything else. During the home visit, ASHA is expected to provide counselling with the help of page 10 of the Mother and Child Protection Card.



Important messages for breastfeeding:

Focus on the following important messages for breastfeeding counseling to mothers and caregivers

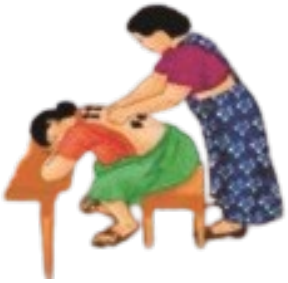
- You may refer to page No. 10 of the Mother and Child Protection card.
- If breastfed within an hour after birth, the baby gets colostrum, which boosts his immune system.
- Colostrum is the first yellow thick sticky milk that is needed to nourish the baby and protect it against germs.
- Breastfeeding promotes the growth of the baby's brain, physical and intellectual development and protects the baby from obesity, hypertension, diabetes in adulthood.
- The mother should give milk to the baby whenever he/she wants it, day or night. Even if the baby has diarrhea or other diseases, the mother should continue breastfeeding to ensure that he gets proper nutrition and feels better quickly.

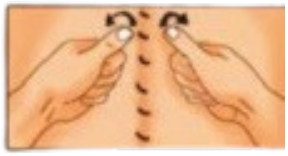
3.1.1 Techniques for expression of breast milk:

Enough amount of milk is produced by mother in the early days after delivery. Also, the low birth weight baby may have less and less ability to suck milk. As a result, milk accumulates in the breasts and there may be milk lumps in the breast. In such a situation, it is important for the newly delivered mother to know the technique of expressing milk from the breasts.

The skills to express milk from the breasts are as follows:

- **To be calm and stimulate mothers milk by giving back massage.**
- Massage the back. Do a hand workout, give hot fermentation or take bath with hot water if possible (if the breasts have become stiff). Hold the baby close to yourself. If the baby is away, think of the baby or put a photo of the baby in front of you.





- **Releasing milk from the breast**

Support the breast from below with one hand and massage the breast from all sides outside the nipple between the fingers of the other hand. Massage in parallel motion (To do this, you have to put more pressure on the finger near the areola region) Do not forget to massage the breast area also in the armpit area.

- **Bringing milk forward**

Pressing back and forth on each breast helps the milk reach the areola area, or if the elbows of both hands press the breasts together, the milk will reach the black area.

(a) Bending in front will also help in the process of bringing milk forward due to gravity.

b) Special care should be taken to avoid hurting the mother and also to avoid injury to the skin/nipples in the entire process of expression of milk (Massage gently.)

- **Expressing Breast Milk**

Hold the breast one inch behind the nipple in a small ' C ' shape and give it a push with fingers and thumb.

3.1.2 Methods of feeding low birth weight babies

- **Feeding with a bowl / wati**

A baby which is stable and is able to coordinate suck - swallow and breath, it is advisable to feed such baby with a bowl / wati.

Feeding by Paladai/*Bondle*

Paladai is a steel utensil with a narrow tip. In some places, it is used to feed a low-weight baby. A baby which is stable and is able to coordinate suck - swallow and breath, it is advisable to feed such baby with a paladai. Milk can be fed faster with paladai than with a cup or spoon and the chances of spilling the milk is less.

- **Feeding milk with a spoon**

Breastfeeding with a spoon may be easier for mothers who can't start breastfeeding right away. However, if the mother learns the skill of feeding milk in a bowl, the child can drink milk as much as he wants and without any interruption.

3.1.3 Method of waking up a baby

1. Slowly remove the blankets from the baby's body.
2. Take off the clothes of baby (E.g., removing the buttons of the shirt and making baby free)
3. Replace the baby's nappy if wet.
4. Touch the baby's body/skin.
5. Massage the baby's back, legs, buttocks and neck lightly.

3.1.4 Symptoms of infant hunger

0 to 6 months

child sucks his fist and fingers

I. Extensive movement of the hands and feet.
II. Saliva dripping from the mouth.
III. Turning eyes around and trying to find her mother.
IV. Showing interest in breastfeeding by turning her head toward the breast or making movement.
V. Crying

6 to 12 months

I. Following the mother.
II. Pulling mother's leg
III. Pointing to kitchen on his /her snack box.
IV. Crying at the end.

3.2 Complementary Feeding

Breast milk alone is not enough to meet the growing needs of the baby.

From 6 months to 24 months, the child's growth and development is rapid and his nutritional needs increase further.

Therefore, according to the age group, the parents/caregivers are expected to be counselled with the help of page 11 of the Mother and Child Protection Card regarding nutrition.

Requirements of complementary feeding

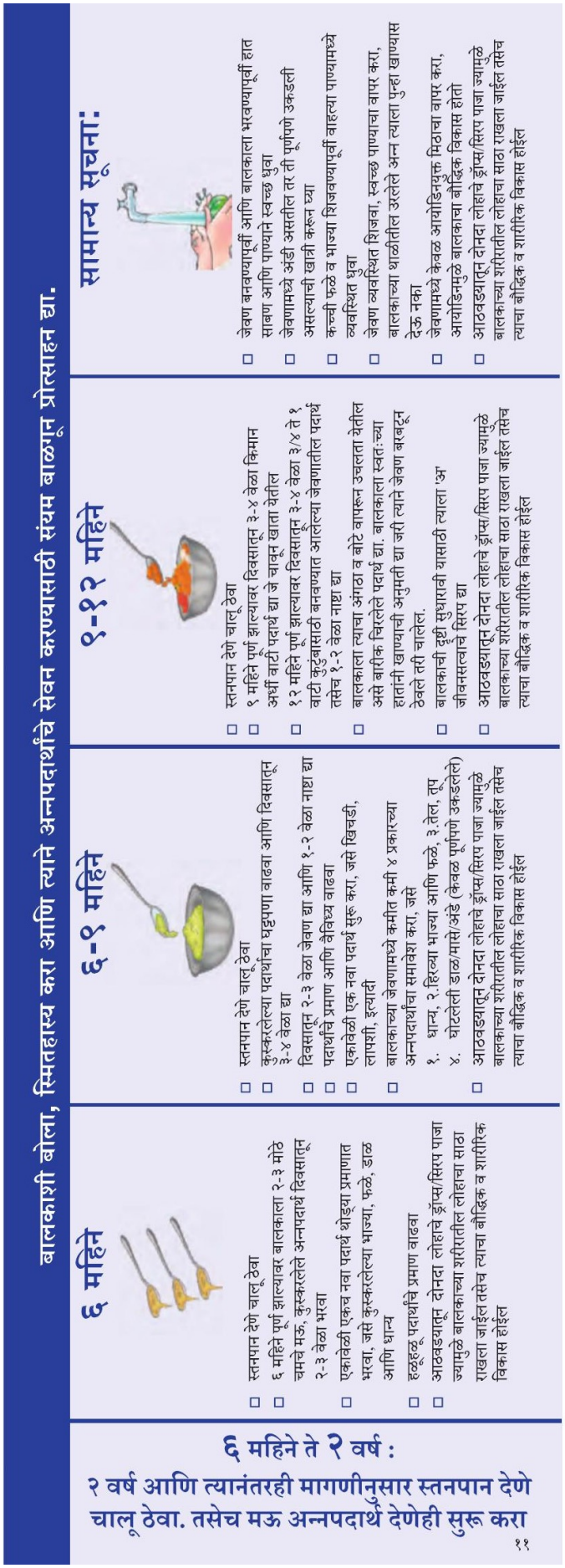
1. **Timely** – at completion of 6 months when there is growing need
2. **Adequate** – Should provide sufficient nutrients to meet growing needs of child – energy, protein, vitamins, and minerals from different foods
3. **Avoid forceful feeding**– Active feeding to encourage the child more without forced feeding.
4. Children have small stomach so they should be fed more frequently.
5. **Safe** – Food should be hygienically prepared and stored.

Five Important things to remember about Complementary Feeding

1. **Consistency** – Initially include soft and mashed food, gradually increase to appropriate thickness
2. **Quantity** – Increase with age,
3. **Frequency** – Number of feeds to increase with age
4. **Density** – Add some oil/ghee/fats/sugar to make the feed rich in energy
5. **Variety** – Add vegetables / fruits / meat / eggs / poultry / fish/cereals/millets/pulses/dairy products

Exclusive breastfeeding:

- Breastfeeding is an important source of nutrition and provides energy and protection from infections, so breastfeeding should be continued for at least two years or more.
- Continue breastfeeding for at least two years or more with complementary feeding



3.3 Responsive Feeding

- Responsive feeding is the ability of the caregiver to identify the signs of a child's hunger and responsive towards child.
- It is essential to counsel both the mother during delivery and the caregiver on breastfeeding and responsive supplement feeding during home visits. E
- Ensuring they understand the significance and methods of proper breastfeeding and responsible for Complementary feeds.

- **Responsive feeding method**

- Encouraging the child to eat on their own by playing and interacting with the child while eating.

Giving a responsive feeding is a process that takes place in two ways:

- The child shows signs of hunger, which is recognized by the caregiver and feed the child as soon as possible.
- The child shows signs of being full, which is also recognized by the caregiver and stops feeding the child to avoid forceful feeding.
- When the child is learning to eat with his own hands, the caregiver should be keep patience and encourage the child to eat.
- Breastfeeding and supplements should be properly given
- Make sure the child's attention is not distracted elsewhere.
- To introduce the child to the food and create a taste for the food, with the child the food he is eating.
- The child should be served with separate plate, not forced feeding the child.

Example : No. 1

The child is sitting on the lap of the caregiver and his hands are held in such a way that the child cannot touch the bowl or food. The caregiver is hastily feeding the child with a spoon. If the child struggles to touch the bowl as well as to get food from the bowl, or turns its back because it does not want food, the child is brought back to the food position. If the child does not eat, it is forced to eat it. When the caregiver feels that the child has had enough food, the bowl of food is taken away from the child. The decision of how much a child should eat is always made by the caregiver.

Example : No. 2

The child is seated on the mat. The caretaker tells the elder sibling to place the bowl of food with spoon near the child and the two older siblings and the caregiver turn around and continue their work. The caregiver or the elder siblings do not communicate with the child while the child is eating and play among themselves and do not help feed the child. The child spills food around the bowl and looks at everyone for help but no one helps the child. The child eats a little bit but the food spills down because it cannot manage the spoon properly, so the child tries to eat with his hands but cannot eat alone, the child stops eating and pushes the bowl away. "Oh, you're not hungry," the caregiver says, taking the bowl away from the baby.

Example : No. 3

Caregivers wash their hands and the child's hands and explain to the child why it is important to wash their hands. The caregiver then sits in front of the baby so that both feel comfortable and convenient.

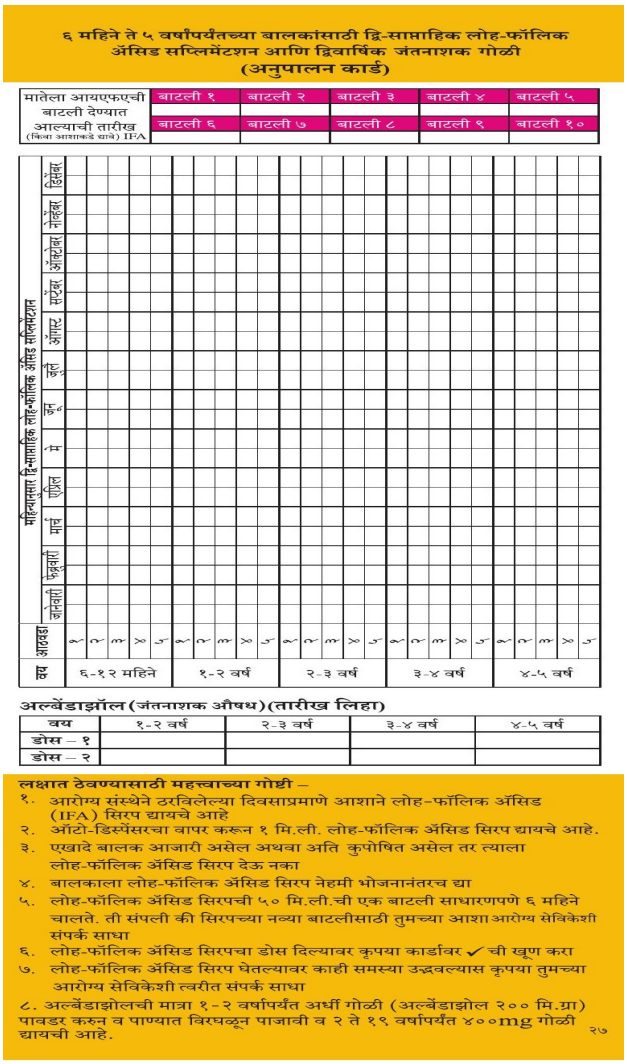
A separate bowl is used to feed the child. The caregiver places little food on the child's lips with the help of a small spoon and communicates with the child's eyes and smiles at the child while feeding. Sometimes the child opens his mo uth and takes food. To help the child's language development and general intellectual development and to make the child interested in food, the caregiver talks about the food that the child is eating, such as rice and dal in the spoon. The color of the dal is yellow, the color of rice is white, etc. When the child refuses to eat by closing the mouth or turning its head, the caregiver tries to feed once again and stops feeding when the child refuses.

Sometimes the child opens his mouth and takes food. To help the child's language development and general intellectual development and to make the child interested in food, the caregiver talks about the food that the child is eating, such as rice and dal in the spoon. The color of the dal is yellow, the color of rice is white, etc. When the child refuses to eat by closing the mouth or turning its head, the caregiver tries to feed once again and stops feeding when the child refuses.

Sometimes the caregiver will give the child a piece of food that they can hold in their hand, such as roti, bhakari, carrots, cucumbers, apple slice, or something else and asks "Would you like to eat with your own hands?"

The child smiles at the person holding it in its hand and happily starts sucking or chewing the object in its hand.

When the child starts eating with its own hands, the caregiver praises the child using words of praise. "You're eating so well with your hands" And do you want a white or blue bowl when you're eating? It is also asked that the caregiver encourages the child to eat with his own hand. In many cases, the child is encouraged to take food from the bowl with his own hand while feeding, so that the child starts taking food with his own hand. Caregiver gives the child a spoon and encourages the child to eat with a spoon after the child has grabbed the spoon.



६ महिने ते ५ वर्षांपर्यंतच्या बालकांसाठी द्वि-साप्ताहिक लोह-फॉलिक ॲसिड सप्लिमेंटशन आणि द्विवार्षिक जंतनाशक गोळी
(अनुपालन कार्ड)

मातेला आयएफएची बाटली देण्यात आल्याची तारीख (किंवा आशाकडे घरी) IFA	बाटली १	बाटली २	बाटली ३	बाटली ४	बाटली ५
	बाटली ६	बाटली ७	बाटली ८	बाटली ९	बाटली १०

मार्गदर्शनानुसार द्वि-साप्ताहिक लोह-फॉलिक ॲसिड सप्लिमेंटशन
डिसेंबर, नोव्हेंबर, ऑक्टोबर, सप्टेंबर, ऑगस्ट, जुलै, जून, मे, एप्रिल, मार्च, फेब्रुवारी, जानेवारी

वय	आठवडा				
६-१२ महिने	१	२	३	४	५
१-२ वर्ष	१	२	३	४	५
२-३ वर्ष	१	२	३	४	५
३-४ वर्ष	१	२	३	४	५
४-५ वर्ष	१	२	३	४	५

अल्बेंडाझॉल (जंतनाशक औषध) (तारीख लिहा)

वय	१-२ वर्ष	२-३ वर्ष	३-४ वर्ष	४-५ वर्ष
डोस – १				
डोस – २				

लक्षात ठेवण्यासाठी महत्त्वाच्या गोष्टी –

१. आरोग्य संस्थेने ठरविलेल्या दिवसाप्रमाणे आशाने लोह-फॉलिक ॲसिड (IFA) सिरप द्यायचे आहे
२. ऑटो-डिस्पेंसरचा वापर करून १ मि.ली. लोह-फॉलिक ॲसिड सिरप द्यायचे आहे.
३. एखादे बालक आजारी असेल अथवा अति कुपोषित असेल तर त्याला लोह-फॉलिक ॲसिड सिरप देऊ नका
४. बालकाला लोह-फॉलिक ॲसिड सिरप नेहमी भोजनानंतरच द्या
५. लोह-फॉलिक ॲसिड सिरपची ५० मि.ली.ची एक बाटली साधारणपणे ६ महिने चालते. ती संपली की सिरपच्या नव्या बाटलीसाठी तुमच्या आशा आरोग्य सेविकेशी संपर्क साधा
६. लोह-फॉलिक ॲसिड सिरपचा डोस दिल्यावर कृपया कार्डावर ✓ ची खूण करा
७. लोह-फॉलिक ॲसिड सिरप घेतल्यावर काही समस्या उद्भवल्यास कृपया तुमच्या आरोग्य सेविकेशी त्वरीत संपर्क साधा
८. अल्बेंडाझोलची मात्रा १-२ वर्षांपर्यंत अर्धी गोळी (अल्बेंडाझोल २०० मि.ग्रा) पावडर करुन व पाण्यात विरघळून पाजावी व २ ते १९ वर्षांपर्यंत ४००mg गोळी द्यायची आहे.

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3.4 Micronutrients supplementation

Micronutrients are important for the health of children as micronutrients help the body to grow, develop and function properly. Deficiency of micronutrients can have many negative health effects.

3.4.1 Iron and folic acid

Deficiency of iron and folic acid causes anemia. Anemia is a slow-onset disease in which the ability of blood cells to deliver oxygen to the cell is reduced or lost due to low iron content in the body.

Symptoms of anemia:

- Pale Eyes, skin, tongue and nails
- Early fatigue, feeling weak/dizziness
- Chest palpitations
- Shortness of breath
- Loss of appetite
- Swelling on face, legs and body

Hemoglobin level (g/dl) to identify anaemia:

Ages 6 to 59 months	
No anemia	>11 g/dl
Mild	10 to 10.9 g/dl
Moderate	7 to 9.9 g/dl
Severe	< 7 g/dl

Causes of anemia:

- Breastfeeding gives the baby the required amount of iron up to 6 months of age. Iron is easily available to the baby from breast milk.
- Starting inappropriate complementary feeding too early, i.e. before the age of six months, (this reduces breastfeeding, provides small amounts of iron, increases the risk of intestinal infections)
- Starting supplements (iron-rich) very late i.e. after 9 months of age.
- Foods that contain low iron (such as vegetarian food) or foods that absorb iron (vitamin C), low-iron foods
- Loss of iron due to worm infestation (worms in the gut)
- Frequent diseases due to unhygienic surroundings, unhygienic conditions, unclean drinking water, personal hygiene
- Apart from this, there can be other causes of anemia in children.

To overcome this problem, Anemia Mukt Bharat (AMB) program has been launched. Children between the ages of 6 months and 59 months are given syrup of iron folic acid (twice a week) and deworming twice a year as follows.

	Age group	**Quantity**
Iron and folic acid	6 months to 59 months	1 ml Iron folic acid syrup twice a week.
Deworming	1 to 2 years	Half (1/2) tablet (200mg) once in 6 months
	Children 2 years and older	1 tablet (once in 6 months) (400mg)

It should be recorded on page 27 of the Mother Child Protection Card.

3.4.2 Vitamin A (Vitamin A)

Vitamin A is an oil-soluble vitamin that is essential for many body functions. It is essential for good vision and a healthy immune system as well as for growth and development. A total of 9 doses (6 months intervals) should be given to all children from 9 months to 5 years of age.

Sources of vitamin A:

- Breast milk is an important source of vitamin A for a baby.
- Plant sources of vitamin A include orange and yellow fruits and vegetables such as carrots, pumpkins, radishes, apricots and mangoes.
- Milk fats, butter and cheese, liver and cod liver oil, breast milk are also a good source.
- The orange/yellow pigment is obtained by provitamin A carotenoids such as beta-carotene

3.4.3 Micronutrient supplementation for low birth weight infants

- Approximately 80 percent of all child deaths in the state between the ages of 0 and 5 years occur in the first year, of which about 40 per cent die due to complications due to preterm/low birth weight (LBW).
- Such premature/underweight children have a higher chances of diseases. Their growth and development is slow and such children can soon become victims of non-communicable diseases. Continuous follow-up of these children is necessary.
- Micronutrient supplementations (Vitamin D, Iron, Multivitamin and Calcium Phosphate) should be given to low birth weight children at risk.
- All low birth weight babies should be given micronutrient supplementations as follows after they start accepting full oral feeds.

When, to what extent and how to give micronutrient supplementations to a low birth weight child is given in the table below.

Parents should be counselled by Medical officers and Health workers as well as when, to what extent and how to give the micronutrient supplementations.

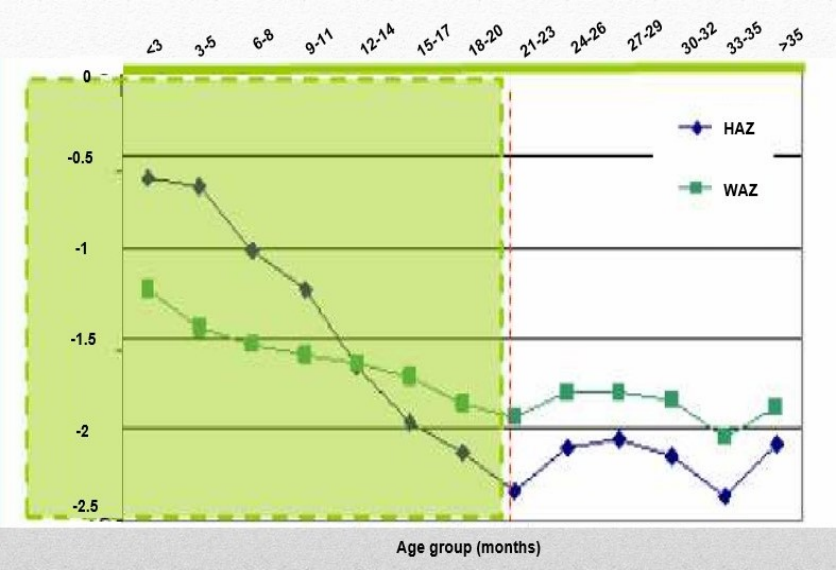
Iron	Vitamin D	Micronutrient Supplementation with Zinc	Calcium and Phosphorous
For Infants whose birth weight is less than 1500 gms, elemental iron	All low birth weight infants, who are only breastfed,	All low birth weight Infants should be given - 1 ml per day from the	Calcium and phosphorus should be given in the ratio of 120-160 mg/kg/day and 60-80 mg/kg/day respectively to infants whose

should be started at 2 weeks after birth - 2mg/Kg/day and should be given up to the age of one year.	should be given 400 IU Vitamin D per day until they become one year old	second week after birth to 40 weeks of gestational age	birth weight is less than 1500 gms. This supplement should be continued for 40 weeks of gestational age. For better result use medicine formulation of Calcium & Phosphorous in 2:1 ratio

3.5 Growth monitoring:

A child's growth is measured by the increase in weight in proportion to the child's age, length and height. Growth monitoring helps in predicting the change in weight over time. Weight and length / Height should be measured once a month until the baby is 3 years old and then once in 3 months. There are different growth graphs for boys and girls because they have different birth weight and height ratio depending on age. Their growth rate is shown in the Mother and Child Protection Card , pages 28 to 35

During the HBYC home visit, make sure that the weight of the baby is recorded on page 28-35 of the mother child protection card available with the mother, If the weight is not recorded on the card, then go to the nearest anganwadi center with the mother and take the weight & record it.

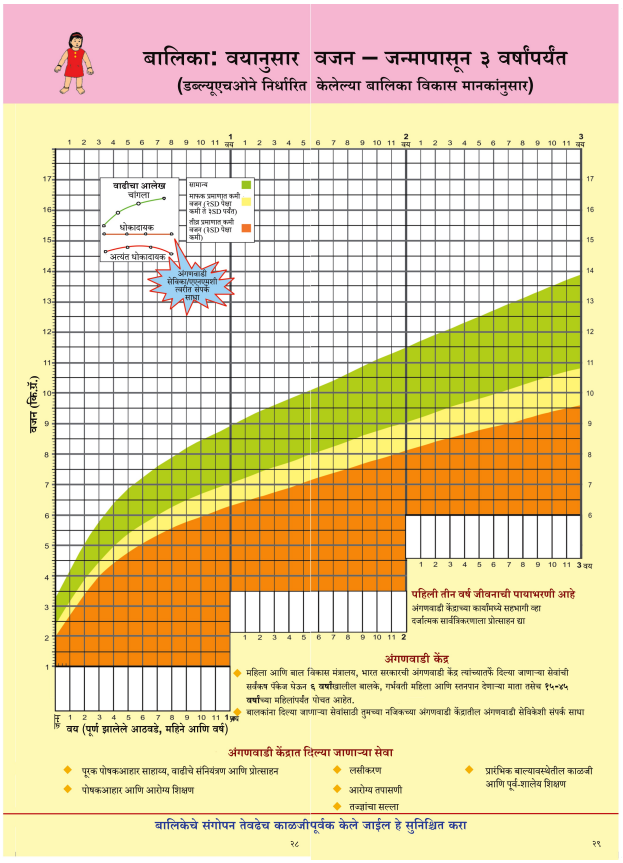


The weight of a healthy child is twice the birth weight at the fifth month of age and three times the birth weight at the time of the first birthday. When the baby is two years old, its weight is 4 times the birth weight. We must understand that the child's weight gain is not the only measure of the child's growth, the height of the child is also the measure of the child's growth. But the change in height is slower than the weight of the child.

Weight and height measurement is a useful tool for assessing the nutritional status of the child. For this, the graph sheet (weight according to age and weight according to height/length) should be used in the Mother and Child Protection Card.

As the child's nutritional needs increase with age, and if it does not get the right nutrition, the rate of stunting and wasting increases. This is proved by the following graph (source NFHS 3). The rate of stunting and wasting increases due to not starting proper complementary nutrition after 6 months. In the graph, the Z score towards "-" has increased with age.

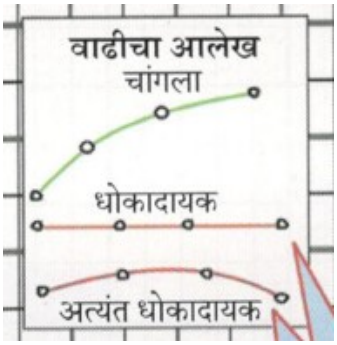
3.5.1 Underweight – Low Weight for Age of children



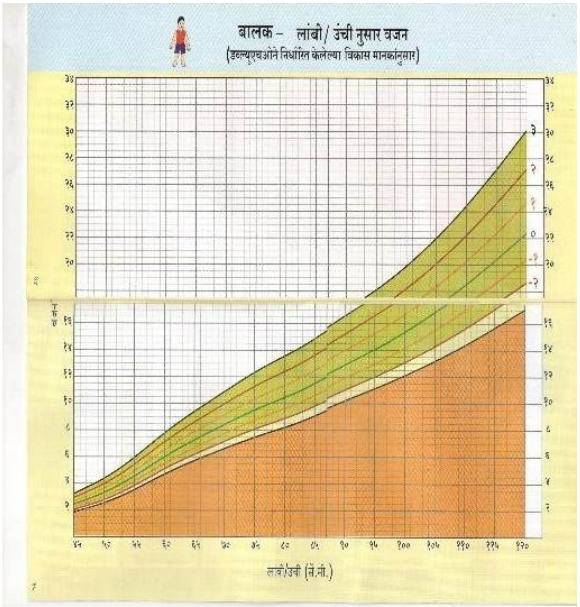
- The growth chart (weight for age) of girl child (page no. 28-29) and boy (page no. 30-31) are different in mother child protection card.
- It has the X axis parallel to the surface of the mother and child protection card, indicating the age of the child in the month and year (0-3 years). The vertical line is of each month and the bold line is of the year.
- The Y axis stands in the mother and child protection card, indicates the weight of the baby in grams and kilograms. There are horizontal lines like a line of 100 g and a bold horizontal line of 500 g and kg.
- **Colored strip:** Indicate the Nutritional status of the child
  - **Green:** Normal
  - **Yellow:** Moderate underweight
  - **Red:** Chronic low weight
  - **Faulty growth**

  Risky: Flattening growth lines, stunted growth, In such a situation, find out the causes and take measures.

  High risk: Tilting the growth line downwards, such a critical condition requires immediate intervention



- **Measuring weight:** Measuring weight with a weighing scale (preferably digital)
- **Weight marking on graph:** Marking the point of weight on the growth chart according to the age of the baby
- Draw a growth line by connecting all the marked points on the growth chart, determining the nutritional status
- Tell parents that the nutritional status is very serious if the growth line or marked point is in the red area
- Moderately or severely underweight children under 6 months of age are at serious risk of stunting, so they should be referred to a nutrition rehabilitation centre or pediatrician.



3.5.2 Wasting – Low Weight for Length/Height of children

- This indicates that the child is chronic malnourished due to a recent severe illness or a severe lack of adequate food and nutrients.
- The growth chart (weight for length/height) of the girl child (pages 32-33) and the male child

(pages 34-35) different in the mother child protection card.

- The X axis is parallel to the surface of the mother and child protection card, indicating the length/height of the child in cms.
- The Y axis stands vertical in the mother and child protection card, on which the weight of the baby is shown in grams and kilograms
- Growth Line: -3, -2, -1, 0, 1, 2, 3 SD

Colored strip:

- Green: Normal nutritional status
- Yellow: Moderate Acute malnutrition (MAM)
- Red: Severe Acute malnutrition (SAM)

- **Measuring length:** Measuring the length of children under 2 years of age with an infantometer
- **Weight graph:** Marking the point of weight on the growth chart according to the length of the baby
- Draw a growth line by connecting all the marked points on the growth chart, determining the nutritional status
- Tell parents that the nutritional condition is very serious if the growth line or mark point is in the red area. Immediate intervention needed and required to be admitted to a Nutrition Rehabilitation Centre/Child Treatment Centre or consult a paediatrician

Classification of nutritional status:

- Using weight, height/length and clinical signs and symptoms, we can classify a child as Severely Acute Malnourished and Moderately Acute Malnourished.

Severe Acute malnutrition (SAM)	Moderate Acute malnutrition (MAM)	Normal
▪ Weight for Length/ Height (WFL/H) less than 3SD and/or ▪ MUAC less than 11.5 cm (115 mm) and/or ▪ Oedema on both legs	▪ Weight for Length/ Height (WFL/H) less than -2SD and between -3SD and/or ▪ MUAC is less than 12.5 cm ▪ No Oedema	▪ Weight for Length/ Height (WFL/H) equal to or greater than 2SD and/or ▪ MUAC of 12.5 cm or greater and/or ▪ No Oedema

Acute malnutrition accompanied by medical complications such as any risk symptoms, Pneumonia, Diarrhea and other serious illnesses is called SAM with complications. These children are at risk of dying from pneumonia, diarrhoea, measles and other serious illnesses. Such children need to be referred to the Nutrition Rehabilitation Centre (NRC) immediately. Refer to the **IMNCI Training Manual** for more information.

3.5.3 Stunting - Low Height for Age of children

This indicates that children have long-term malnutrition, which is probably the result of a child not being properly nourished for a long period.

The instructor should divide the trainee into 4 groups and give each group an example and record it on the growth chart and ask them to discuss it.

E.g. 1. Jayashree's birth weight was 1.640 kg. On the third day, the baby weighed 1.600 kg . And on the 14th day, the weight of the child was 1.830 kg. The weight should be recorded on the growth chart. Identify the possible problems and do appropriate counseling. The baby's weight was 2200 grams in one month. The weight of the baby in 42 days was 2000 grams. Record the weight in the growth chart with the above information. Identify the possible problems and do appropriate counseling.

E.g. 2. Advay's birth weight was 3.100kg. At the time of discharge from the hospital, the baby weighed 2.900 kg on the third day. The weight of the fourteenth day became 3.200 kg. In the first month, the weight of the baby became 3.600 kg . In the second month, the weight became 4.250 kg. Record the weight in the growth chart with the above information. Identify the possible problems and do appropriate counseling.

E.g. 3, Sheetal had two twins. She was delivered after 34 weeks. The first baby is a girl and the second baby is a boy. The birth weight of the first child was 2000 grams and the birth weight of the second child was 1600 grams. The weight of the daughter increased to 2460 grams at the end of the first month and the weight of the second baby became 1945 grams. The weight of the first baby in the second month was 2825 grams and the weight of the second baby was 2230 grams. Record the weight in the growth chart with the above information. Identify the possible problems and do appropriate counseling.

E.g. 4 Tushar's birth weight was 2800 grams. Tushar weighed 6 kg when he was 6 months old. The seventh month weight was 6455 grams. The 8th month weight was 6905 grams. The ninth month weight became 7400 grams. Record the weight on the growth chart. Identify possible problems and seek appropriate counseling.

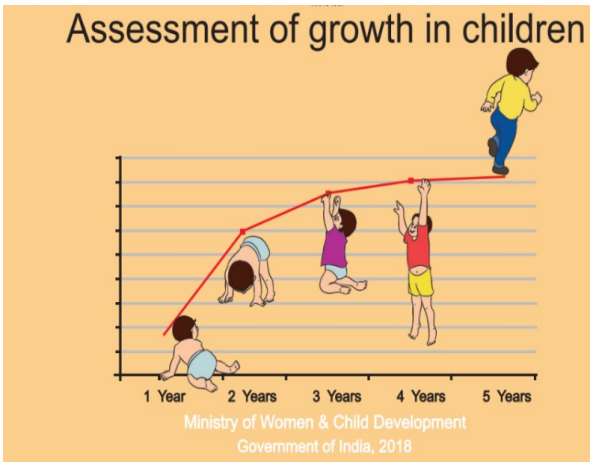
Key message:

- Growth and development go hand in hand .
- From birth, if the child gets proper nutrition, health, encouragement, play, communication, safe environment, love, affection in abundance then the child will grow and develop overall.

The trainer should ask the trainees to distinguish between growth and development and conduct a discussion. Take the points given below and explain the difference between growth and development through the game. For this, the trainer should ask the trainees to stand in two parallel rows facing the coach. The rule of the game is that if the sentence is related to growth, the trainees should jump to their right and if the sentence is related to development,the trainees should jump to their left. The instructor should read each sentence and discuss the topic of 'Growth and Development' in detail after each sentence.

Growth and development issues

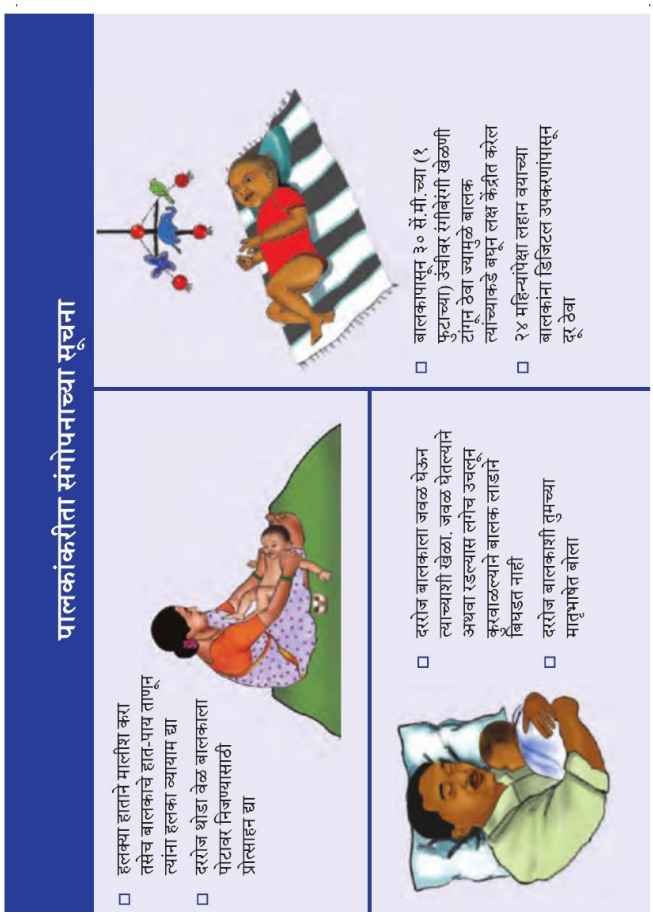
- 9-month-old Minu was suddenly seen by her mother playing horse-horse on both knees one day. **(Development)**
- 10 months old Nilesh stood using the support of the table in the house. **(Development)**
- 3-year-old Megha looked tall**. (Growth)**
- 1-year-old Aditya started standing without support. **(Development)**



- 8-month-old Neetu started looking healthy. **(Growth)**
- 25-month-old Saket refuses when asked to do anything. **(Development)**
- One morning, 7-month-old Rehan's teeth started appearing. **(Growth)**
- 3-year-old Rakesh was able to ride a new three-wheeler within 15 days of being introduced. **(Development)**
- 2-year-old Surabhi has a total of 20 milk teeth in her mouth. **(Growth)**
- 4-year-old Simran helps her 2-year-old brother get down the staircase by holding his hand. **(Development)**
- 3-year-old Rohit could button his shirt. **(Development)**
- One and a half years old Sarita eats with her own hands. **(Development)**

4. Responsive Caregiving

The early stages of a child's life are very important in terms of development. If the child receives proper love and care then the child develops properly. For this, it is very important to identify the child's needs. The child may have many needs, e.g. hunger, playing, talking, touch of love, cleanliness, changing wet clothes, etc. The child may have various needs like s/he may be hungry, wanting to play, communicate, need cuddling, or demanding for changing the wet clothes, etc. Responsive caregiving includes identifying, and acknowledging these cues/needs of the child and respond accordingly. It is not only important to spend time playing and talking with the child, but also to recognize her/his feelings and respond to the needs.



Instruction for facilitator: Raising a child does not merely mean meeting needs but being responsive to the child's every cues and needs. Mother and Child Protection (MCP) Card Page nos. 12, 14, 16, 18, 20, 22, 24 have age-appropriate parenting tips which should be used during home visits as well as for counselling by the healthcare providers to educate the caregivers for strengthening parenting practices.

During the training, the importance of responsive caregiving should be discussed in depth based on the following points.

- The child does not continue doing any one action for a long time. Immediately after one action, parents should not ignore another action by the child. The child learns a new thing through every action.
- Responsive caregiving recognize the child's feelings and respond to his/her actions.
- If the child's curiosity is to be maintained, it is necessary to respond to the action generated by the child as it provide an opportunity to take new actions.
- Caregivers should respect their child's feelings from an

early age.

- Positive effects of sensitive parenting on the child

  - Encouraging a child's actions increases curiosity.
  - The child learns to think from a broader perspective.
  - The child develops a strong and affectionate relationship with the other person
  - It helps to develop good habits in a child.
  - Encouraging a child's actions increases enthusiasm.
  - Helps a child become a responsive person in the future

5. Early Learning Opportunities

The learning is inherent in the humans and begins at conception. In the early years, child achieve certain milestones such as social smile, eye-rolling, language skills, imitating, playing simple games, and skills and gestures like "waving bye-bye" through interaction with other people. By playing with household level things like cooking utensils, colourful clothes etc., child learns touch, shape, forms, quality and how to handle these things. Interacting while performing daily activities like feeding, bathing, helps the child develop. We can provide learning opportunities as early as possible through proper touch, talk and play.

5.1 Touch: Right from birth, the child wants someone to talk to, to cuddle and to respond to it. These are the most important needs of the child. When the caregiver holds the child close, lifts her/him up, smiles, hugs, kisses, and caresses the child, s/he gets the right touch through all these activities and s/he feels safe and this helps in the child's brain development.

5.2 Talk: Young children need constant appreciation and encouragement. Start talking to the child right from conception. Respond to the child's language cues right from the birth. Smile and imitate its voice and gestures and communicate with the child.

5.3 . **Play**: The play has a crucial role in child's development. The caregiver can help the child develop many new skills by giving various household items.

Key message

- Age-appropriate play and communication activities are very important for the overall development of the child.
- Child does not want the play toys but play is essential for its brain development.
- It is important to explain the brainy background of any play to the caregivers and other family members.
- "Sensitivity and responsiveness are two things that are important to be aware while playing and communicating.
- The caregiver should focus on how the same play activity can be raised one step difficult to boost a child's intelligence.
- Make maximum use of household items for play and communication' activities.
- All family members should be included in child's play activities.

6. Safe Environment

Physical and emotional safety is important for the child's brain development. The child is vulnerable to various burns, cuts, falls, hurting, scratches, etc., as well as emotional trauma such emotional neglect, speaking disrespectfully to the child, constant anger, beating, household dysfunction, substance abuse by family members, etc. can hinder the child's brain development.

6.1 Physical safety: Children are generally at risk of accidents, such as burns, cuts, falls, scratches, etc. Injuries sustained in accidents are particularly responsible for death. Young children are mostly injured in the home or in the vicinity of the house.

Counseling on child safety -

Children learn through games. They need a clean, safe and protected physical environment to avoid accidents and injuries. Parents need to be informed about the following safety measures:

I) Wash and keep the child's toys clean.
II) While playing, let the child play on a clean sheet or mat and in a clean environment.
III) Do not keep small objects near children. Children can put them in their mouths and are prone to swallowing sharp, thin and small objects. Keep such things away from children.

6.2 Emotional Security:

It is very important for the family members, relatives and those around them to take care of the emotional environment for the development of the child. Adults should respect that the child has her/his own opinion. Children should be protected from violence or loud anger so that the child's confidence increases and they learn by absorbing new things.

In order to provide physical and emotional security to the child, the following should be avoided.

- Stress in mother
- Addictions in family members
- Fights at home
- Talking disrespectfully to adults
- Bad relations with family and neighbours
- Having other items/objects like scissors around the child.
- To have tin sheets (sharp metal objects), open wells, etc . in the vicinity of the house.

7. Routine Immunization

Immunization protects children from various diseases, so it is necessary to regularly immunize the children according to their age. This information about immunization like routine immunization session days, further doses or remaining doses should be given during home visits, mother meetings. Also, while preparing the list of expected children in the area, drop out and left out children should be tracked and immunized. Health workers are required to report information about the vaccine given to the child based on page numbers 36 and 37 of the Mother and Child Protection (MCP) Card. Also, they must fill the information on page no. 39 and 40, and cut the counterfoil with a scissor and place it in a tracking bag at the session site.

8. Developmental Delays and Disabilities

Developmental delays can be identified from birth or at a very young age. Developmental delays are sometimes easily visible and sometimes they can be delayed in appearance. Developmental delays affect a child's daily functioning. According to the World Health Organization, 1 in every 12-20 children may have developmental delay.

If children do not have the right development opportunities, it becomes difficult for them to reach the their potential, which affects their growth and development. Therefore, it is necessary to give them different opportunities to develop different skills.

Developmental delay	**Disability (Divyangs)**
Developmental delay occurs when a child does not achieve developmental milestones in comparison to peers of the same age range.	Any impairment in any one or more domains of development which will affect the daily functioning and growth of the child.
Children can catch up from delays if given required early stimulation.	Disabillity is lifelong, children cannot catch up from it, but they can be helped to progress and thrive.
All developmental delays do not lead to disability, but if not identified early, they can affect the child's cognitive and physical development.	Most children with disabilities will exhibit several developmental delays within the first two years of life. Hence, early identification of delays will help in identifying and reducing the level of impairment in the child.

When working for early childhood development, we often find children with developmental delays. sit is difficult to reach a level of development in a particular field compared to peer ,For some children of the same age range.

8.1 Possible causes of developmental delay and disability in children

Before birth	**At birth**	**After birth**
- Fetal malnutrition (IUGR) - Maternal blood pressure, diabetes, anemia - Infection - Maternal addiction, malnutrition, physical and mental illness - Domestic violence (physical or mental) - Genetic factor: marriage within the family (or extended family) - younger / elderly mother and unplanned or unwanted pregnancies	**Maternal health during delivery such as** - Anemia, high blood pressure, infectious diseases, etc. - Premature births - Babies with low birth weight - Babies who don't cry immediately after birth - Complications during labor (injury to the baby, a umbilical cord wrapped around the baby's neck) - Infection at birth	- Domestic violence (physical or mental) - Lack of cleanliness - Lack of opportunities for play and communication - Accident or injury to a child - Malnutrition (vitamin A deficiency, iron deficiency) - Neonatal Jaundice

Under AAAA+S, health workers (ANMs), Anganwadi workers (AWWs), ASHA, AYUSH doctors (CHOs), Sarpanchs can play an important role. Responsivity and sensitivity to the child isneeded to promote child development. There are individuals at the village/ward level who can listen to and communicate with the child's emotions and family problems by properly observing the stage of development as they grow. At the same time, guidance can be given to families on what care can be taken to prevent developmental delay, as well as what efforts families can make to develop a child once a developmental delay is diagnosed.

8.2 Developmental delay and prevention of disability in children.

- Taking complete care of the mother during pregnancy and consumption of folic acid and iron tablets, calcium tablets regularly
- Staying away from a person with severe infection during pregnancy
- Special care for high-risk pregnant mothers
- No medicine without medical advice during pregnancy
- Eating a whole nutritious diet during pregnancy and postpartum period
- Protecting the child from brain injury during labor
- Preventing exposure to chemicals, pesticides, and other toxins (e.g., toilets, bathroom cleaners) by any means during pregnancy.
- Protecting the newborn from infections
- Identify danger signs in newborns and treat them promptly
- Fully vaccinating the child
- Exclusive breastfeeding for the first six months of the baby and continued breastfeeding for at least two years.
- Inclusion of maximum food components in complementary feeding. Increase the amount, density, frequency and variety of food as the child grows older.
- Keeping chemicals, pesticides, other toxins (e.g. toilets, bathroom cleaners), sharp-edged objects, pills, fireworks, etc. away from children and explaining the potential dangers to children in a way that makes them understand correctly.
- When some children are late in reaching a certain developmental stage or learning certain skills late, such as eating with their own hands, dressing, etc., parents need to give the child time and encouragement to develop these skills. Otherwise, this developmental delay in children may be partly the cause of disability.

Key message:

If there is a delay in reaching a developmental stage for 1-3 months in young children, it does not mean that it is a sign of danger. Every child has a pace of growth and development and if given the right encouragement, they can usually reach developmental milestones at the right time. In such a situation, there is no need for families to panic, but as components of AAA+S and RBSK, we need to take appropriate measures for the child. Encourage and support the family to develop their skills rather than focusing solely on the child's developmental delay.

Children with developmental delays and disabilities face more difficulties because of the way their families and society view and treat them.

The needs of these children are the same as those of normal children. It is equally important to treat them with love and respect. It is equally important to allow these children to live together with other children, to play, to do daily activities, to participate in social activities. This will provide them with ample opportunities at the family and social level to develop them holistically like other children. In order to create a place for children with delay and disability, individuals in the community such as parents of such children, AAA+S, other prominent individuals in the community, children with developmental delay and disability, as well as ordinary children need to identify and respond to the special needs of such children.

8.3 Attitude toward developmental delay and disability in general at the family and social level.

1. Children with developmental delays and disabilities are often viewed from a conservative perspective. For example, if a disabled child is in the village, it is assumed that the disability of this child is the result of wrong deeds of the previous birth.

2. Parents often assign the responsibility of caring for children with developmental delays and disabilities to someone else, e.g., orphanages.

3. Children with developmental delays and disabilities are criticized for their disabilities or are spoken to in such words that they lose their self-esteem.

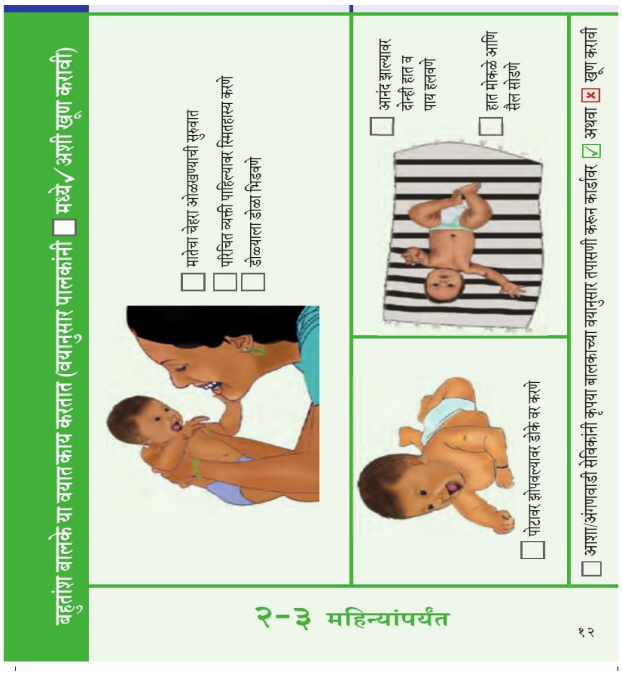
4. Family and community responses depend on developmental delays and severity of disability.

5. Children with developmental delays and disabilities may be at risk from both neglect or over-caring.

However, due to wrong beliefs and misconceptions about developmental delay and disability, such children are often unable to get proper treatment at the right time. In addition, due to excessive care, these children are not able to learn essential skills. As a result, these children are not able to achieve their full growth and development. As a result, sometimes premature death of such children is possible.

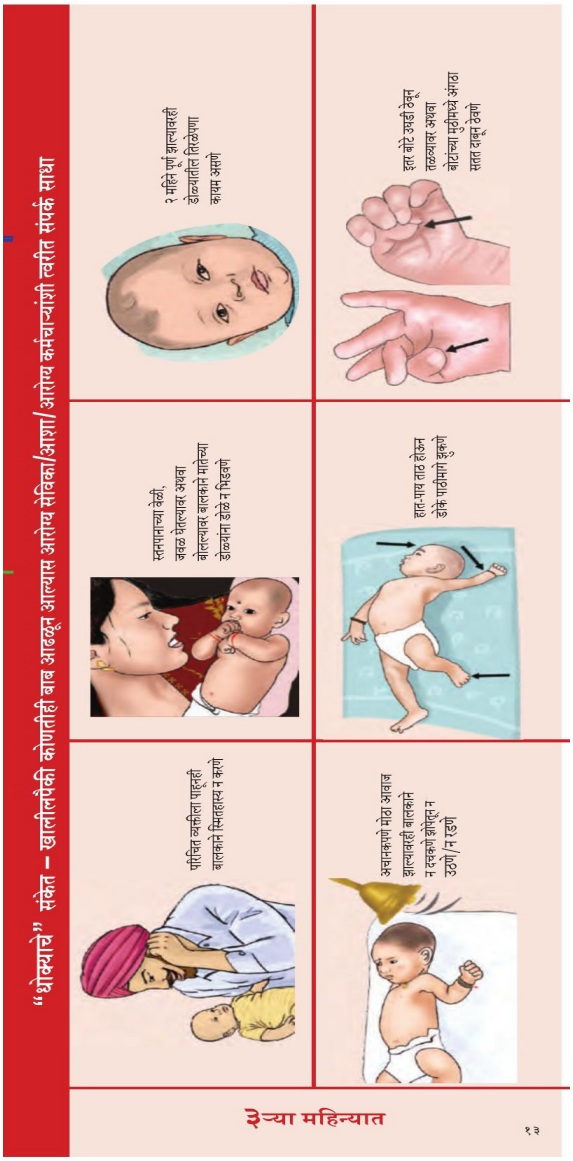
8.4 Identifying developmental stages in children with the help of mother and child protection (MCP) cards.

- Pages 12-25 of the Mother and Child Protection (MCP) Card provide information about the stages of child development according to age, as well as the danger signs of development in children and instructions for parenting.
- This entire information is in an illustrated format.
- The age groups are divided into seven groups i.e. 2-3 months, 4-6 months, 7-9 months, 10-12 months, 18 months, 24 months and 3 years.
- It is necessary for the child to reach developmental stages in various domains according to age



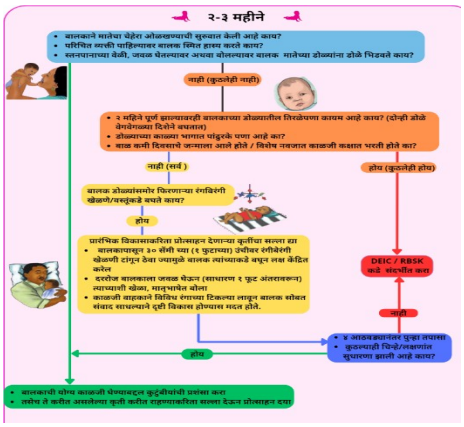
- The Mother and Child Protection Card in red indicates the danger of not reaching developmental milestones as per age .

Domain	Developmental stages	Age group
Physical milestone Gross/fine	Raising your head while lying on your stomach (gross)	2 to 3 months
	Picking up the toy using all fingers	7 to 9 months
Social and emotional milestones	Smiling when you see an acquaintance	2 to 3 months
Stages of hearing development	Suddenly a loud noise causes the child to wake up/cry	2 to 3 months
Read and language development stages	Utters simple words like Pa.. Pa... Pa.. Ma Ma.. Ma Baa..... Ba.. Ba....Ba	7 to 9 months
Cognitive learning, Thinking & problem solving	Reacting to or seeing when called by name	7 to 9 months



8.5 Guidelines for ASHA to identify developmental delays in children

A guide for ASHA has been developed to identify developmental delays in children using 7 age groups information from the Mother and Child Protection Card. The guide contains questions about a child's development in different domains according to age.



- The answers are in yes/no format. Information is given about what should be done if the answer is yes and what other questions to be asked if the answer is no.
- Based on this information, actions that encourage early development can be given to the caregiver.
- There is also clear information about when should the child be referred to DEIC/RBSK upon noticing certain warning signs.
- Using this guide, medical officers and health workers should identify developmental delays in children as soon as possible and give appropriate advice to parents and families in a timely manner.

8.6 District Early Intervention Centres (DEIC)

RBSK was launched in 2013. RBSK is an important step taken under the Ministry of Health and The National Health Mission to promote early screening and treatment of children. RBSK covers children in the age group of 0-18 years. In RBSK, screening of children is done for 4Ds. This includes:

1) D: Defects at birth

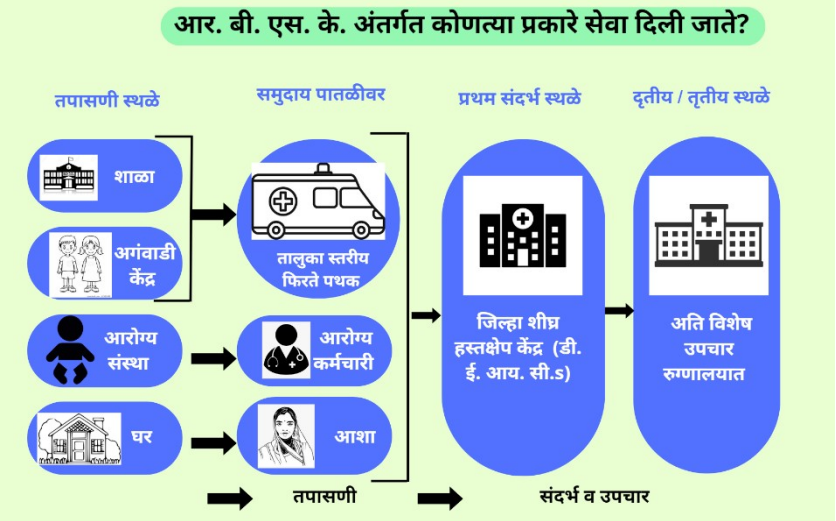
2) D: Disease:

3) D Deficiencies: Micronutrient Deficiencies

4) D Development delays:

Children who are diagnosed **with any of the 4Ds** are referred to the next level for free treatment. Also, 4Ds in children in the age group of 0 to 18 years are screened by ASHA at home level, health officer/staff at health institution, at anganwadi and school level by mobile health teams. All these detected children are referred to DEIC centres for further treatment. Children who need higher treatment are referred through DEIC to the higher centers.

DEIC stands for District Early Intervention Centre. D. E. I. C. is a part of R. B. S. K. program. DEIC is a health facility having group of experts / therapists who work together for 4Ds on children aged 0-18 years.



The purpose of DEIC is to evaluate and manage all children below the age of 6 years by providing medical therapy, physiotherapy, psychological therapy , vision and hearing therapy , dental therapy , nutritional therapy, plaster therapy under one roof. It also provide referral support for children requiring surgery or are above the age of 6 years provide referral support to children identified with health conditions during health screening by RBSK Mobile Health teams. Treatment is provided free of charge.

RBSK - The RBSK mobile team includes all services such as detection of 4Ds in children in the age group of 0-18 years, providing referral services, providing treatment through DEIC and referring children to higher centres if further treatment is required, follow-up of children. The DEIC centre is located at the district headquarters at district general hospital or a women's hospital.

Scan the following QR code to see the complete 'Guide to ASHA for Identifying Developmental Delays in Children'.	
Add the topic of skills for caregivers. Scan the following QR code for details of the subject.	
Scan the following QR code for detailed information on DEIC (District Rapid Intervention Centre) and RBSKY.	