

Standard Treatment Guideline & Essential Medicine List

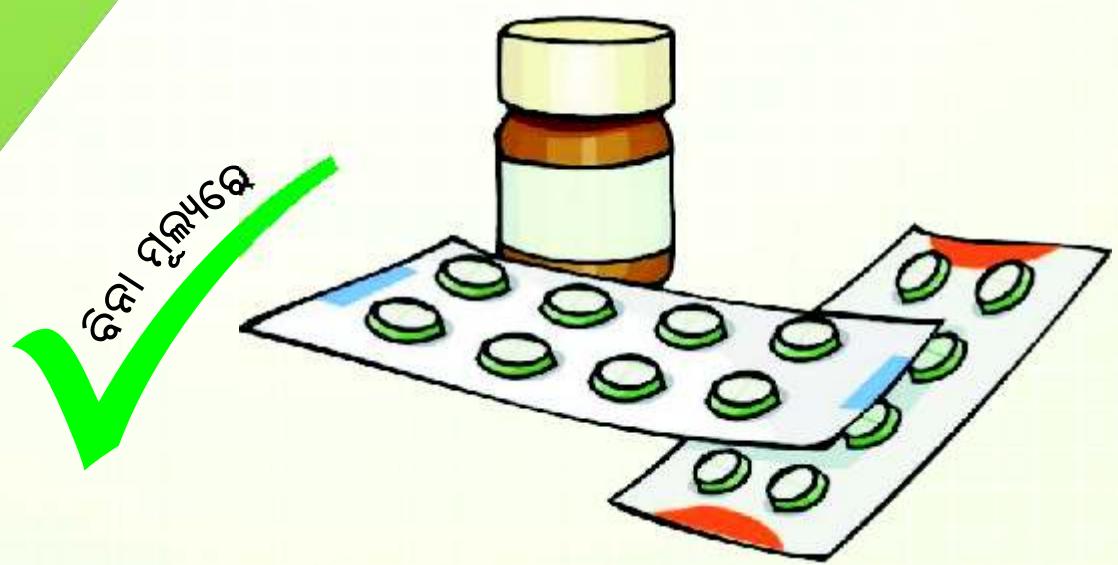


JANANI SHISHU SURAKSHA KARYAKRAM



**HEALTH & FAMILY WELFARE DEPARTMENT
GOVERNMENT OF ODISHA**





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Standard Treatment Guideline & Essential Medicine List (For Pregnant Women)

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PREFACE

Our nation has made progress in almost every field and we are marching ahead. In medical science we are no less developed than the developed world. All kinds of treatment involving high technology and skill are available with us.

However, high maternal mortality is a blotch on the face of our nation in spite of the development story. The MMR of our country is 254 and for our state is 303 (SRS-2009) at present as per the latest reports of September, 2010 Ministry of Health & Family Welfare, Government of India. This recent improvement is because of innovative schemes and programmes like JSY, which provides incentives for institutional delivery. Maternal mortality is mainly due to haemorrhage (including APH, PPH and ruptured uterus), Hypertension (including pre-eclampsia and eclampsia), sepsis and anaemia. The social factors contributing to maternal mortality include the delays as follows:

First delay: Delay in identifying a complication and in taking decision to seek care (at the level of individual and family).

Second delay: Delay in reaching care (at the level of community and system).

Third delay: Delay in getting care at the health facility.

Hence to reduce MMR further, to below 100 we need to deal with the problem comprehensively medically as well as socially. Medical interventions include pre-conceptional health care, proper antenatal care, institutional delivery and contraception to space pregnancies and limit family. To deal with the social factor the all-new JSSK (Janani Sishu Surakhya Karyakram) is being launched to facilitate and provide incentives for the above so that there is no delay in seeking care.

On this occasion this booklet has been released. This booklet includes topics mainly keeping maternal mortality in view. It is not meant to replace any ideas but only to refresh knowledge and ideas. Hope this will be of great help to our colleagues dedicated to the service of pregnant women.

A. K. Behera

Dr. P. C. Mahapatra
PRESIDENT, FOGSI.

Message



Last few decades has witnessed tremendous advances in the conceptual knowledge, technological revolution as well as drastic change in the management of various ailments in medical science in general and maternal health and new born care in particular. With the emergence of advances in the practice of obstetrics & gynaecology lot of controversies has evolved in various segments. This creates a lot of unethical and unscientific approach to management in day to day practice. Hence a need for a protocol or good clinical practice guideline is absolutely required. Viewed in this context this guideline of JSSK (Janani Shishu Surakhy Karyakram) was evolved targeting the important clinical issues on maternal health & new born care to update the knowledge and skill of doctors practising in the various primary as well as referral centers to have rational and ethical practice which serves as a scientific basis to treatment and certainly will have an impact on uniformity in practice in all over the state. I congratulate the department of Health & Family Welfare, Govt. of Orissa, NRHM, Directorate of Health Services, Directorate of Family Welfare, and Directorate SHFW for their initiative in bringing out this important document for the benefit of the doctors which will serve as a bible for all time to come. It will certainly have a positive impact on the maternal health issues & new born care.

I wish best of health for all my mothers & new born.

A handwritten signature in black ink, appearing to read "P.C. Mahapatra" followed by a date like "19/10/11".

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FOREWORD

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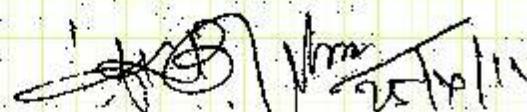
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limit family. To deal with the social factor the all new JSSK (Janani Sishu Surakhya Karyakram) is being launched to facilitate and provide incentives for the above so that there is no delay in seeking care.

On this occasion this booklet has been released. This booklet includes topics mainly keeping maternal mortality in view. It is not meant to replace any ideas but only to refresh knowledge and ideas. Hope this will be of great help to our colleagues dedicated to the service of pregnant women.

Further I take this opportunity to thank my colleagues Dr. P. C. Mahapatra, Professor and President FOGSI, Dr. Subhra Ghosh, Dr. Sasmita Swain, Dr. Kirtirekha Mahapatra, Associate Professors and Dr. Leesa Mishra and Dr. Sujata Swain, Assistant Professors for their hard work during the preparation of these treatment guide lines.



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1. ANTENATAL CARE

Systematic supervision of a woman during pregnancy is called antenatal care. It provides therapeutic interventions known to be effective; and education to the pregnant women about planning for safe birth, emergencies during pregnancy and how to deal with them.

BASIC ESSENTIAL CARE RECOMMENDED FOR ALL PREGNANT WOMEN

Number of check-ups:

All pregnant women must be counselled for regular antenatal visits in the following manner

- ❖ Minimum one visit in first trimester
- ❖ Monthly visits till 32 weeks
- ❖ Every 2 weekly till 36 weeks and
- ❖ Weekly visits till delivery

However it must be ensured that every pregnant woman makes at least 4 visits for ANC including the visit for registration as soon as she suspects that she is pregnant. The second visit should be between 24 – 28 weeks. The third one should be planned at 32 weeks and fourth one at 36/37 weeks.

Investigations:

All pregnant women must have the following investigations done during pregnancy as a part of the antenatal care

Blood :

- Haemoglobin at initial visit to be repeated at 28 weeks in normal cases but in anaemic cases, it should be done every 30 days.
- Grouping and Rh Typing.
- VDRL (1:8 dilution)
- ICTC (Integrated Counselling & Testing Centre)
- Blood sugar
- FBS at first visit and GCT (estimation of blood sugar after one hour of 50 gm. glucose irrespective of fasting status) between 24 to 26 weeks.

Urine examination :

- Routine & microscopy with albumin & sugar should be done.
- A repeat urine examination to be done in third trimester.

Stool examination

Ultrasound Examination

- At least one Ultrasound examination should be done between 16 - 20 weeks of pregnancy to exclude congenital anomalies.

Immunization

As an integral part of antenatal care all pregnant women must be immunized with two doses of Tetanus Toxoid Inj. 0.5 ml/ dose deep I.M. in the upper arm. The first dose just after first trimester or as soon as the woman registers for ANC, whichever is later. The second dose one month after the first dose but at least one month before EDD.

Iron and Folic Acid (IFA) and Calcium Supplementation

All pregnant women need to be given iron folic acid tablets (100 mg elemental iron and 0.5 mg. folic acid) every day throughout the pregnancy period & elemental calcium 1000 mg every day after first trimester.

IEC

All pregnant women should ideally be provided with information, counselling and education on nutrition, diet, hygiene, newborn care and contraception. She must also be counselled to undergo HIV testing.

First Visit

First visit needs to be earlier in pregnancy (prior to 12 weeks). Woman is provided information, with an opportunity to discuss issues and ask questions. She is offered information verbal and written on topics such as nutrition, diet, lifestyle considerations, available pregnancy care services, maternity benefits and sufficient information to enable informed decision making about screening tests.

Woman is to be asked about

- Age
- Any symptoms/discomfort

Menstrual History:

- L. M. P from which E. D. D. is calculated.
- Nature of previous menstrual cycles.

Obstetric History:

- What gravida and para she is.
- Whether she had any earlier abortions.
- History of previous pregnancies in detail with attention to any bad obstetric performance.
- Birth interval between pregnancies and duration since last childbirth.
- History of any systemic illness or history of reaction or allergy to any drug or any addiction.

Physical Examination:

The methodology will be same in all subsequent visits. The purpose is to confirm the diagnosis of pregnancy and to take base line readings to compare with subsequent findings.

General Examination: Particular importance is attached to

- ❖ Height.
- ❖ Weight.
- ❖ Gait.
- ❖ Pallor.
- ❖ Oedema.
- ❖ Icterus.
- ❖ Lymphadenopathy.
- ❖ Pulse.
- ❖ Blood Pressure.
- ❖ Thyroid examination.
- ❖ Breast examination.

Systemic Examination:

- ❖ Respiratory System
- ❖ Cardiovascular System and
- ❖ Other systems

Abdominal Examination:

Depending on the duration of gestation at the time of first visit abdominal examination will be done. If the woman has come before 12 weeks, there will be no finding, as the uterus becomes an abdominal organ only after 12 weeks of pregnancy.

Pelvic Examination:

Per speculum, vaginal and bimanual examination is done wearing sterile latex gloves in both hands to look for signs of pregnancy, which are:-

- ❖ Bluish colouration of vaginal walls and cervix, softening of cervix and the uterus
- ❖ Enlargement of the uterus size depending on the duration of pregnancy

Investigations:

All pregnant must have the following investigations done during pregnancy as a part of the antenatal care

Blood:

- ❖ Haemoglobin at initial visit to be repeated at 28 weeks in normal cases but monthly in anaemic cases.
- ❖ Grouping and Rh Typing.
- ❖ VDRL
- ❖ FBS at first visit
- ❖ GCT (estimation of blood sugar after one hour of 50 gm. glucose irrespective of fasting status) between 24 to 26 weeks. Value ≥ 140 mg/dl is taken as cut off for doing GTT.

Urine examination:

- ❖ Urinary pregnancy test, only in case of doubt, in very early pregnancy (< 6 weeks)
- ❖ Routine & microscopy with albumin & sugar should be done.
- ❖ A repeat urine examination to be done in third trimester.
- ❖ Culture and sensitivity in selected cases

Ultrasound Examination:

If practicable it should be done around 8 weeks of pregnancy as it goes a long way in confirmation of gestational age.

16 – 24 Weeks

Woman is to be asked about -

- ❖ Any symptoms or discomfort

Physical Examination

- ❖ General & Systemic Examination (as mentioned earlier)

Abdominal Examination

- ❖ Height of the fundus of the uterus (to be compared with gestational age)

Investigations

- ❖ Blood Haemoglobin Urine for proteins and sugar if not already done. Ultrasound examination to exclude foetal anomaly.

24 -32 Weeks

Woman is to be asked about

- Any symptoms or discomfort

Physical Examination

- General & Systemic Examination (as mentioned earlier)

Abdominal Examination

- Height of the fundus of the uterus (to be compared with gestational age)

- Foetal Heart is to be auscultated

- Symphysio-fundal height & abdominal girth is taken and recorded

Investigations

- Blood Haemoglobin

- Urine for proteins and sugar if indicated

- Blood GCT (Glucose Challenge Test as described earlier)

32 - 36 Weeks

Woman is to be asked about

- Any symptoms or discomfort

Physical Examination

- General & Systemic Examination (as mentioned earlier)

Abdominal Examination

- Height of the fundus of the uterus (to be compared with gestational age)
- Lie, Presentation and Position of the foetus is to be noted
- Foetal Heart is to be auscultated
- Symphysio-fundal height & abdominal girth is taken and recorded

Investigations

- Blood Haemoglobin
- Urine for proteins and sugar if indicated

36 - 40 Weeks

Woman is to be asked about

- Any symptoms or discomfort

Physical Examination

- General & Systemic Examination (as mentioned earlier)

Abdominal Examination

- Height of the fundus of the uterus (to be compared with gestational age)
- Lie, Presentation and Position of the fetus is to be noted
- Foetal Heart is to be auscultated
- Symphysio-fundal height & abdominal girth is taken and recorded
- Clinical assessment of amniotic fluid volume is done.

Pelvic Examination:

- Cervical condition (whether it is ripe or not)
- Pelvic assessment

Investigations

- Blood Haemoglobin
- Urine for proteins and sugar if indicated
- Ultrasound examination for Bio-physical profile

After 40 weeks

Woman is to be asked about -

- Any symptoms or discomfort

Physical Examination

- General & Systemic Examination (as mentioned earlier)

Abdominal Examination

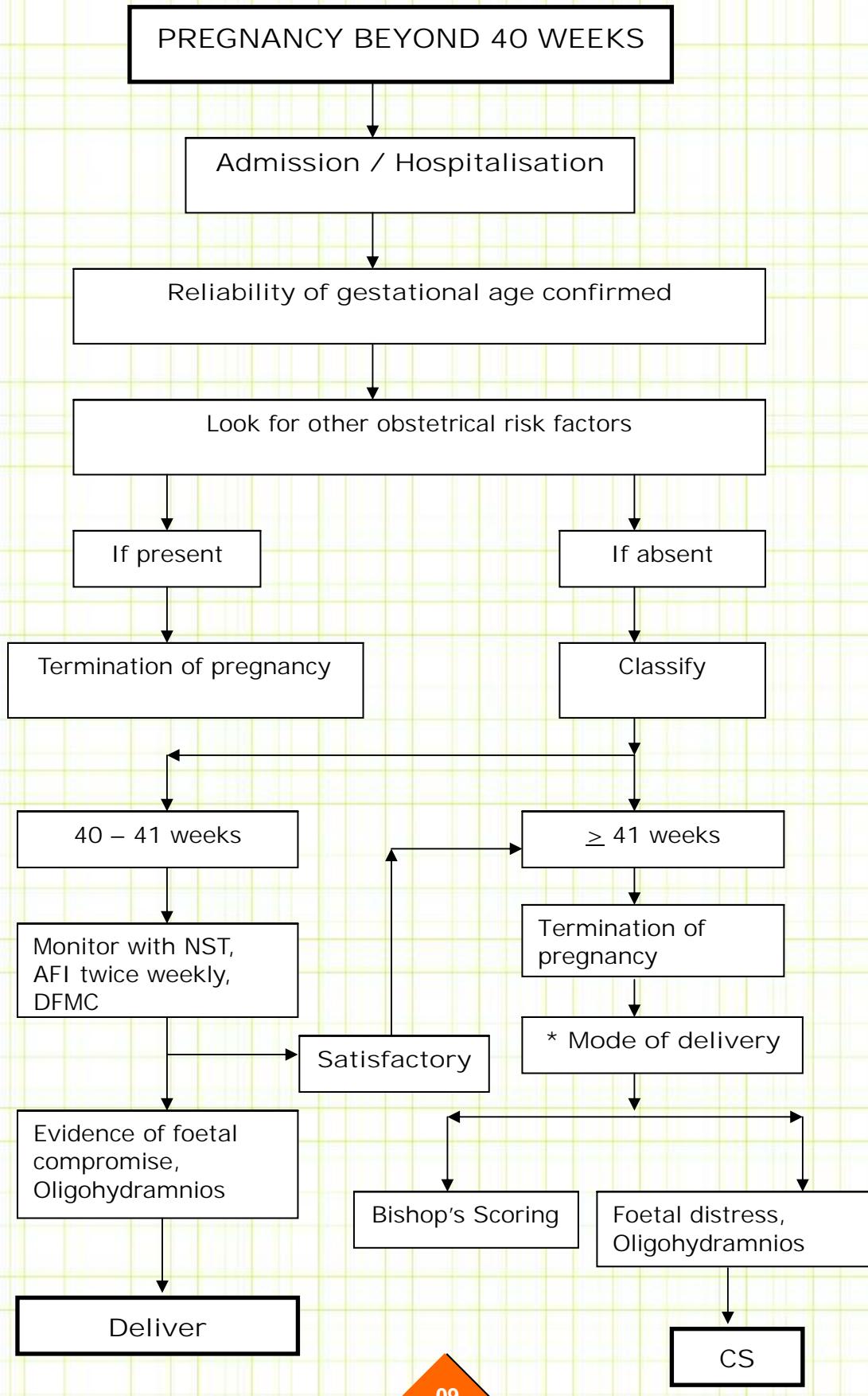
- Height of the fundus of the uterus (to be compared with gestational age)
- Lie, Presentation and Position of the fetus is to be noted
- Foetal Heart is to be auscultated
- Symphysio-fundal height & abdominal girth is taken and recorded
- Clinical assessment of amniotic fluid volume is done.

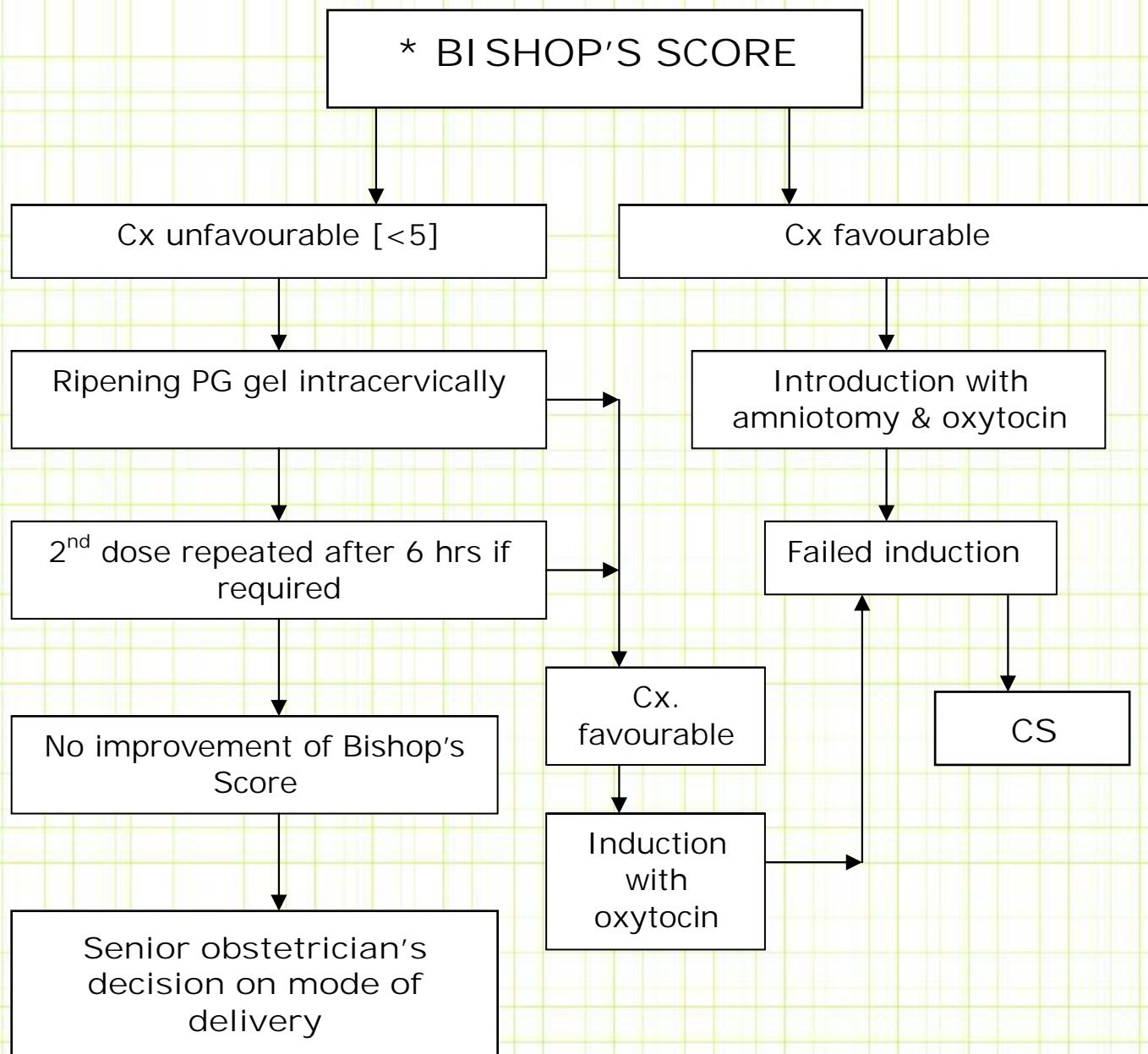
Pelvic Examination:

- Cervical condition (whether it is ripe or not)
- Pelvic assessment to rule out CPD.

Investigation

- Urine for proteins and sugar if indicated
- Ultrasound examination for Bio-physical profile at least twice a week





DRUGS USED IN ANC

Up to 12 weeks:

- Folic acid: 5 mg /per day × 90 days

16 -40 weeks:

- Iron and Folic Acid (Elemental Iron 100 mg + Folic Acid 0.5 mg./day)
- Calcium: 1000mg./day
- Inj. Tetanus Toxoid I.M. 2 doses at interval of one month

Patient Education

Healthy Diet:

- Green Leafy vegetables, Pulses, Soybean, Fruits and Salads, Milk, Egg, Fish, water and Juices 8 glasses per day (more in summer). No extra salt to Hypertensive women_.

Exercise:

- Continue Routine work, however light exercise can be done. No Heavy Exercise or Work in last few weeks.

Rest:

- Sleep for 8 hours at night, 2 hours rest in the afternoon, Lie on left lateral after 20 wks.

Sexual Intercourse:

- Prohibited in normal Pregnancy during first trimester and late pregnancy and in all abnormal pregnancy conditions.

Addiction:

- Tobacco or Alcohol intake should be stopped.

Medication:

- No drug should be used in the first 16 weeks unless absolutely necessary. (Anti - T.B., Anti- epileptics should be continued)

Danger Signals:

Immediate Medical Attention must be sought in cases of any of the following i.e. Acute Abdominal Pain, Vaginal Bleeding, Persistent Vomiting, Fever, Oliguria, Swelling of face and fingers, Persistent severe swelling of ankles, Severe continuous Headache, Dizziness and Blurred Vision, Loss of Foetal Movements and Watery Vaginal Discharge.

HIGH RISK PREGNANCIES [Women requiring additional care/referral]

Women who have experienced any of the following in previous pregnancies

- Recurrent pregnancy loss
- Preterm birth
- Severe pre-eclampsia
- HELLP syndrome or eclampsia
- Rhesus isoimmunisation or other significant blood group antibodies
- Uterine surgery including caesarean section
- Myomectomy or cone biopsy
- Antepartum or postpartum haemorrhage
- Previous MROP
- Puerperal psychosis
- A baby with a congenital anomaly (structural or chromosomal)

Women who have the following in present pregnancy

- Underweight (BMI less than 18 at first contact)
- Obesity (BMI 35 or more at first contact)
- Grand multiparity (more than five pregnancies)
- Anaemia
- Cardiac disease
- Hypertension (Chronic as well as pregnancy induced)
- Renal disease
- Thyroid disease
- Diabetes mellitus and other endocrine disorders
- Epilepsy requiring anticonvulsant drugs
- Asthma and other respiratory disorders
- Hematological disorder
- HIV +ve
- HBV infected
- Drug use such as heroin, cocaine (including crack cocaine) and ecstasy
- Autoimmune disorders
- Psychiatric disorders
- Malignant disease

2. ANAEMIA IN PREGNANCY

Haemoglobin concentration below 11.0 gm% at any time during pregnancy is known as anemia in pregnancy. Iron deficiency anemia accounts for significant portion of cases in our state. Anemia is a direct as well as indirect cause of maternal mortality and morbidity. Iron deficiency state without manifesting as anemia is very common in females.

WHO Classification of Anaemia

Degree	Hb%	Haematocrit (%)
Moderate	7-10.9	24-37%
Severe	4-6.9	13-23%
Very Severe	<4	<13%

CLASSIFICATION

Deficiency anaemia

1. Iron deficiency
2. Folic acid deficiency
3. Vitamin B12 deficiency
4. Protein deficiency

Haemorrhagic

1. Acute: following bleeding in early months or APH
2. Chronic: hookworm infestations or bleeding piles etc.

Hereditary

1. Thalassemia
2. Sickle cell haemoglobinopathies
3. Other haemoglobinopathies
4. Hereditary hemolytic anaemia

Bone marrow insufficiency

1. Radiation
2. Drugs

Anemia of infection (malaria, TB)

Chronic diseases (renal or malignancy)

Iron deficiency anaemia is responsible for 80% of anaemias among all.

CLINICAL FEATURES

Symptoms:

1. Weakness
2. Lassitude and fatigue
3. Anorexia and indigestion
4. Palpitation
5. Dyspnoea
6. Giddiness and swelling of legs

Signs:

1. Pallor
2. Glossitis and stomatitis
3. Edema of legs
4. A soft systolic murmur in the mitral area
5. Crepitation at the base of lungs in heart failure

INVESTIGATIONS

The patient having Hb level of 9gm% or less should be subjected to a full haematological investigation to determine

- Degree of anaemia
- Type of anaemia
- Cause of anaemia

To find out the degree of anaemia

1. Hb estimation
2. Haematocrit

To ascertain the type of anaemia

1. Peripheral blood smear- microcytosis, anisocytosis, poikilocytosis, macrocytosis, target cells, hypersegmented neutrophil, reticulocyte etc
2. Sickling test
3. Haematological indices- MCV, MCH, MCHC
4. Other blood values- serum iron, serum ferritin

To find out the cause of anaemia

1. Examination of stool
2. Urine examination – routine, microscopic, culture and sensitivity
3. X ray chest with abdominal guard
4. Fractional test meal
5. Serum protein
6. Osmotic fragility test
7. Bone marrow study when indicated

COMPLICATIONS

During pregnancy

- Pre-eclampsia
- Infection
- Heart failure
- Preterm labour

During labour

- Uterine inertia
- Postpartum haemorrhage
- Cardiac failure
- Shock

During puerperium

- Puerperal sepsis
- Subinvolution
- Poor lactation
- Puerperal venous thrombosis
- Pulmonary embolism

RISK PERIODS:

When the patient may even die suddenly are

- At about 30-32 wks of pregnancy
- During labour
- Immediately following delivery
- At any time in puerperium. Specially 7-10 days following delivery.

EFFECTS ON BABY

- Diminished iron store
- Low birth weight
- Prematurity
- Intrauterine death

TREATMENT

Prophylactic

- Oral Iron – Elemental iron 100mg with folic Acid 0.5mg/day for at least 180 days during pregnancy after first trimester.
- De-worming with antihelminthics, Albendazole (400mg) single dose may be repeated after one week.

Therapeutic

1. Hospitalization: patients with Hb level <7gm% or moderately anaemic patients with associated obstetrical or medical complications should be hospitalized.
2. Oral iron: 200mg- 300mg of elemental iron along with FA is given in divided doses with or after meals and protein is supplemented. If there is no gastric intolerance it can be prescribed before meals. The dose should be stepped up gradually in 3-4 days. The treatment should be continued till the blood picture becomes normal, then 100mg of elemental iron with FA is to be continued for at least 100 days to replenish the iron store.

Response of therapy is evidenced by

- Sense of well-being
- Increased appetite
- Rise in Hb. After a lapse of 2wks Hb conc. is expected to rise at the rate of 1gm / 100ml per week.
- Reticulocytosis- within 7-10 days

If no significant improvement is evident clinically and haematologically after 3wks diagnostic re-evaluation is needed.

Parenteral therapy

Indications:

- Intolerance to oral iron
- Patient not co-operative to take oral iron
- Poor responders to oral iron
- Presence of concurrent diseases like CRF
- Iron sucrose is ideal and safe.

Calculated dose is $(2.4 \times W \times D + 500\text{mg})$, for storage iron
where W= weight in kg,

D = (target Hb in gm% - actual Hb in gm %)

Total iron is given in divided doses. 200mg iron sucrose in at least 250ml NS is given over a period of 2hrs on alternate days. Oral iron is to be stopped before 24hrs. Patient is to be supplemented with protein and multivitamins after parenteral therapy and oral iron should not be given.

Blood transfusion

Indications

- Continued bleeding
- Severe anaemia seen after 36wks of pregnancy
- Hb < 4gm any time during pregnancy

- Refractory anaemias
- Packed blood cells in heart failure
- Patients needing operative delivery

Precautions:

- Antihistaminic given IM
- Diuretic (furosemide 20mg) is given IV 2hrs prior to BT.
- Drip rate should be about 10drops/ min.

MANAGEMENT DURING LABOUR

1ST STAGE:

- The patient should be in bed
- Oxygen inhalation
- Strict asepsis

2ND STAGE:

- Prophylactic low forceps or vacuum delivery.
- IV methergine (0.2mg) following delivery of anterior shoulder.

3RD STAGE:

- Active management of 3rd stage of labour
- Blood transfusion if required
- Precaution against post partum overloading of heart

PUERPERIUM:

- Prophylactic antibiotics
- Pre delivery anaemia therapy continued till 3months after normalization of Hb level.

PATIENT EDUCATION

- Correct cooking habits
- Iron rich diet (green leafy vegetables, drumsticks, jaggery) to be taken
- Use safety latrine
- Precaution against malaria
- Regular ANC
- Plan for institutional delivery

REFERRAL CRITERIA

- Severe anaemia
- Heart failure
- Other varieties of anaemia (other than IDA)
- Associated obstetric complications

3. HYPERTENSIVE DISORDERS OF PREGNANCY

Hypertension is defined as systolic blood pressure of at least 140 mm of Hg and diastolic blood pressure of at least 90 mm of Hg (disappearance of Korotkoff sound).

Types:-

1. Gestational hypertension
2. Preeclampsia
3. Eclampsia
4. Pre-eclampsia superimposed on chronic hypertension
5. Chronic hypertension.

GESTATIONAL HYPERTENSION AND PRE ECLAMPSIA

Ideally all cases should be admitted for few days for investigative work up to classify them into one of the above categories and to manage accordingly.

Diagnostic Criteria

Gestational hypertension: i) Hypertension 140/90 mm Hg on at least two occasions.
ii) Proteinuria absent

Pre eclampsia: i) Hypertension 140/90 mm Hg on at least two occasions
ii) Proteinuria 300mg/lit in 24-hour urine sample or random 1+ dipstick

Laboratory tests: i) Blood tests: Hb%, Grouping, Rh typing, TPC, Serum urea, Creatinine, Uric acid
ii) LFT: S. bilirubin, SGOT, SGPT, LDH
iii) Coagulation profile: PT, aPTT, Plasma fibrinogen (in selected cases)
iv) Urine: Routine and microscopic
v) Obstetric USG

Pre-eclampsia may be mild or severe

Criteria for severe pre-eclampsia

1. Systolic BP 160 or Diastolic BP 110 mm Hg
2. Protein of 5 gm or higher in 24 hr urine or 3+ or greater
3. Oliguria – Urine volume, < 400 ml/ 24 hr
4. Features of imminent eclampsia- Epigastric pain, headache, blurring of vision
5. HELLP Syndrome.
6. Platelet count < 1 lakh / cmm.
7. Pulmonary oedema.
8. IUGR.

Management of gestational hypertension and mild pre-eclampsia
Usually these patients don't have any symptoms

Gestation less than 37 weeks: Out patient management

- i) Twice weekly ANC, monitor blood pressure
- ii) Daily weight check up
- iii) Foetal surveillance- DFMC, USG (twice weekly)
- iv) Patient education
- v) Don't give antihyperetensives

Patient Education:

- i) Encourage additional period of rest.
- ii) No salt restriction but no extra salt.
- iii) Patient undergoing ambulatory treatment should be warned of symptoms of worsening disease evidenced by
 - a) Gross swelling of the body
 - b) Oliguria, Anuria
 - c) Headache, visual disturbance, epigastric pain
- iv) They should be hospitalized if these symptoms appear.
- v) They should also be warned that without any symptom severe pre-eclampsia can supervene.
Hence, it is important to have regular ANC.

Once 37 week is attained or any indication for termination appears, termination of pregnancy is done depending upon

- i) Bishop score
- ii) Pelvic assessment
- iii) Foetal status

In unfavorable cervix cervical priming is done with prostaglandin (PGE2 gel) or intra cervical extra-amniotic Foley's catheter with a balloon of 30ml Normal Saline. In favourable cervix labour induction is done by oxytocin and ARM.

Gestational age more than 37 weeks:

If there is no foetal compromise assess the cervix, pelvis and foetal presentation. If all are favorable, induction is to be done. If cervix is unfavorable but other factors are favorable then ripen the cervix and then induce.

Caesarean section is to be done for obstetric indications only.

SEVERE PRE-ECLAMPSIA:

Complications of severe pre-eclampsia

- i) HELLP syndrome
- ii) Eclampsia
- iii) Cerebrovascular haemorrhage
- iv) Pulmonary oedema
- v) Renal failure
- vi) Abruptio placentae
- vii) IUGR and IUD

MANGEMENT OF SEVERE PRE-ECLAMPSIA

Aim:

- i) Prevention of eclampsia and other complications
 - ii) Antihypertensive to control severe hypertension
 - iii) Delivery of foetus with minimal trauma to both mother and foetus.
- i) Prevention of eclampsia:

Prophylactic Magnesium sulphate

Pritchard regimen:

Loading dose: Magnesium sulphate, 4 gm slow IV over 5 minutes

Magnesium sulphate, 5 gm deep IM on each buttock

Maintenance dose: Magnesium sulphate, 5 gm IM on alternate buttock 4 hourly

Before repeat administration ensure - patellar reflex is present

- respiration rate is 12/min
- urine output 30 ml per hour in last 4 hours

Continue treatment for 24 hours after delivery or last convulsion whichever is later. Withhold the dose if the above criteria are not satisfied.

In case of magnesium toxicity its antidote calcium gluconate, 10 ml of 10% solution is given slow IV.

ii) Antihypertensives:

Antihypertensives are for maternal benefit. They are indicated in severe hypertension (systolic 160 mm Hg, diastolic 110 mm Hg). Aim is to keep diastolic blood pressure between 90 to 100 mm of Hg.

Antihypertensives in common use are

- i) Labetalol, 100 mg twice daily and can be increased to 1200 mg per day
- ii) Nifedepine, 10 mg 6 hourly maximum upto 120mg per day.

In resistant cases parenteral labetalol or nifedipine (orally) in more frequent doses can be administered.

iii) Termination of pregnancy:

Severe pre-eclampsia mandates delivery within 24 hours. If there is no contraindication and cervix is ripe, then induction of labor to be done with oxytocin I.V. drip. In case of unripe cervix remote from term or with other complications caesarian section is a better option. However in unripe cervix with other favorable conditions cervical priming should be done. Undue prolongation with unsuccessful attempt at priming and induction of labour only increases the complication rate.

Caesarian section is done for all obstetric indications.

iv) Postpartum care

- Anti convulsant to be continued for 24 hours after delivery or last convolution whichever is later.
- Antihypertensives if blood pressure goes above 110 mm Hg diastolic
- Monitor urine output

Referral criteria:

- i) All cases of severe pre-eclampsia are to be transferred to higher center if Caesarean section and blood transfusion facilities are not there. But before transfer loading dose of Magnesium sulphate and antihypertensive if needed are to be given.
- ii) HELLP syndrome
- iii) Acute renal failure or oliguria which persists for more than 48 hours after delivery.
- iv) In preterm or IUGR foetus when neonatal facilities are not adequate

Patients at risk for developing pre-eclampsia

- i) History of eclampsia or pre-eclampsia in previous pregnancy
- ii) Chronic hypertension
- iii) Chronic renal disease
- iv) Diabetes mellitus
- v) Hypothyroidism
- vi) Sickle cell disease
- vii) SLE

CHRONIC HYPERTENSION

Hypertension before 20 weeks of gestation or beyond 12 weeks postpartum is called chronic hypertension.

The cause of hypertension is to be established:

- 90% are due to essential hypertension
- Rest are secondary hypertension

MANAGEMENT

- i) Adequate rest
- ii) Frequent ANC
- iii) Antihypertensives
 - Aim is to keep diastolic blood pressure below 90 mm Hg., when there is end organ dysfunction like previous cerebrovascular event, myocardial infarction or present cardiac or renal dysfunction. Without these risk factors diastolic blood pressure should be kept below 100 mm Hg. Strict control of hypertension decreases maternal complications but uteroplacental perfusion suffers. Safe antihypertensives during pregnancy are alpha-methyl dopa, Nifedipine and labetalol. ARB group of antihypertensives should not be prescribed during pregnancy.
- iv) Strict vigilance is to be maintained for complications, most common being superimposed pre-eclampsia and placental abruption.
- v) Monitoring of foetal growth is to be done
- vi) If proteinuria or other symptom or signs of pre-eclampsia appears then she has to be managed accordingly.
- vi) Plan for delivery:
 - a) If no complication deliver at term
 - b) In case of multifoetal gestation delivery is to be planned before term.

ECLAMPSIA

New onset grand mal seizure or coma on a patient with pre-eclampsia without any neurological cause is termed eclampsia.

Diagnostic criteria:

- i) Hypertension
- ii) Proteinuria
- iii) Convulsion or coma

Hypertension and proteinuria may be absent in 15% of cases where biochemical parameters like elevated liver enzymes may help in diagnosis. Eclampsia is usually preceded by symptoms of imminent eclampsia like headache, visual disturbance, hyperreflexia and epigastric pain.

Investigations

- i) Blood tests: Hb%, Grouping, Rh typing, TPC, Serum urea, Creatinine, Uric acid, Random blood sugar
- ii) LFT: S. bilirubin, SGOT, SGPT, LDH
- iii) Coagulation profile: PT, aPTT, Plasma fibrinogen (in selected cases)

- iv) Urine: Routine and microscopic
- v) Obstetric USG
- vi) CT scan of brain in selected cases

Management during seizure

- i) Prevent injury
- ii) Don't restrain from convulsion
- iii) Maintain airway, place padded tongue blade
- iv) Place patient in left lateral position to prevent aspiration
- v) Oxygen saturation should be monitored with pulse oximeter (if practicable)
- vi) Oxygen inhalation to correct hypoxia and acidosis
- vii) Give anticonvulsant drug
- viii) After convulsion aspirate mouth and throat

Controlling seizure and preventing recurrence

- i) Magnesium sulphate (Pritchard regimen) described in severe pre-eclampsia.
- ii) Inj. Phenytoin or Inj. Phosphenytoin, 100 mg 8 hourly when there is magnesium toxicity or it is contraindicated.
- iii) Inj. Lorazepam or Inj. Diazepam

Treatment of hypertension

Indication for antihypertensive: BP 160/90

Drugs used in hypertensive emergencies:

Labetalol: 20 mg IV bolus repeated after 10 minutes with the same dose. In case of unsatisfactory response to be repeated every 10 minutes with double the previous dose maximum upto total dose of 220 mg. Before each dose blood pressure must be recorded till diastolic BP is < 100 mm Hg. Then followed up with oral labetalol.

Nifedipine: 10 mg orally, to be repeated after 30 minutes if necessary. Once desired BP is achieved this dosage is continued regular BP monitoring. Nifedipine is never to be used sub-lingually.

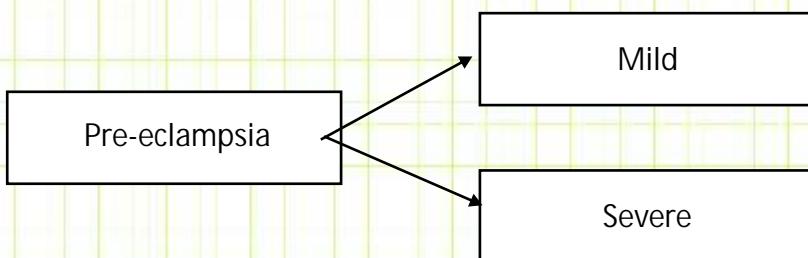
Fluid & Electrolyte balance

1. Required fluid: 1 to 1.5 ml/Kg/hr or 80 ml/ hr of balanced salt solution. Ringer's lactate is the best.
2. Oliguria without risk factors like HELLP syndrome, sepsis and haemorrhage is dealt with expectant management, fluid challenge not to be done.

- Oliguria and anuria with the above risk factors need
 - Invasive monitoring,
 - Continuous frusemide or renal dose dopamine 3 mcg/kg/min to promote diuresis

Labour and delivery

Delivery is the definitive treatment of eclampsia. Vaginal delivery is preferred when there is good prospect of vaginal delivery within 24 hours. Anticipation of vaginal delivery should not degenerate into prolonged labour. In case of unfavorable cervix not responding to priming or worsening maternal or foetal condition caesarean section is to be done without any hesitation.



Mild:

SBP < 160 mm Hg & DBP < 110 mm Hg

Proteinuria 0.3gm to 5gm / day

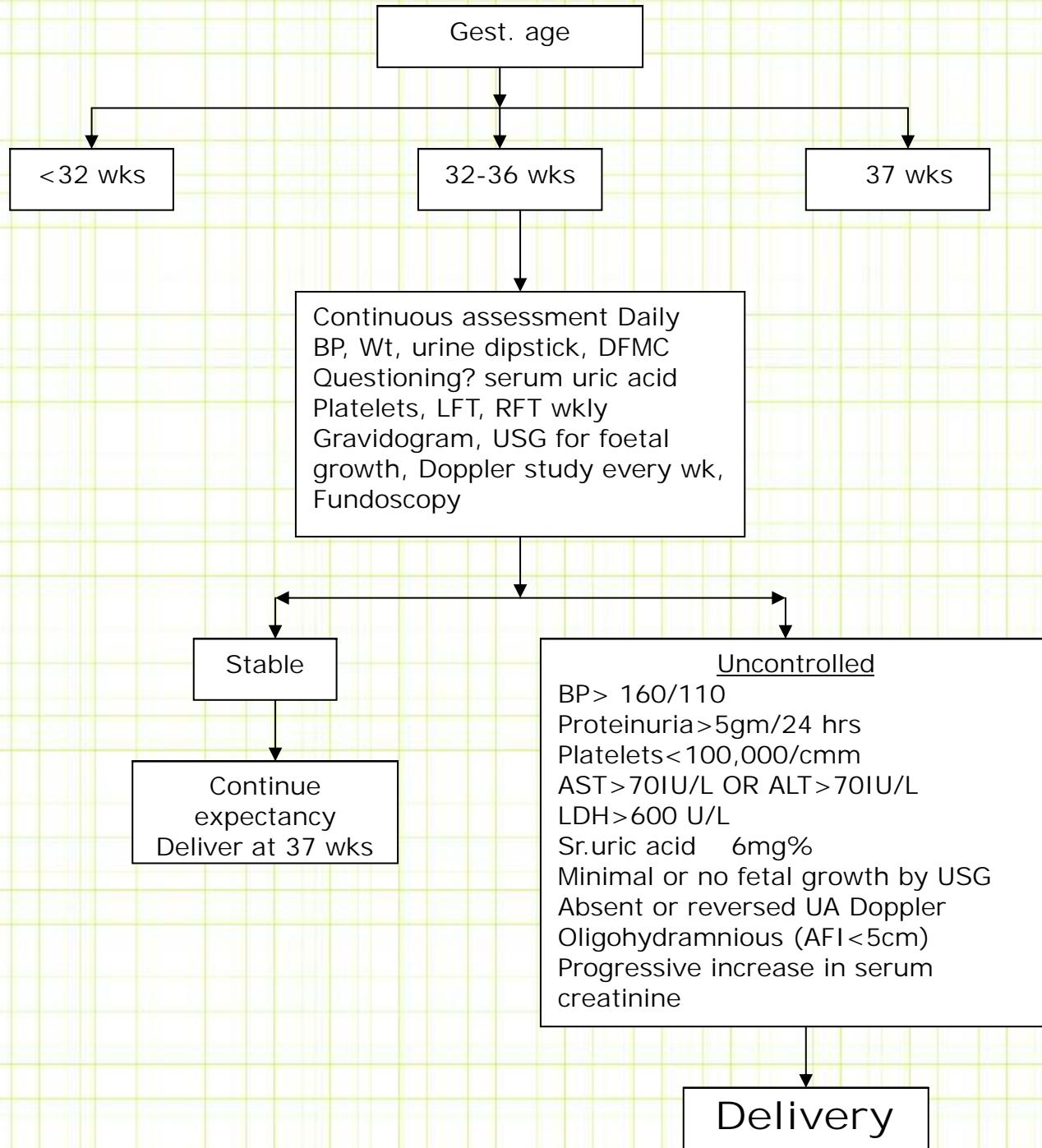
The patient does not have any signs & symptoms associated with severe PET.

Severe Pre-eclampsia:

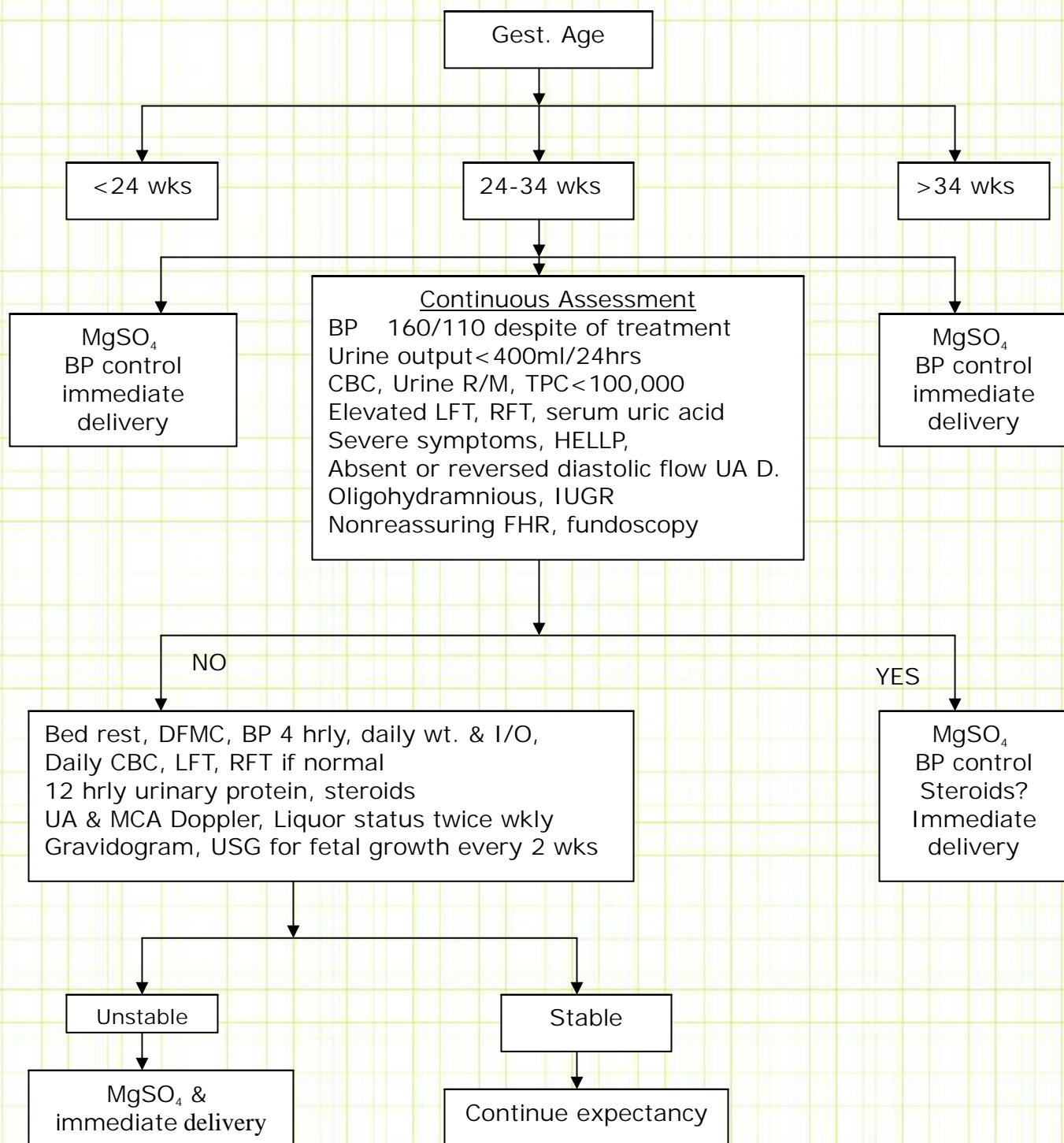
Criteria for diagnosis of severe pre-eclampsia

- Systolic blood pressure of 160 mmHg or higher or diastolic 110 mmHg or higher on two occasions at least 6 hours apart while the patient is in bed rest.
- Proteinuria of 5g or higher in a 24-hour urine specimen or 3+ or greater on two random urine samples collected at least 4 hours apart.
- Oliguria of less than 400 ml in 24 hours.
- Pulmonary edema or cyanosis
- Severe headache, vomiting
- Epigastric or right upper quadrant pain
- Cerebral or visual disturbances
- Signs of clonus, papilloedema
- Impaired liver function
- Thrombocytopenia
- IUGR
- A DBP 100 on 2 occasions & significant proteinuria with at least 2 signs or symptoms.

Mild Preeclampsia



Severe Preeclampsia



Eclampsia

ABC

Place the patient in Lt. Lat. Position
Insert padded tongue blade, avoiding gag reflex.
Suction oral secretions.
Give O₂ mask at 8 – 10 L/min.
Elevate bed side rails and pad them to avoid injury.
Use physical restraints if necessary.
IVF (80ml/hr or 1ml/kg/hr)

Loading dose of MgSO₄ & then maintenance
(if referred with MgSO₄, then only maintenance)

Antihypertensive, if DBP > 110mm Hg after MgSO₄

Indications for CS

- ❖ Unripe cervix.
- ❖ GA < 32 weeks
- ❖ Inadequate BP Control
- ❖ Obstetric indication for CS
- ❖ Fetal distress, status eclampticus

Intermittent I.M. Injections (Pritchard Regimen)

- 4g of 20% Magnesium sulphate I.V @ not exceeding 1g/min.
- Followed by 10g of 50% Magnesium sulphate 5g each in both the buttocks through a 3-inch long, 20G needle (1ml of 2% lidocaine minimizes discomfort).
- If convulsion persists after 15 min. give upto 2g more in I.V 20% Magnesium sulphate @ not exceeding 1g/min. if the women is large upto 4g may be given.
- Thereafter give 5gm of 50% solution of Magnesium sulphate every 4hr in alternate buttock. Magnesium sulphate is to be continued 24 hrs after delivery or if eclampsia develops post-partum, 24 hrs after the last seizure.

Monitoring of Magnesium Toxicity.

- Urine output should be at least 30ml/hr or 100ml in last 4hr.
- Deep tendon reflexes should be present (disappearance of the patellar reflex is the first sign of impending toxicity, in this case the drug must be discontinued until the patellar reflex is present.)
- Respiration rate** should be greater than 14 breaths / min (if there is respiratory

depression due to hyper-magnesemia O₂, I.V. Calcium gluconate (1g) 10ml of a 10% solution to be given over 10 minutes withholding the magnesium sulphate.

Pulse oximetry = 96%

Treatment of Hypertension

Nifedipine

Should be given orally not sublingually

5 – 10mg Cap. Start

↓
BP monitored every 15 minutes

↓
Repeat 10 mg every 30 to 60 minutes till adequate response.

Methyl Dopa (1st line antihypertensive)

Orally 250 mg bid may be increased to 1 g q.i.d.

Labetalol

If > 160/110

↓
IV bolus of 20 mg

↓
If not decrease to diastolic 80 – 110mm Hg in 10 mins

2nd dose of IV bolus of 40mg

if not controlled 3rd IV bolus of 80mg

↓
when controlled oral labetalol 200 – 400mg of 12 Hrly

if we give by continuous IV then 20mg/hr, max. upto 200mg/hr

↓
once BP stabilized 100 – 400mg orally every 6 – 12 Hrs.

Diuretics

Diuretics contraindicated in preeclampsia and eclampsia before delivery except those with ...

Pulmonary edema, severe edema or renal failure.

Furosemide 20 – 40mg IV/6-12 hrly should be initiated shortly after delivery (VD / CS) then orally when patient able to.

Principles of Peri – Partum Care

Maintain vigilance as 44% eclampsia occurs postpartum

High dependency care should be provided as clinically indicated (minimum 24 hrs) consider ICU care.

Maintain close attention to fluid balance.

Reduce antihypertensive medication as indicated.

Inpatient care for 4 days or more.

Follow-up.

4. NORMAL LABOUR

Diagnosis

The objective of diagnosis is to confirm diagnosis of labour, to find out if there is any high risk factors associated, which needs close and highly specialized management or referral. To answer the above questions it is required by the attending doctor to have a thorough history taking and detailed clinical examination similar to described in Ante-natal Care.

History and Physical Examination of a woman in labour

Woman is to be asked about

- Time since beginning of abdominal pain or discomfort
- Any other complains like bleeding or leaking

Physical Examination

General & Systemic Examination: Particular importance is attached to

- Height.
- Weight.
- Gait.
- Pallor.
- Oedema.
- Icterus.
- Lymphadenopathy.
- Pulse.
- Blood Pressure.
- Thyroid examination.
- Breast examination.
- Respiratory System
- Cardiovascular System and
- Other systems

Abdominal Examination

- Height of the fundus of the uterus
- Frequency of contraction (no./ 10 min.)
- Duration of each contraction (in seconds)
- Lie, Presentation and Position of the fetus
- Foetal Heart is to be auscultated
- Clinical assessment of amniotic fluid volume

Pelvic Examination:

- Cervical condition
- Effacement
- Dilatation
- Consistency
- Direction of os
- Condition of the bag of waters
- Presenting part
- Head or any other
- Station of the PP
- Position of the PP (in case of enough cervical dilatation)

Pelvic assessment

- Type of sacrum (curvature)
- Sacral promontory
- Shape of the brim
- Side walls
- Ischial spines
- Interspinous diameter
- Sacrosciatic notch
- Sub-pubic arch and angle
- T. D. O (Transverse Diameter of the Outlet)

Investigations

- Haemoglobin, Urine - Routine tests including ketone bodies and obstetric USG.
- After completion of above task one will be able to answer the questions asked at the beginning.

Signs of Labour

- Intermittent painful uterine contractions with gradually increasing frequency and intensity.
- Show (passage of blood stained thick mucous plug)
- Progressive effacement and dilatation of the cervix (in Primigravidae first effacement then dilatation and in multipara effacement and dilatation take place simultaneously)
- Formation of bag of waters
- Occasionally, particularly, in pre-labour and early part of latent phase of labour there may be doubt about diagnosis of labour. In these circumstances it is always advisable to examine the woman after a gap of 4 – 6 hours.

Stages and phases of labour

There are three stages of labour

- First stage: From the onset of labour to full dilatation of cervix
- Second stage: From full dilatation of cervix to complete expulsion of the foetus.
- Third stage: From expulsion of the foetus to complete expulsion of the placenta cord and the membranes

There are two phases of labour from the practical point of view.

- Latent phase: From onset of labour to 4 cms. dilatation of the cervix
- Active phase: From 4 cms. to full dilatation of the cervix. Once labour is diagnosed the woman is admitted and managed.

MANAGEMENT

FIRST STAGE OF LABOUR

- The woman should be ambulatory in the first stage as long as she feels comfortable.
- Routine use of enema is no more recommended.
- Shaving not recommended routinely. Only clipping of pubic hair is required.
- Clear liquid reach in calorie and electrolytes. The liquid should be such that it can be aspirated by a Ryle's tube as and when required and it should not increase the gastric acidity.

MONITORING

- General condition of the woman every 30 minutes.
- Monitoring of uterine contractions every half an hour.
- FHR monitoring every 30 minutes and every 15 minutes in high risk cases. P/V examination to monitor cervical effacements and dilatation every 4 hours in Latent phase and more frequently in active phase.
- P/V examination must be done if the membranes rupture. Assessment of progress of labour must be done using a simplified PARTOGRAPH.
- Analgesia during labour - Inj Tramadol 1mg/Kg IM can be repeated at intervals of 6 to 8 hours.
- Antibiotics, not required routinely

SECOND STAGE OF LABOUR DIAGNOSIS

- Bearing down by the woman
- Contractions become more frequent lasting for more than 1 minute
- Rupture of membranes

MANAGEMENT

- To catheterise the bladder if full and woman is not able to void
- P/V examination at 30-60 minutes interval in Primigravida or 15-30 minutes interval in a multipara to assess progress of labour i.e. decent and rotation of head. Best guide for timing of the next examination is the findings of present examination.
- FHR monitoring – Every 5-15 minutes
- Posture - Current recommendation is assumption of whichever position, the patient likes.
- Prevention of Infection Practices must be the rule.

CONDUCTION OF DELIVERY:

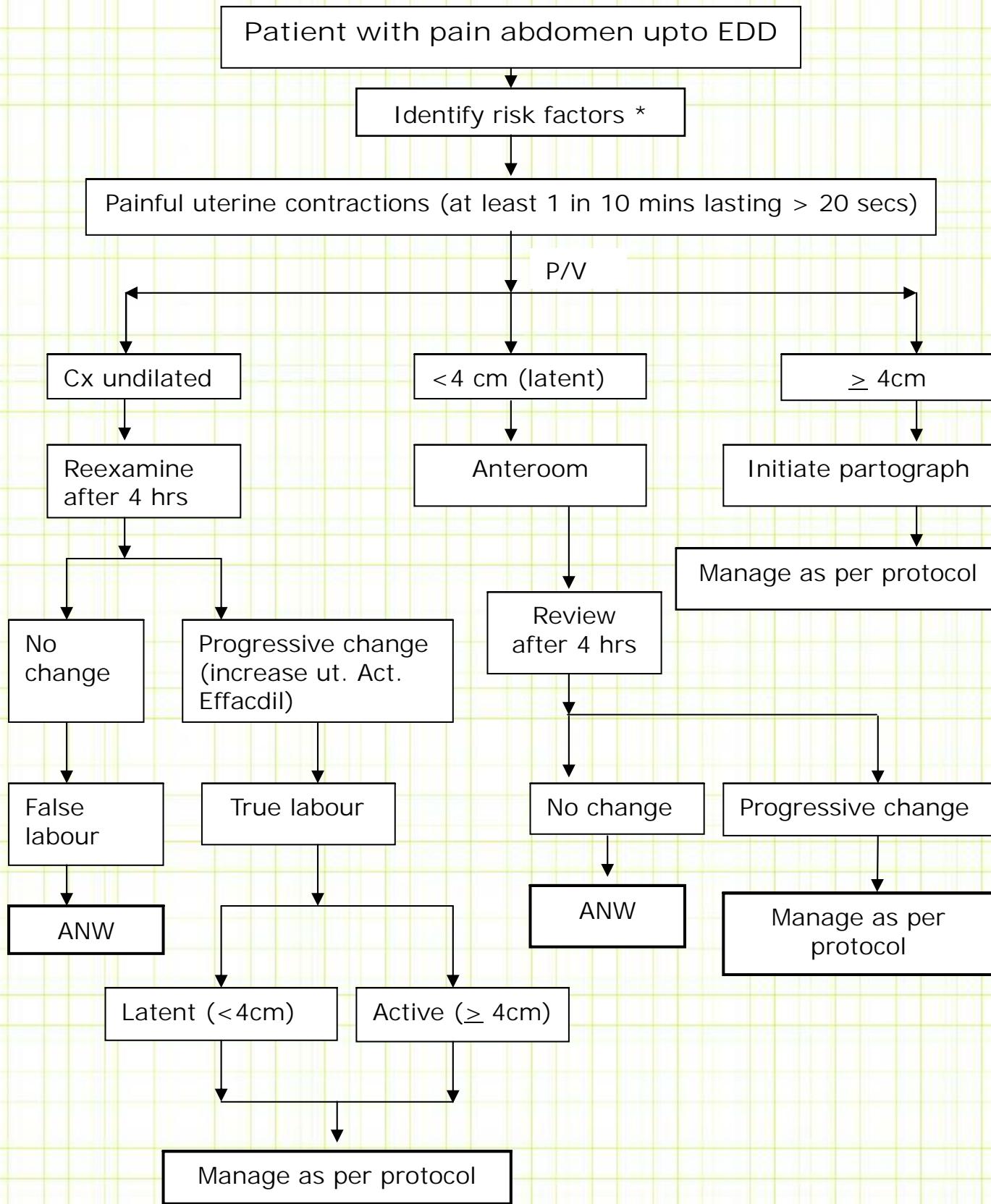
- Preparation for delivery – All required instruments and equipments to be carefully checked
- Episiotomy - Restrictive use recommended only in cases where the perineum is at the risk of rupture.(All aspects of episiotomy described later)
- Delivery of the head - Slow delivery of the head in between the contractions. Extension with resultant delivery of the head should not be allowed till the occiput is well under the pubic arch. Till this point of time flexion of the head is to be maintained by support.
- Immediate suction of mouth and pharynx as soon as the head is free.
- Neck examined for cord. Loose cord is slipped over and tight cord is divided in between two large artery forceps.
- Delivery of the shoulders done after restitution and external rotation of the head. After moving slightly to right side the head is held firmly but with care in between two hands, left above the right and head is depressed down wards to deliver the anterior shoulder. Carrying the head upwards towards the mother's abdomen will effect delivery of the posterior shoulder and the trunk. Anterior shoulder should be delivered first.
- Care of the newborn - Baby to be kept on a clean tray covered with dry linen. Baby is to be covered with a clean and dry towel. Air passages are to be cleaned of mucus and liquor by gentle suction. Apgar rating is recorded at 1 and 5 minutes. Cord is clamped with a disposable cord clamp or ligated with sterilized silk tie keeping a stump of 2 - 3 cms. long. The baby is examined for any structural anomaly. Baby is immediately kept with the mother and should not be separated from mother. Bathing of the baby with either soap and water or cleaning with oil is to be strictly condemned.

MANAGEMENT OF THIRD STAGE OF LABOUR

AMTSL (Active Management of Third Stage of Labour) must be practiced in each and every case as follows

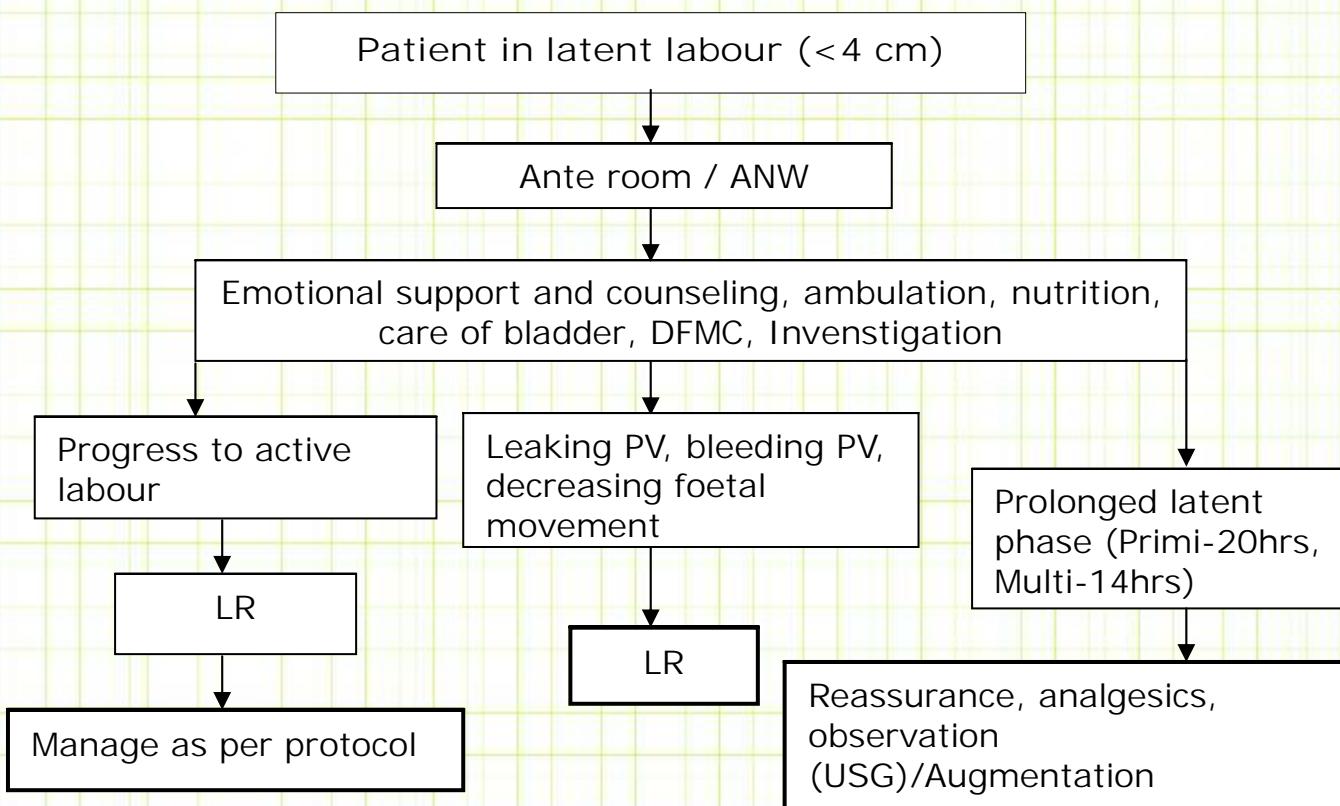
- Oxytocin 10 units IM within 1 min
- Late Cord clamping – cord is clamped after cessation of cord pulsation.
- Controlled cord traction applied. Completeness of maternal surface of placenta is checked.
- After delivery of placenta - fundal massage every 15 mins by the patient herself for 2hrs. Oxytocin drip is continued for 1 hr
- Vital signs are checked, immediately and then every 15 mins. for the first 2 hrs, then every 30 mins for 1 hr and every 1 hr for 3 hrs.
- Condition of the uterus is examined to look for contraction and retraction of the uterus.
- Inspection of vulva is done for any bleeding.
- Repair of perineal tear /episiotomy as described later
- Ensure breast-feeding immediately.

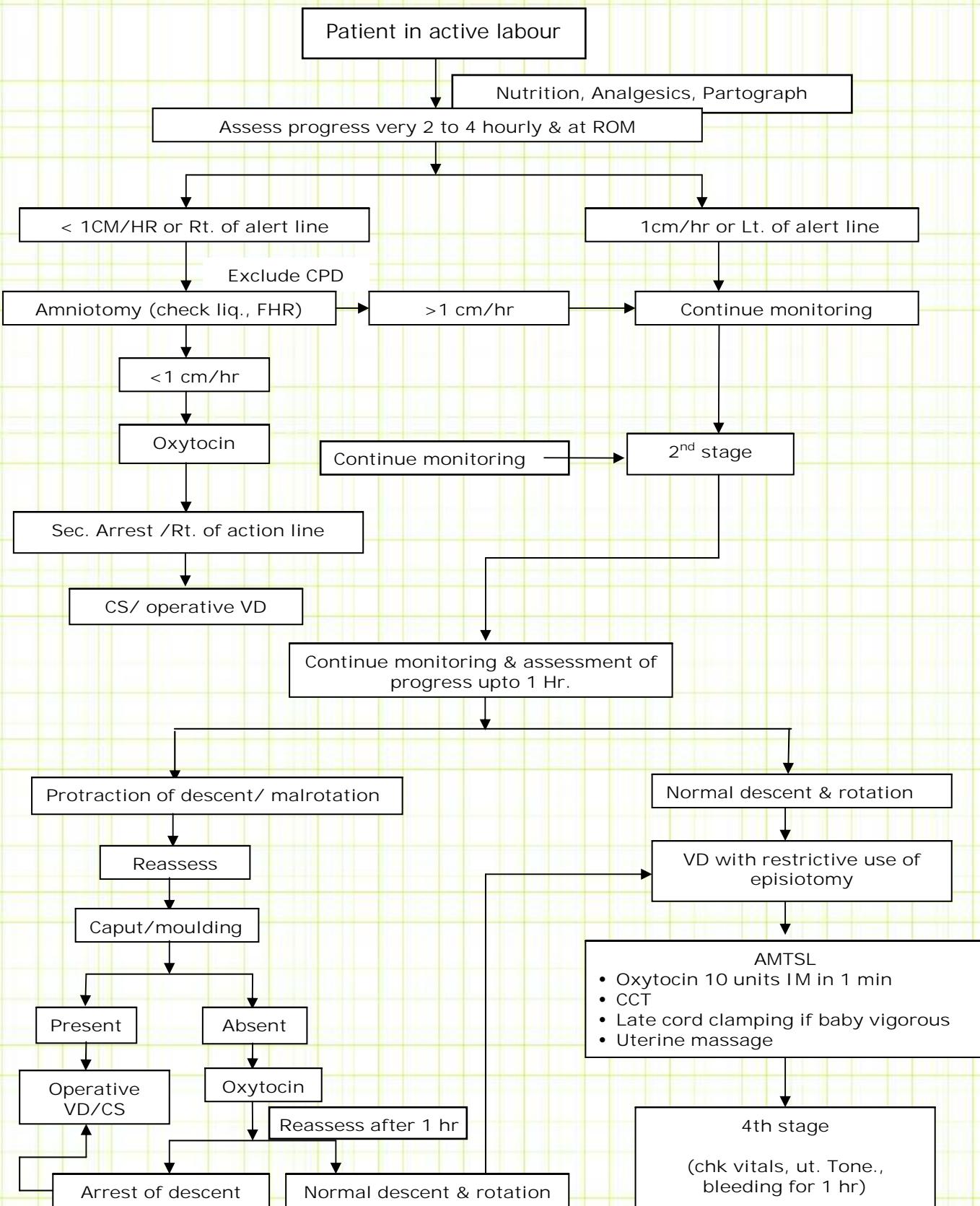
PROTOCOL FOR MANAGEMENT OF LABOUR



* Checklist of risk factors

- ❖ Preterm
- ❖ Post term
- ❖ Significant medical diseases – HTN, DM, heart disease, anaemia
- ❖ Post CS pregnancy.
- ❖ IUGR
- ❖ Malpresentation.
- ❖ APH.
- ❖ PIH, Pre eclampsia, eclampsia
- ❖ Multiple pregnancy
- ❖ Grand multigravida.
- ❖ Elderly primigravida
- ❖ Pregnancy after infertility treatment.
- ❖ BOH
- ❖ PROM
- ❖ ISO immunisation
- ❖ Decreased foetal movement
- ❖ Compromised BPP
- ❖ Pregnancy after gynecological surgery like myomectomy, VVF repair





REFERRAL CRITERIA

- History of any adverse event during previous pregnancy and or child birth
- Any complication associated with present pregnancy.
- Prolonged Labour (Stage I>12 hrs., Stage II > 2 hrs.)
- Cervical graph on the partograph remaining to the right of 'Alert Line' in spite of good uterine contractions.
- Foetal Distress in Stage I.
- Abnormal Presentation.
- Features of obstructed labour.
- Post-partum Haemorrhage, (when primary interventions fail to control)
- Morbidly adherent Placenta.
- Inversion of Uterus.
- Suspected Rupture of Uterus.

[During the Referral Process On-going Measures like I.V. Fluids, Indwelling Catheter, Uterine Massage. Escalating Doses of Oxytocin (till 100 units is reached, in cases of Atonic P.P.H and Retained Placenta). Vaginal Pack in traumatic P.P.H, must be instituted simultaneously.]

5. EPISIOTOMY

A surgically planned incision on the perineum and the posterior vaginal wall during the second stage of labour is called episiotomy .

OBJECTIVES:

- To enlarge the vaginal introitus so as to facilitate easy and safe delivery of the foetus spontaneous or manipulative.
- To minimize overstretching and rupture of perineal muscles and fascia and to reduce pressure on the foetal head.

INDICATIONS:

It is recommended in selective cases, and should not be performed routinely.

1. In rigid perineum causing arrest or delay in descend of the presenting part.
2. Complicated vaginal delivery (big baby, premature baby, breech, face anterior, face to pubis and shoulder dystocia)
3. Operative delivery forceps and ventouse.
4. Previous perineal surgery (pelvic floor repair and pelvic reconstructive surgery).

TYPES OF EPISIOTOMY:

There are three types episiotomy depending on location of the incision.

- i. Mediolateral
- ii. Median
- iii. Lateral

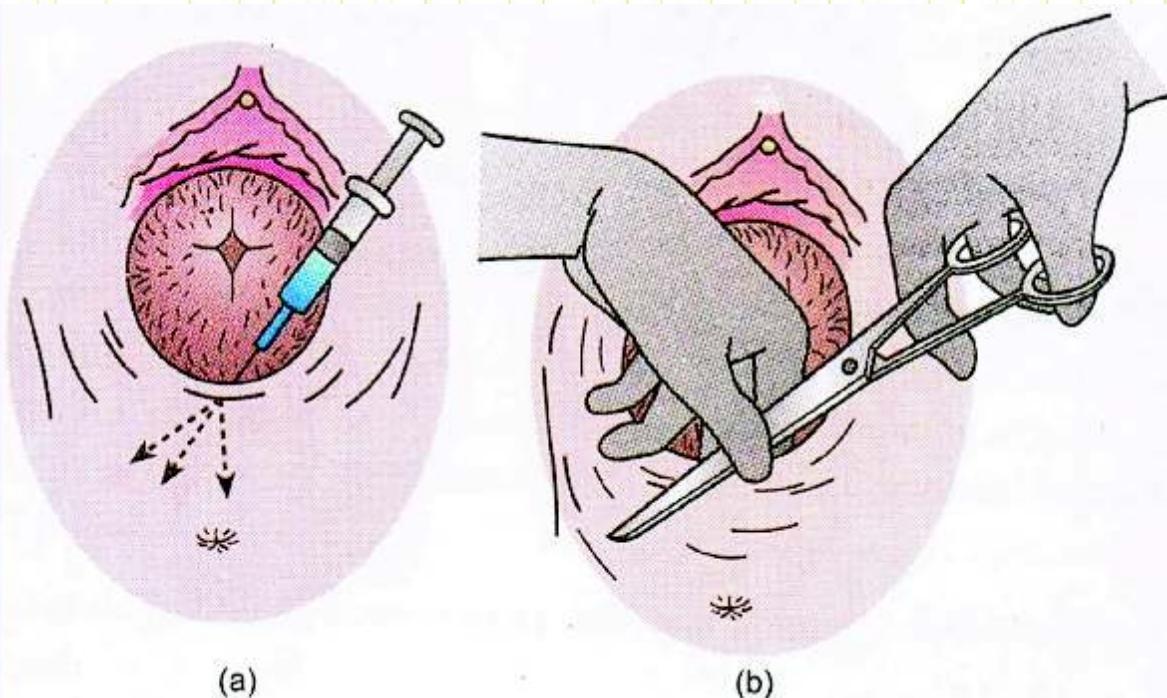
Of all the above medio-lateral episiotomy is most commonly practiced.

STEPS OF MEDOLATERAL EPISIOTOMY

1. The patient is put in lithotomy position
2. The perineum is thoroughly cleaned with antiseptic lotion.
3. It is made sure that there are no known allergies to lignocaine or related drugs.
4. 10 ml of 1% lignocaine solution is taken and infiltration is done beneath the vaginal mucosa, the skin of the perineum and deep into perineal muscles, taking care not to inject intravascularly by aspirating before pushing.
5. Local anaesthesia is given 2- 5 minutes before incision to provide sufficient time for effect.
6. Episiotomy is performed only after the perineum becomes thin but before it is over stretched and 3-4 cm. of the baby's head is visible during a contraction just before crowning. Performing an episiotomy will cause bleeding, so it should not be done too early.

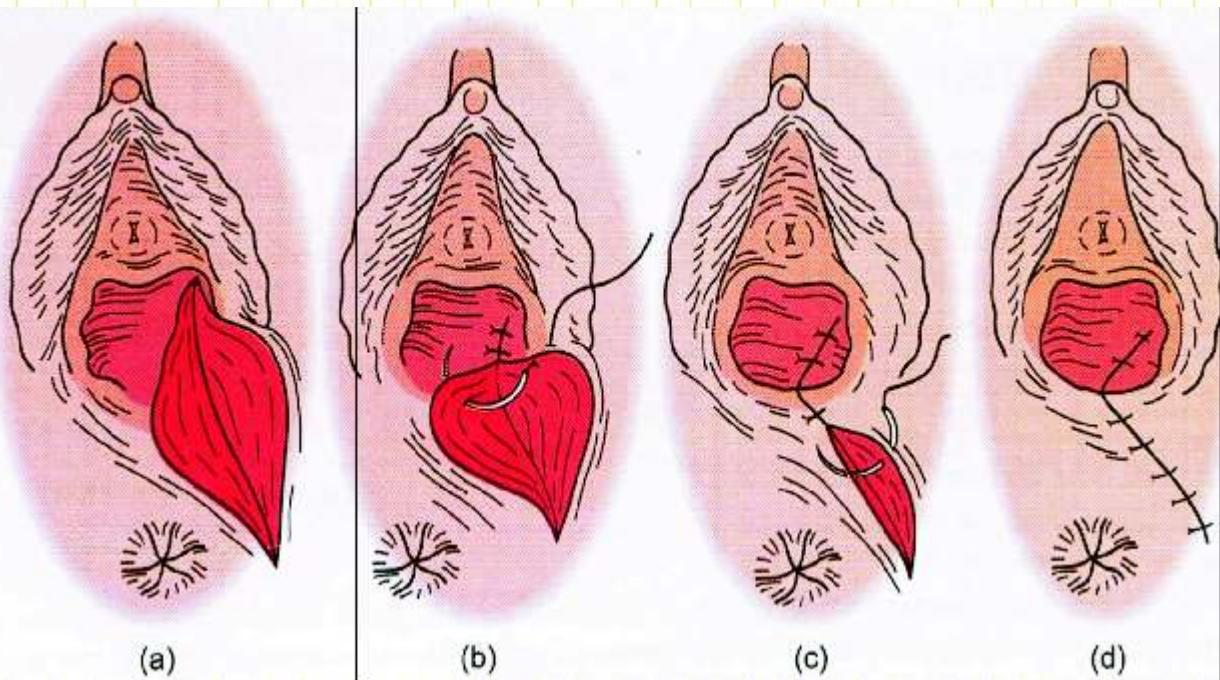
INCISION:

- Two fingers are placed in the vagina between the presenting part and the posterior vaginal wall. The incision is made by a curved or straight blunt pointed scissors, one blade of which is placed inside in between the finger and the posterior vaginal wall and the other on the skin.
- The incision should be made at the height of uterine contraction.
- Deliberate cut should be made from the centre of the fourchette extending mediolaterally either to right or left about 2.5 cm away from anus.
- It should cut about 3-4 cm of posterior vaginal wall and perineum.
- The baby's head and shoulders are controlled as they deliver, ensuring that the shoulders have rotated to the midline to prevent extension of episiotomy .



REPAIR:

- a. Repair is done soon after expulsion of placenta. Carefully the extensions and other tears are examined if any.
- b. The perineum and wound area is again swabbed with antiseptic lotion.
- c. The vaginal mucosa is closed by continuous sutures with (1-0) chromic catgut mounted on curved atraumatic needle.
- d. The repair is started about 1 cm, above the apex and continued up to the level of vaginal opening. The suture should include deep tissue to obliterate the dead space.
- e. The perineal muscles are closed by interrupted stitches with (1-0) chromic catgut mounted on curved atraumatic needle.
- f. The skin is closed by interrupted vertical mattress stitches with (1-0) chromic catgut mounted on curved atraumatic needle.



POST OPERATIVE CARE:

- The wound is to be dressed by the patient with antiseptic lotion followed by any antiseptic ointment application, each time following urination and defecation for 7- 10 days.
- Cap Ampicillin 500 mg. 6 hrly / Cap. Amoxycillin 500mg 8hrly / Tab. Cefadroxil 500mg BD orally for 5 days.
- Tab. Ibuprofen (400mg) and Paracetamol (500mg) orally after food three times a day for 5 days to relieve pain.

COMPLICATIONS:

- Hematoma formation: Opened and drained and reclosed after giving a drain.
- SEPSIS: If mild continue antibiotics. If severe Tab. metronidazole (400mg) orally three times a day and Tab. cefixime (200mg) two-time a day to be added.
- If necrotizing fasciitis involving deep tissue occurs, debridement is done, antibiotics given parenterally and secondary closure performed after 6 week.

6. PRETERM LABOUR

Definition :-

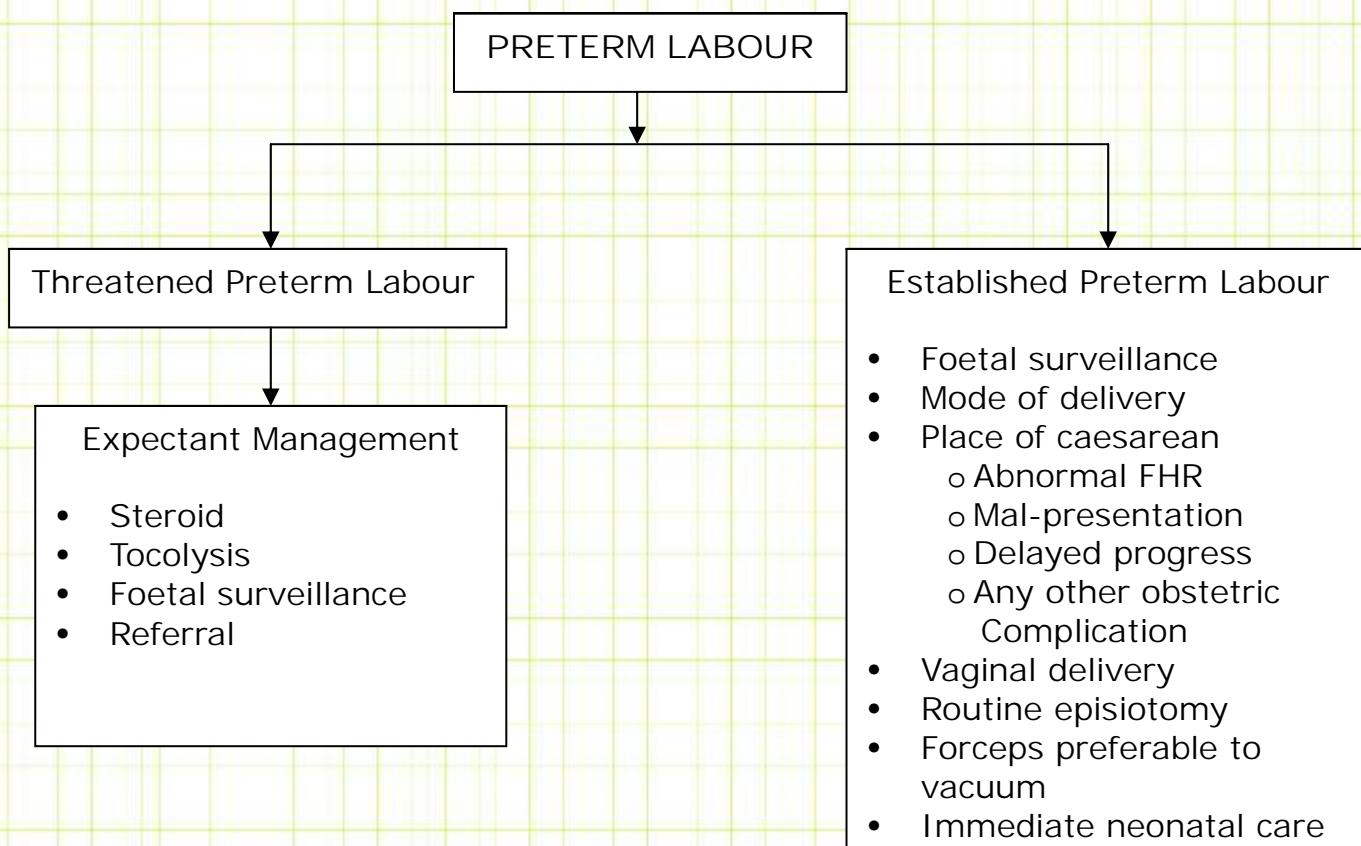
- Gestational age of < 37 completed weeks
- Regular & painful uterine contractions (- 4 in 20mins. or - 8 in 1 hr)
- Cervical changes – effacement 80% & dilatation 1 cm

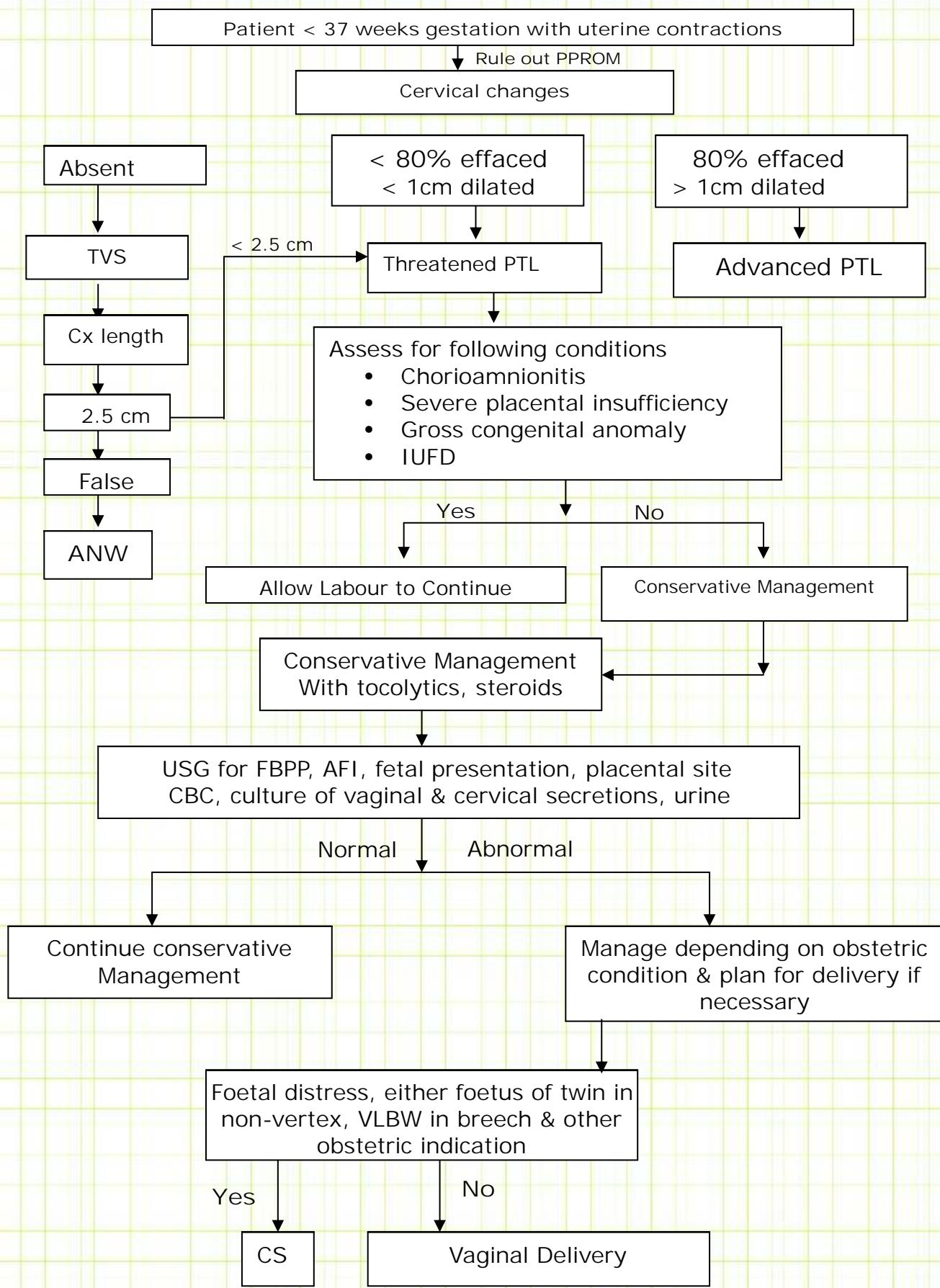
THREATENED PRETERM LABOUR –

Documented uterine contractions but no evidence of cervical change.

AIMS & OBJECTIVES OF MANAGEMENT

1. Until effective strategies are found, efforts should be aimed at prolonging pregnancy as much as possible.
2. Intra-partum management
3. Neonatal care





7. PREMATURE RUPTURE OF MEMBRANE

Pre labour rupture of membrane:

Defined as rupture of foetal membranes before the onset of labour.

- Term PROM
- Preterm PROM [prior to 37 wks]

INITIAL ASSESSMENT

- To confirm the diagnosis of PROM
- To assess the gestational age of foetus / disposition of foetus in utero / liquor status / estimated birth weight
- Exclusion of overt chorioamnionitis
- To assess the cervical status (Bishop's scoring)

Diagnostic criteria of PROM:

History: sudden gush/continued leakage of fluid

Sterile speculum examination:

- Presence / absence of pooling of amniotic fluid in posterior fornix, spontaneously / after fundal pressure / straining
- Presence of meconium
- Cervical length & dilatation

Digital examination :

- Repeated digital examination to be avoided unless active labour / imminent delivery

Specialized test: (if practicable)

- Nitrazine test
- Fern test
- Foetal fibronectin
- IGFBP1

Sonography:

 Useful in some cases to help confirm the diagnosis

Obstetric sonography with special reference to

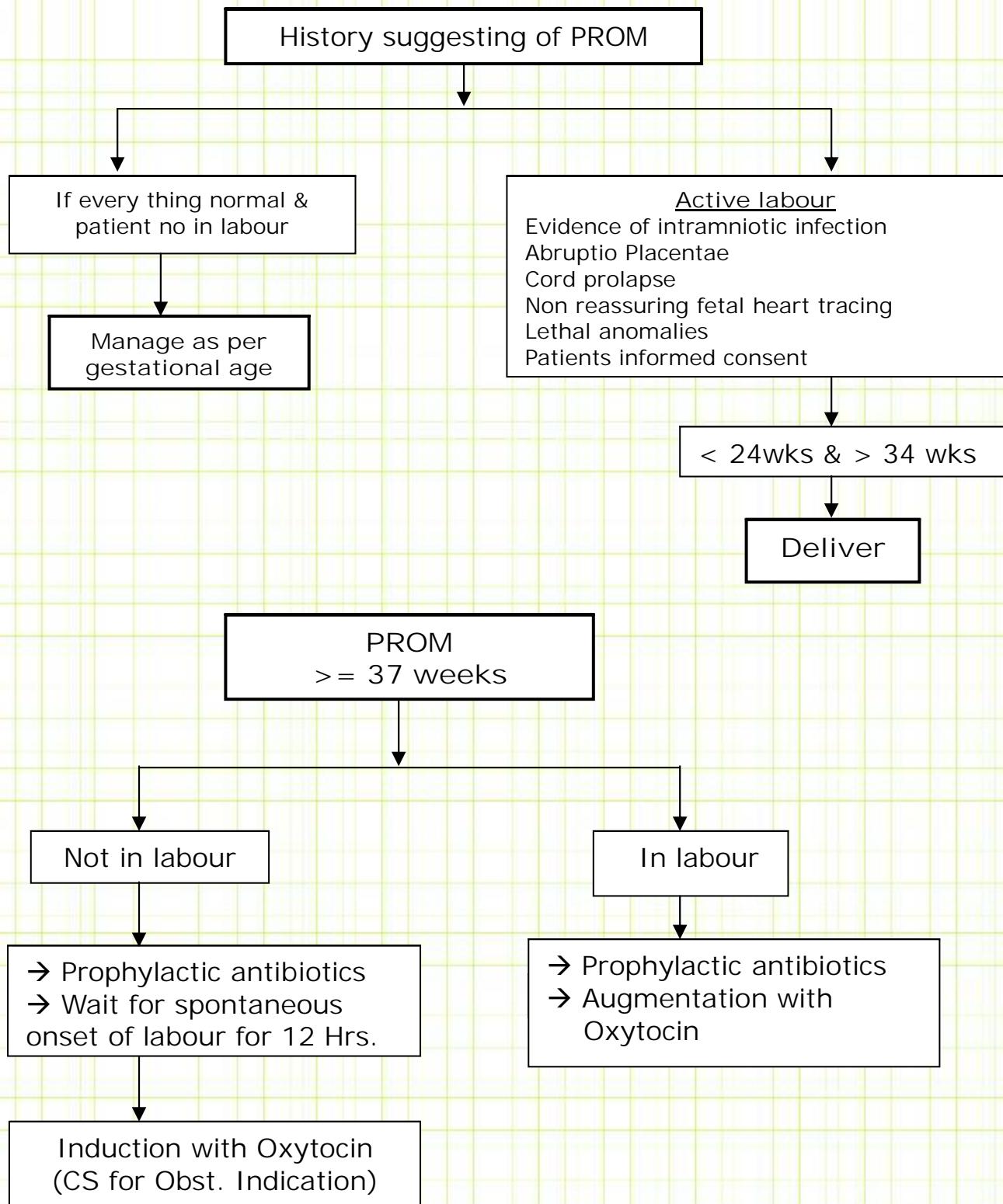
- Liquor status
- Foetal examination
 - ❖ Number
 - ❖ Presentation & position
 - ❖ Viability
 - ❖ Weight
 - ❖ Malformation
- Placental grading

Colour Doppler is indicated in certain selected cases of foetal compromise

MANAGEMENT

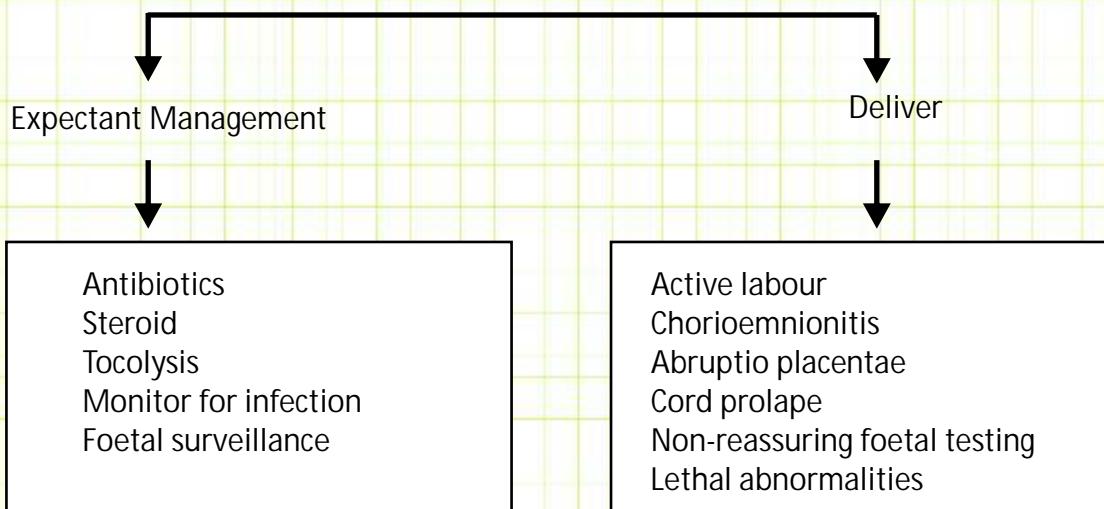
Components:

- Hospitalisation
 - ❖ Mandatory after confirmation of diagnosis
 - ❖ No place for domiciliary treatment in proved case
- Bed rest with sterile pad
- Prophylactic antibiotics
 - ❖ Prevents maternal chorioamnionitis and neonatal infection
 - ❖ Choice of antibiotics
 - IV Ampicillin 500mg 6 hrly / IV Amoxycillin 500mg 8 hrly + Tab. Erythromycin 250mg – 500mg 6 hrly orally for 48 hrs
 - Cap. Amoxycillin 500mg 8hrly + Tab. Erythromycin 250mg – 500mg 6 hrly orally for 5 days or
 - Tab. Erythromycin 250mg orally 6hrly for 10 days (only Erythromycin base to be used in pregnancy)
- Corticosteroids
 - ❖ Betamethasone 12 mg IM repeated after 24 hrs. (24mg total in 2 doses) prevents RDS
 - ❖ To be routinely given between 32 - 34 weeks of gestation
- Tocolysis
 - ❖ Short term tocolysis is beneficial as delay in delivery helps prevent RDS / useful for transit to referral
 - ❖ Calcium channel blocker (Nifedipine) / Isoxsuprine is preferable
- Monitoring for infection
 - ❖ Pulse rate, temperature, uterine tenderness, foul smelling discharge, blood count (DC, TLC)
- Foetal surveillance
 - ❖ Clinical (FHR, DFMC)
 - ❖ Sonography
 - ❖ Electronic foetal monitoring (if available)
- Mode of delivery
 - ❖ Indications of caesarean section
 - ❖ Foetal compromise
 - ❖ Mal presentation
 - ❖ Unfavourable cervix
 - ❖ Failed induction of labour
- Neonatal care
 - ❖ Ideally in NICU
- Post natal care
 - ❖ Antibiotics for prevention of genital tract infection



PROM
34-36 WKS
(Same as for 37 weeks or more)

PROM
28 - 33 WKS



Leaking Membranes
< 28 weeks

Patient Counselling
Expectant / Induction

8. ANTEPARTUM HAEMORRHAGE

What is Antepartum haemorrhage [APH]:

Vaginal Bleeding after 28 wks of Pregnancy before birth of baby is called APH.

CAUSES

- Placenta previa
- Abruptio placetae
- Local causes (cervical or vaginal)

The first two are the most common life threatening causes of APH.

DIAGNOSIS

PLACENTA PRAEVIA

More common among multiparous woman. Higher the order of pregnancy more the chance of Placenta Previa.

General condition:

- Usually good
- Rarely in shock incase of massive haemorrhage. Shock is directly proportional to the amount of bleeding

Bleeding:

- Usually recurrent
- Apparently causeless (occasional history of prior intercourse)
- Not associated with pain abdomen unless woman is in labour

Condition of the uterus:

- Usually relaxed unless the woman is in labour
- Lower pole may be difficult to palpate in anterior placenta
- Often associated with Breech or Shoulder presentation
- FHR is usually normal

ABRUPTIO PLACENTAE

More common among primigravida woman however may be seen in multipara also. Usually associated with hypertensive disorders in pregnancy.

General condition:

- Tachycardia
- Distressed look of the woman
- Shock is more common than in placenta previa and is not directly proportional to the amount of bleeding.

Bleeding:

- Usually continuous

- May be associated with a cause i.e. Preclampsia / Eclampsia, hydramnios, anaemia and poor nutritional status.
- Always associated with pain abdomen.

Condition of the uterus:

- Usually tonically contracted, rigid and tender
- Very difficult to palpate foetal parts
- Usually associated with features of Foetal Distress or IUD

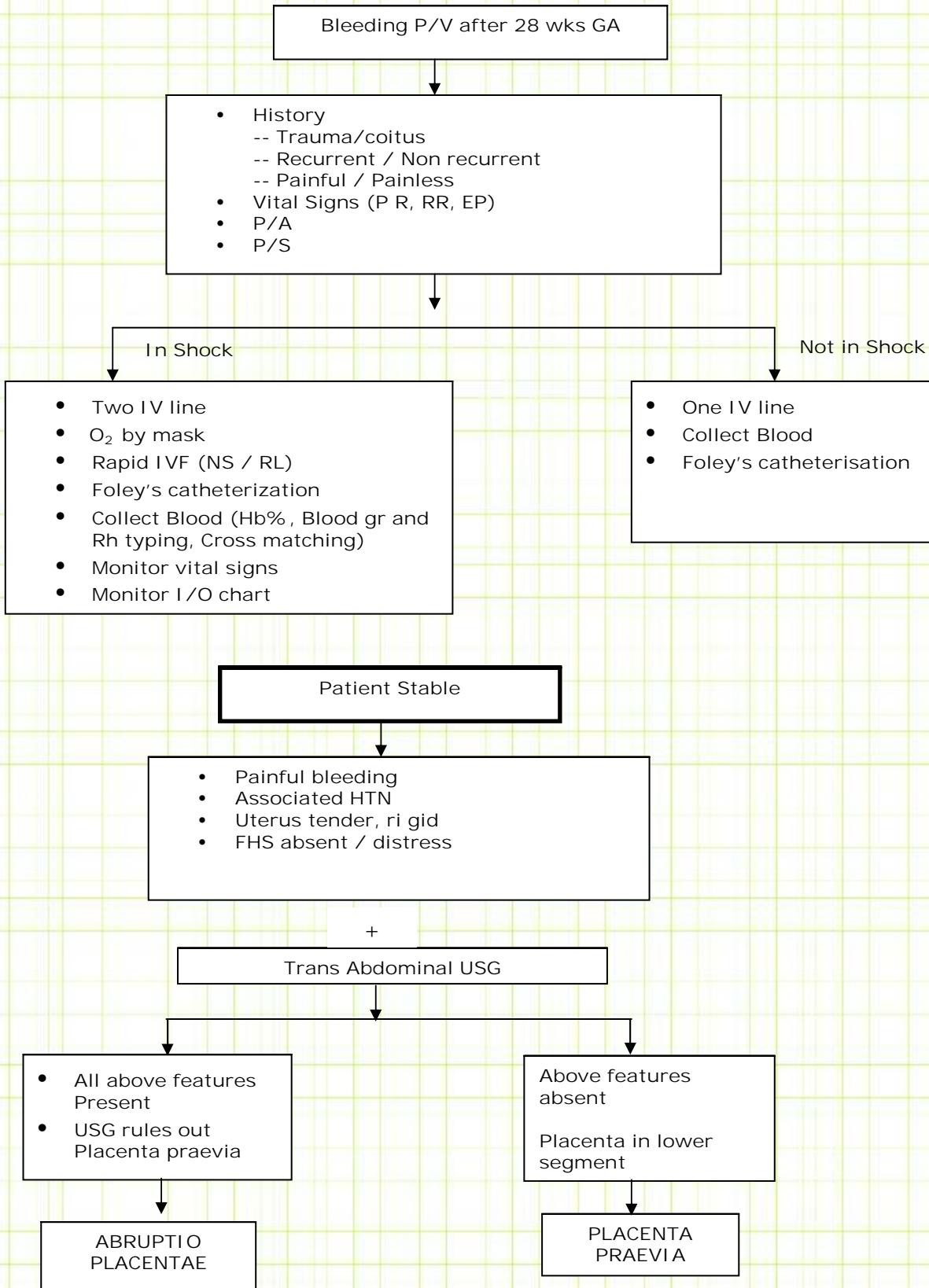
MANAGEMENT

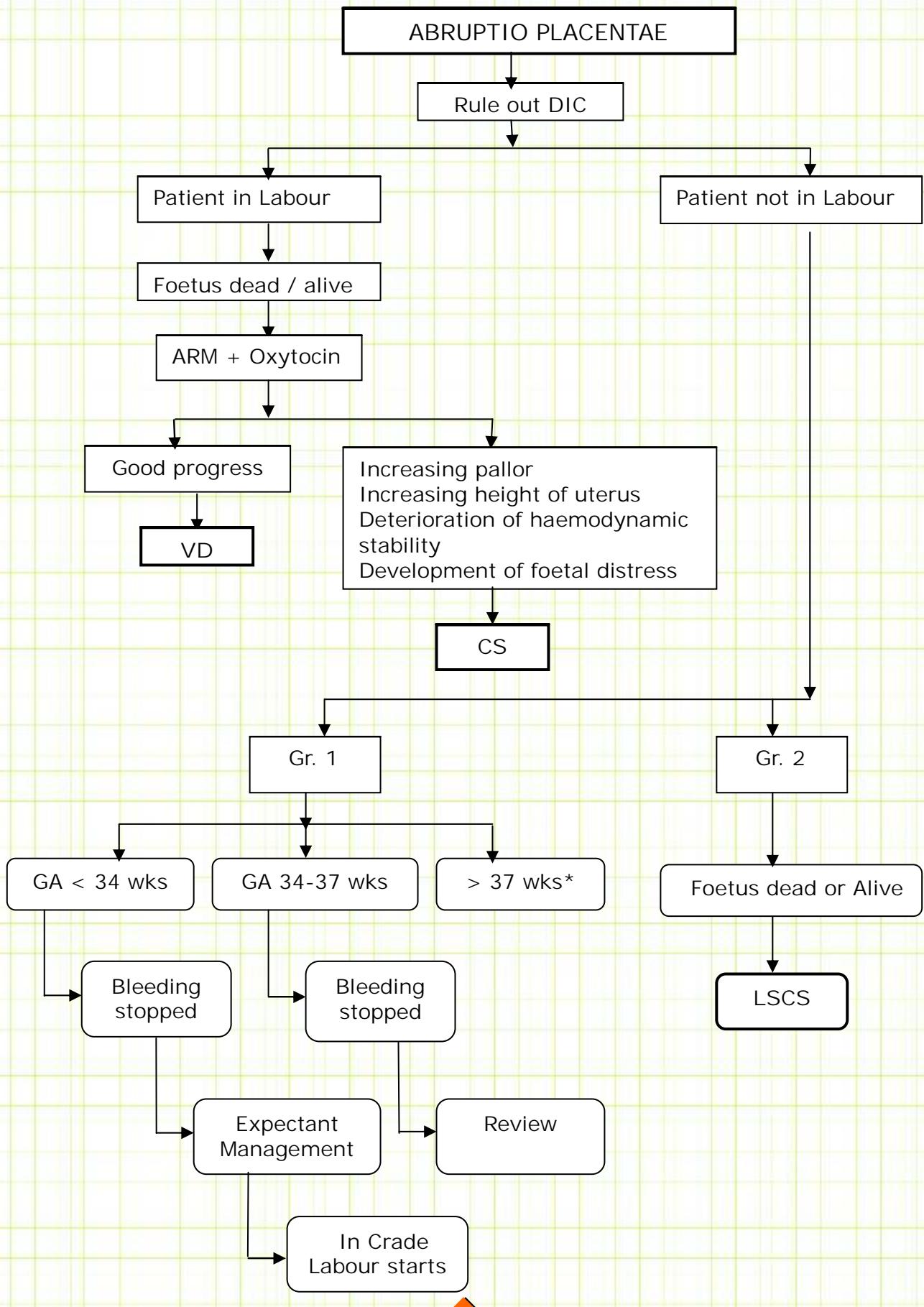
- ❖ Help and assistance is sought
- ❖ Rapid assessment of general condition is done
- ❖ IV infusion with large bore cannula or needle is started and infused rapidly
- ❖ Crystalloids IV fluids like Ringers's Lactate/ DNS/NS are superior to colloids in resuscitation
- ❖ Blood transfusion
- ❖ O₂ inhalation at a rate of 6-8L/min by mask or nasal cannula
- ❖ Lorazepam or Diazepam is given to reduce anxiety and distress if the woman is not in shock
- ❖ Bladder is catheterised and Intake/Output is monitored using a chart

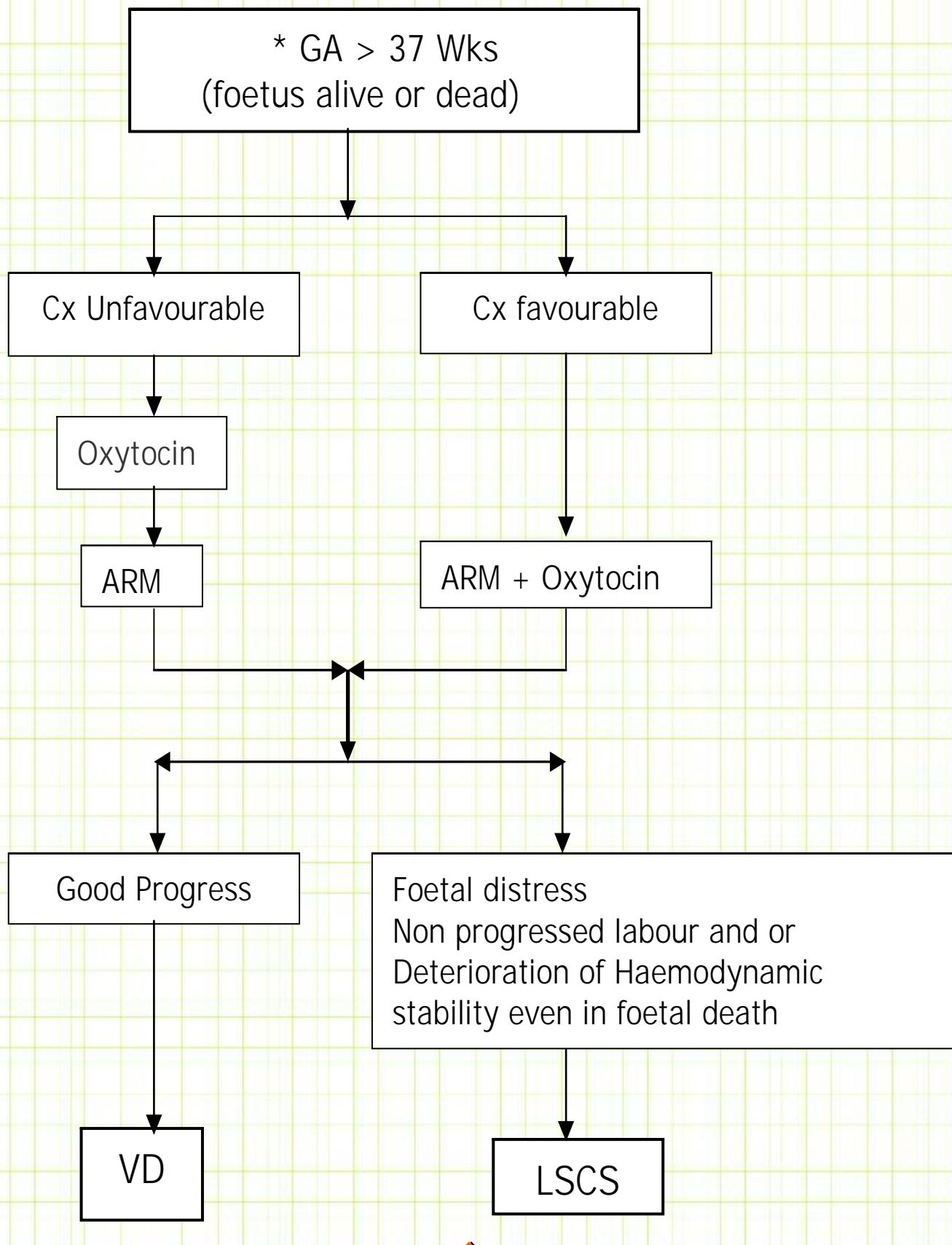
Investigations

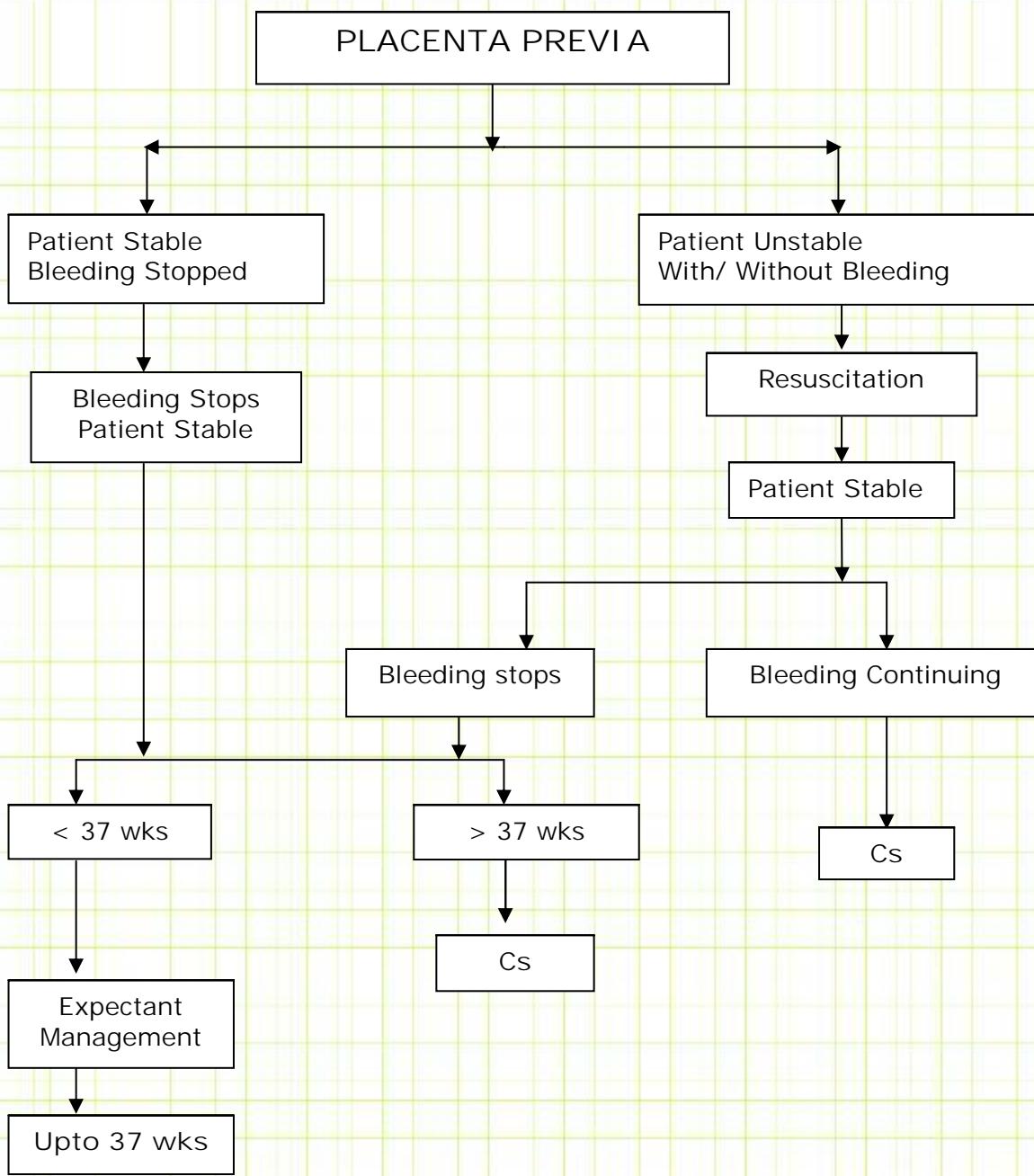
- ❖ Hb%, Grouping Rh Typing and cross matching
- ❖ Bedside coagulation profile.
- ❖ Urine for protein and sugar
- ❖ Ultrasonography
- ❖ Monitor vital signs
- ❖ Further obstetric management as per establishment of diagnosis

MANAGEMENT PROTOCOL FOR ANTEPARTUM HAEMORRHAGE









[Expectant management to be discontinued in case bleeding recurs or foetal death]

Patient Education:

With any amount of bleeding medical help should be sought immediately.

Referral Criteria :

All patients with A.P.H. should be referred to a well-equipped hospital having facility for Blood Transfusion, Emergency C.S., Neonatal Care Unit.

9. POST PARTUM HAEMORRHAGE (PPH)

Post partum haemorrhage is one major cause of maternal mortality. Blood loss more than 500ml from the genital tract following childbirth is the quantitative definition of PPH. In C. S. this amount is taken to be 1000mL. But more practical clinical definition states "any amount of bleeding from or into the genital tract following birth of the baby upto the end of the puerperium which adversely affects the general condition of the patient evidenced by rise of pulse rate and falling blood pressure is called postpartum haemorrhage.

TYPES

- a. PRIMARY - PPH which occurs within 24hrs following delivery, majority bleed within 2hrs. It is again of two types.
 - i. Third stage haemorrhage: Bleeding occurs before expulsion of placenta.
 - ii. True post partum haemorrhage : Bleeding occurs following expulsion of placenta (majority).
- b. SECONDARY - Haemorrhage occurs after 24hrs and within 6 weeks of delivery.

CAUSES:

1. Atonic (80 %)
2. Traumatic.
3. Mixed
4. Blood coagulopathy.

PREVENTION OF PPH

Prevention of PPH is the best form of management true to the philosophy of, "prevention is better than cure." And if not all, in the majority of cases PPH is preventable. For an anaemic patient small volume of blood loss will be detrimental and will be called PPH for her.

ANAEMIA SHOULD BE TREATED RELIGIOUSLY DURING PREGNANCY.

- ❖ EVERY DOCTOR SHOULD BE AWARE OF PPH.
- ❖ Prevention of uterine atony is key to reduce PPH.
- ❖ The cases at increased risk of uterine atony leading to PPH must be identified. These include Grandmultiparae, Case with over distended uterus commonly due to Multifoetal pregnancy, Polyhydramnios and Large baby; Preeclampsia, Eclampsia, Anaemia, APH, Obstructed labour, Prolonged labour, Pregnancy with fibroid, Prior induction/augmentation with oxytocin, Malformed uterus, Precipitate labour, IUD, H/O previous third stage complications and Jaundice in pregnancy.
- ❖ These patients should be delivered in a hospital with facilities for blood transfusion, under skillful supervision or referred to a tertiary care hospital.
- ❖ Routine practice of active management of 3rd stage of labour (AMTSL) which includes early oxytocic therapy (10 unit Oxytocin IM), late cord clamping and placental delivery by controlled cord traction following signs of placental separation and uterine massage, must be followed in all cases.

DIAGNOSIS

- ❖ In majority of cases vaginal bleeding is visible outside, as a slow trickle. On occasion, blood loss is very rapid and brisk and death may occur within a few minutes. State of the uterus with the type of bleeding gives very important and reliable clue to the cause of PPH
- ❖ In traumatic PPH the uterus is contracted and the type of bleeding is variable in amount, continuous and bright red in colour.
- ❖ In atonic PPH Uterus is soft and flabby. The bleeding is usually dark coloured, large in amount coming out in intermittent gushes coinciding with uterine relaxation.
- ❖ One should always keep in mind that sometimes both atonic and traumatic cause may co-exist particularly following instrumental vaginal deliveries.
- ❖ Uterus is not felt per abdomen with a protruding vaginal mass and patient in shock is usually due to inversion of uterus.

MANAGEMENT

- ❖ Shout for help.
- ❖ Urgently mobilize and involve all available medical personnel.
- ❖ Quick evaluation of general condition of the woman is made (Pulse, BP, Respiration and Air way).
- ❖ If in shock, treatment started immediately. Even if signs of shock are not present it should be kept in mind that the patient's condition may worsen any time.
- ❖ The uterus massaged carefully to stimulate contraction and retraction to reduce blood loss as well as to expel blood and blood clots. Blood clots trapped in uterus inhibit effective uterine contraction.
- ❖ A wide bore I.V. canula (No – 18G) is fixed to a large vein and IV fluids with Oxytocin started. Blood is sent for Grouping and Rh typing (if not already done) and for cross matching of requisition of blood.
- ❖ Bladder is catheterized as full bladder inhibits uterine contraction.
- ❖ Check placenta and see if it is complete or there are missed cotyledons.
- ❖ Examination of the cervix, vagina, perineum (episiotomy wound and lacerations), para-urethral region is to be done and repaired as and when required.
- ❖ If uterus is atonic and fails to contract uterine massage is to be continued.
- ❖ Use of oxytocic drugs can be given together or sequentially.
- ❖ Need for blood must be assessed early and transfused as early as necessary.
- ❖ If bleeding continues placenta is again thoroughly examined. If there are signs of retained placental fragments, it must be removed.
- ❖ Status of coagulation is assessed using a bedside clotting test. Failure of a clot to form after 7minutes or a soft clot that breaks down easily suggests – coagulopathy. Coagulopathy may occur in abruptio placentae, jaundice in pregnancy, Thrombocytopenic purura, HELLP syndrome or in IUD.
- ❖ Still bleeding continues, bimanual compression of the uterus is to be performed by placing the right hand fist in anterior fornix and pressure is given against anterior wall of uterus. Left hand is pressed deeply into the abdomen behind the uterus and pressure is applied to the posterior wall of uterus so as to keep the uterus pressed in between both hands.

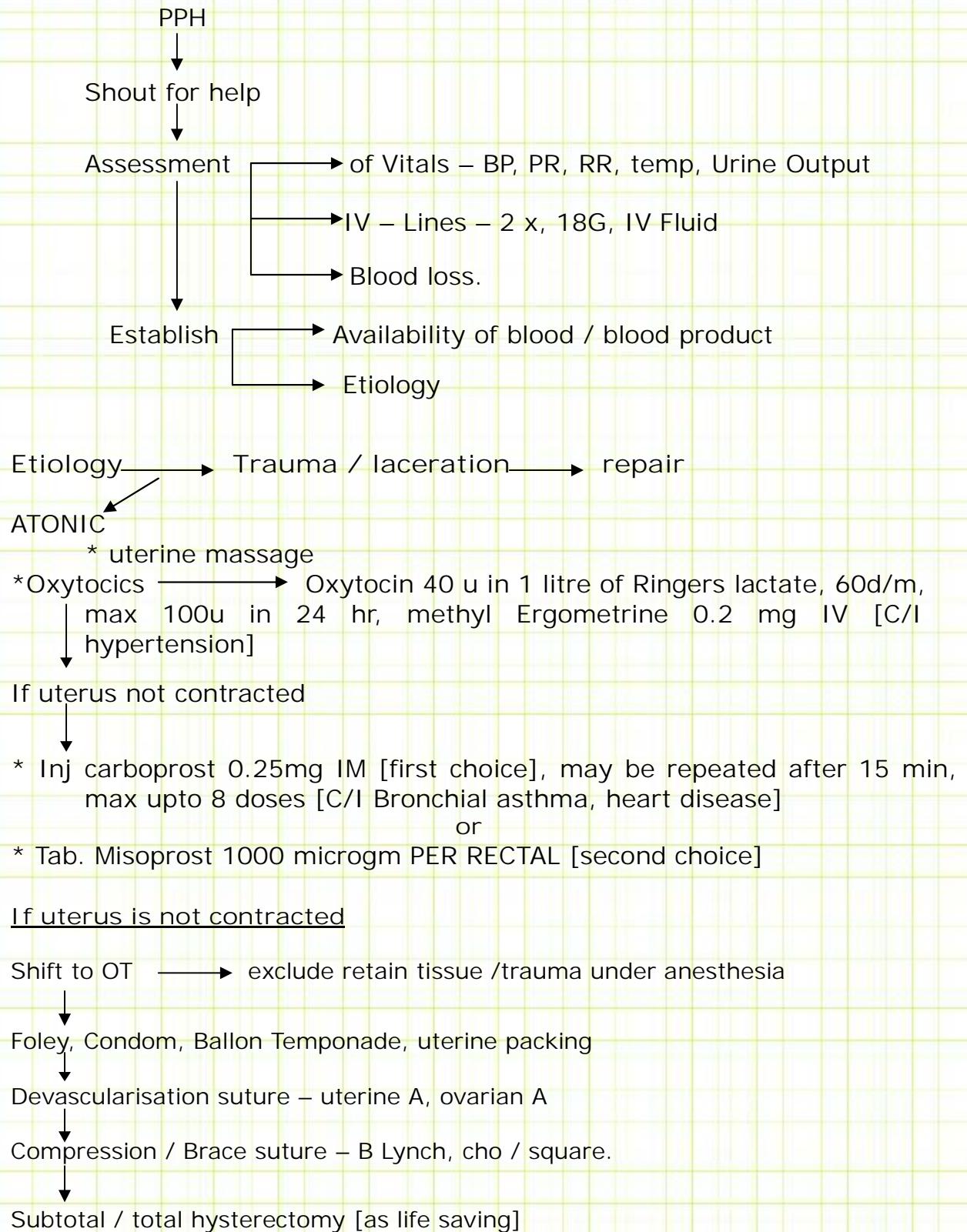
- ❖ The assistant is asked to compress the aorta by giving downward pressure just above the umbilicus slightly to left. If pressure is adequate femoral pulse will not be palpable.
- ❖ If bleeding continues in spite of all this, the patient is taken to the OT.
- ❖ Uterine and ovarian artery ligation is performed and compression sutures may also be given (B Lynch or Cho).
- ❖ If life-threatening bleeding continues subtotal hysterectomy must be performed.

Use of Oxytocic Drugs

	Oxytocin	Ergometrine / Methyl-ergometrine	15-methyl prostaglandin F2 (Carboprost)	Misoprostol
Dose and route	IV infusion 40 units in 1L IV fluids at 60drops per minute IM: 10units	IM or or IV (slowly): 0.2mg	IM: 0.25mg	1000 µgm per rectally
Continuing dose	IV: Infusion 40 units in 1L IV fluids at 40 drops per minute	Repeat 0.2mg IM after 15minutes, if required give 0.2mg IM or IV (slowly) every 4hours	0.25mg every 15minutes	
Maximum dose	Not more than 3 L of IV fluids containing oxytocin	5 doses (Total 1.0mg)	8 doses (Total 2mg)	
Precautions / contraindications	Not to be given as an I.V. bolus	Pre-eclampsia, hypertension, heart disease	Never to be used I.V. C/I Asthma, heart disease	

Initial dose of Oxytocin can be increased by increments of 10 units/L depending on response. Prostaglandins should not be given intravenously. They may be fatal.

PROTOCOLS FOR PPH MANAGEMENT



RETAINED PLACENTA

- ❖ If placenta is not expelled out even after 30 minutes of the birth of the baby, it is defined to be a case of retained placenta.

MANAGEMENT

- ❖ The bladder is catheterized.
- ❖ Oxytocin I.V. Infusion is started with 40 units/L at 40-60 drops/minute. Alternatively Oxytocin 10 units is given I.M., if not already given.
- ❖ Position of placenta is looked
- ❖ If it is in vagina it is removed.
- ❖ Ergometrine may not be given because it is thought to cause tonic uterine contraction, which may delay expulsion.
- ❖ If placenta is undelivered after oxytocin stimulation and uterus is contracted, then controlled cord traction is tried.
- ❖ Forceful cord traction and application of fundal pressure is avoided as they may cause uterine inversion.
- ❖ If controlled cord traction is unsuccessful manual removal of placenta (MROP) must be done under anaesthesia in OT.

10. CAESAREAN SECTION

LOWER SEGMENT CAESAREAN SECTION

It is an operative procedure whereby the foetuses after the end of the 28th week are delivered through an incision on the abdominal and uterine walls. When incision is made in the lower segment of uterus it is called as lower segment caesarean section.

Indications:

- ❖ Previous more than one CS
- ❖ Previous one CS with recurrent indication like CPD
- ❖ Previous one CS with breech presentation
- ❖ Previous one CS with any complication during pregnancy
- ❖ Central placenta previa (Type II posterior, Type III and Type IV)
- ❖ Malpresentations
- ❖ Multiple pregnancy with first foetus in non-vertex presentation
- ❖ CPD
- ❖ Foetal distress in first stage of labour
- ❖ Deep Transverse Arrest
- ❖ Some cases of Eclampsia
- ❖ These are some of the common indications. However there are some more less common indications.

Pre-operative preparation:

- ❖ Informed written consent for the procedure, anaesthesia and blood transfusion should be obtained
- ❖ Pre-medicative sedation is withheld
- ❖ Abdomen should be scrubbed with soap
- ❖ Abdomen and perineum should be shaved
- ❖ 30ml of antacid is given orally
- ❖ Ranitidine 50mg IV is given 1 hour before surgery
- ❖ Metoclopramide 10mg IV is given in the theatre
- ❖ The stomach should be emptied, if necessary by a stomach tube
- ❖ Foley's catheter is given
- ❖ Review of indication and ensuring that vaginal delivery is neither safe nor possible
- ❖ Foetal heart sounds should be re-checked
- ❖ An IV infusion to be started
- ❖ Neonatologist should be made available

Anaesthesia:

May be spinal, epidural, or general anaesthesia.

Procedure:

Position of the patient

Patient should be placed in the dorsal position. The operating table should be tilted to the left or a pillow is placed under the woman's right lower back to decrease supine hypotension syndrome.

Antiseptic painting

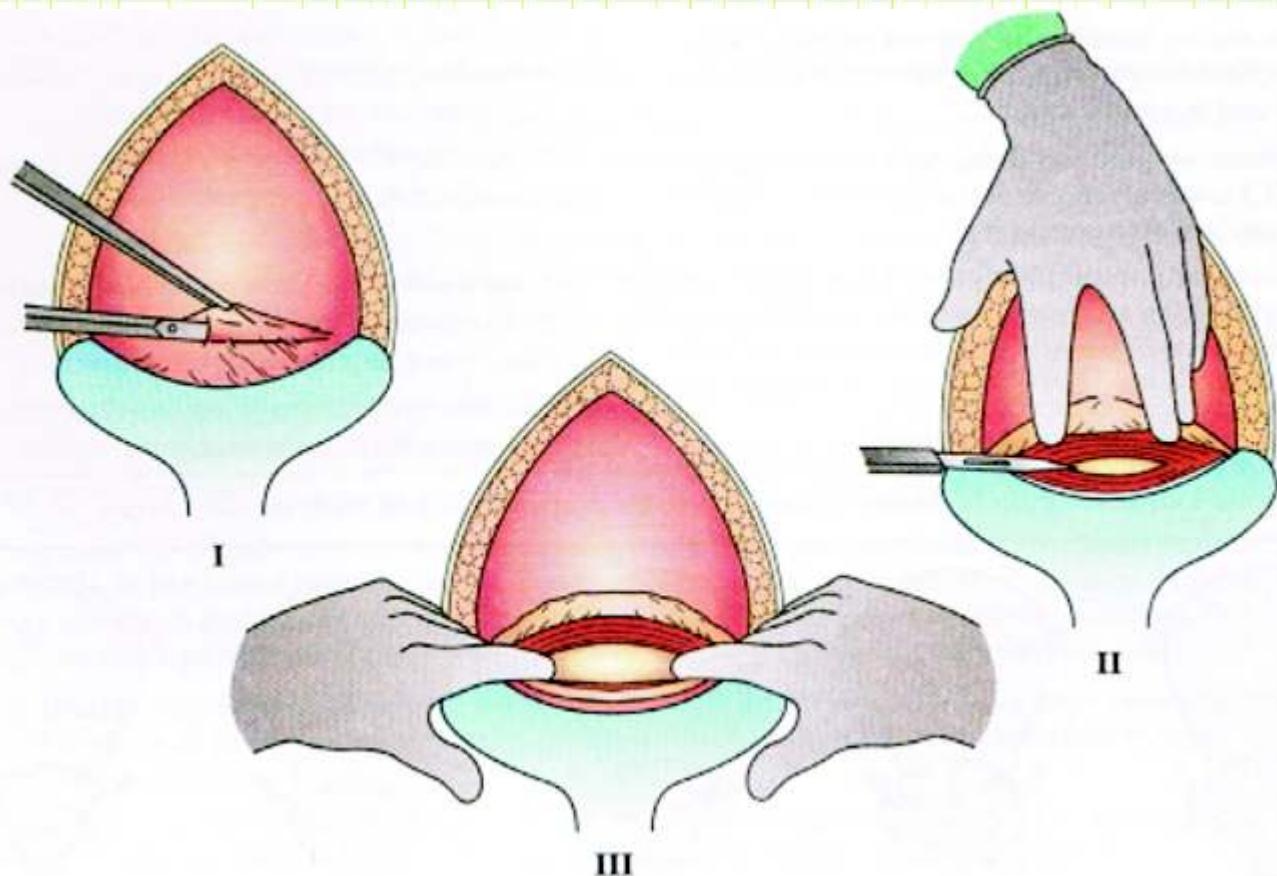
Abdomen should be painted with antiseptic lotion from xiphisternum to mid-thigh and laterally upto both anterior axillary lines. The abdomen should then be draped with sterile towels.

Incision on the abdomen

- A transverse incision of at least 15 cms. long should be given about 2 cm above the symphysis pubis. A vertical incision is preferred in obstructed labour and ante-partum haemorrhage. Skin and subcutaneous tissue should be cut transversely. Then the rectus sheath should also be cut transversely and separated from the rectus muscle. The rectus muscle is separated in the midline and then the parietal peritoneum becomes visible.
- An opening is made in the peritoneum after lifting it to prevent bowel injury. It should then be lengthened vertically and bladder injury is to be prevented at the lower end.
- A Doyen retractor should be placed over the pubic bone to retract the bladder.
- Forceps is used to pick up the loose peritoneum covering the lower segment and it is cut transversely with scissors.
- The incision is extended by placing the scissors between the uterus and visceral peritoneum and it is cut about 3-4cm on each side of the midline in a transverse fashion
- The bladder is pushed down the lower uterine segment using 2 fingers. The Doyen's retractor is replaced over the bladder and the pubic bone.

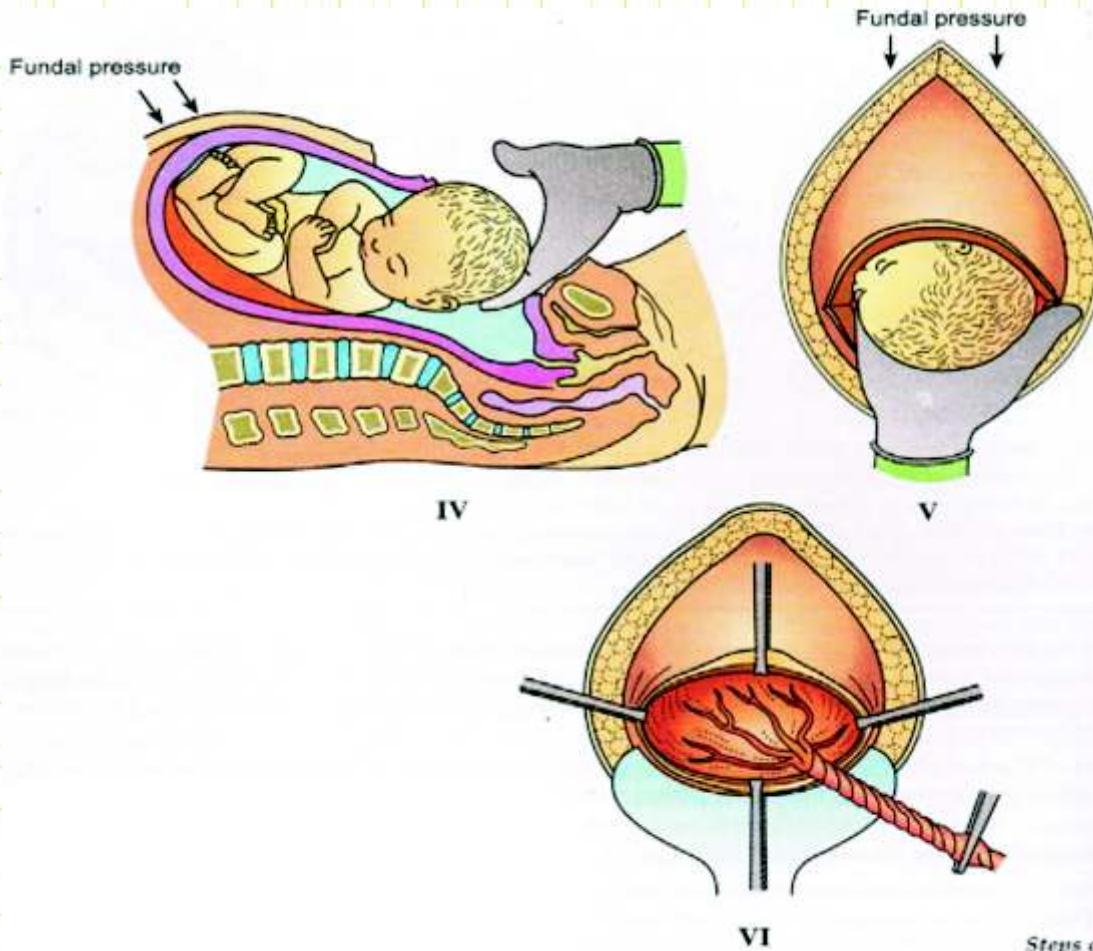
Opening the uterus

- A scalpel is used to make a 3 cms. transverse incision on the lower segment of the uterus. It should be about 1 cm below the level where the utero-vesical fold of peritoneum was incised
- The incision is widened by placing a finger at each edge and gently pulling upwards and laterally at the same time
- If the lower segment is thick and narrow, the incision is extended in a crescent shape, using scissors instead of fingers to avoid extension up to uterine vessels
- It is important to make the uterine incision big enough to deliver the head and body of the baby without extension of the incision
- Lower segment vertical incision may be given when lower segment is not formed as in a case of transverse lie or premature delivery.



Delivery of the baby and the placenta

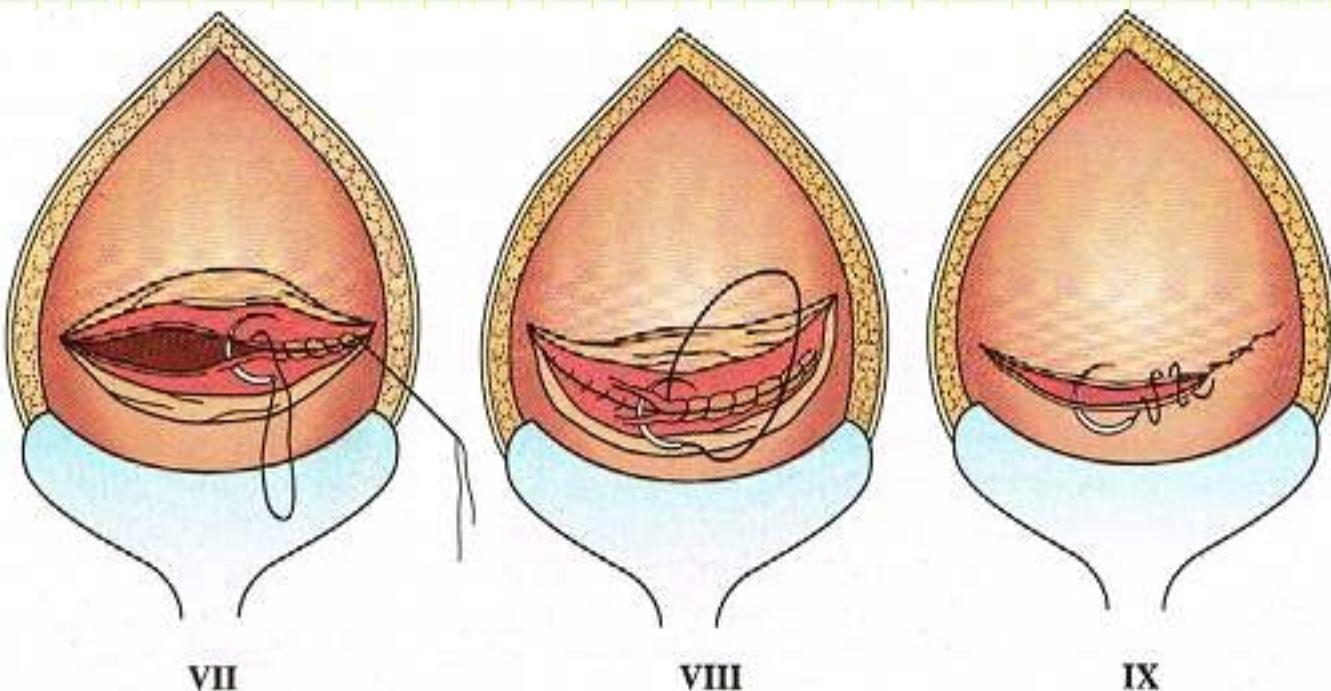
- ❖ The Doyen's retractor is removed.
- ❖ One hand is placed between the baby's head and the uterus.
- ❖ With the fingers the head is grasped and it is flexed.
- ❖ The baby's head is lifted gently through the incision.
- ❖ With the other hand the abdomen is gently pressed over the top of the uterus to help the delivery of the head.
- ❖ If the baby's head is deep down in the pelvis or vagina, an assistant should be asked to push the head through the vagina wearing a sterile glove, then the head is lifted and delivered.
- ❖ The baby's mouth and nose is sucked when delivered.
- ❖ The shoulders and body is now delivered.
- ❖ Inj. Oxytocin 20 u in 500ml of IV fluid is started at 60 drops per min for 2 hours.
- ❖ The umbilical cord should be clamped and cut.
- ❖ The baby is handed over to the assistant for initial care.
- ❖ One dose of prophylactic antibiotic is given after the cord is clamped and cut.
- ❖ By this time the placenta is likely to be separated. Keep gentle traction on the cord with simultaneous pushing of the uterus towards the umbilicus using the left hand.
- ❖ The membranes should be carefully removed and even a small piece, if attached to decidua should be removed using a dry gauge.



Steps contd..

Closing the uterine incision

- ❖ The corners of the uterine incision are grasped with green armytage or sponge holding forceps.
- ❖ The lower segment margins should be grasped and made sure that it is separated from the bladder.
- ❖ Thorough examination is done to look carefully for any extension of the uterine incision.
- ❖ If extension is present, it should be repaired first.
- ❖ Uterus is closed in 3 layers. First layer, consisting of deeper layers of myometrium is closed by continuous sutures with no. 1 chromic catgut mounted on curved atraumatic needle, the second layer, consisting of rest of the myometrium is closed by continuous sutures using the same suture material burying the first layer beneath it. The third layer is the visceral layer of peritoneum, which is closed by continuous sutures with no. (1-0) chromic catgut mounted on curved atraumatic needle taking care only to appose the margins and not to make it tight.
- ❖ If there is any further bleeding from the incision site it should be dealt with reinforcement of figure of eight sutures.



Closing the abdomen

- Look carefully at the uterine incision before closing the abdomen, it should be made sure that there is no bleeding and the uterus is firm.
- The abdomen should be cleaned by suction or a sponge and instrument and mop count is verified.
- Parietal peritoneum is closed by continuous sutures with no. (1-0) chromic catgut mounted on curved atraumatic needle.
- The rectus sheath is closed by continuous sutures with no. (1) Polyglactin sutures.
- The skin is closed by vertical mattress with no. (2-0) braided silk or no. (2-0) polyamide.
- Sterile dressing is applied over the wound.
- The clots from the vagina should be removed and it should be cleaned with antiseptic lotion.

PROBLEMS DURING SURGERY

- If bleeding is not controlled and it is not due to tears then follow the steps of management of atonic PPH as described earlier.

Post-op care

- The patient should be observed meticulously for at least 6-8hrs
- Periodic check up of pulse, BP, and vaginal bleeding is mandatory
- 2.5-3 litres of IV fluid should be given in the form of RL, 5% dextrose, 0.9% NS over 24 hrs.
- Inj. Oxytocin 20 units per litre should continue for at least 6 – 8 hrs following CS.
- Prophylactic antibiotics, analgesics, ranitidine are to be given parenterally for 72hrs then orally for 5 days.
- Oral fluids should be given on 2nd day and light solid diet should be started from 3rd day

- The stitches should be removed on 6th day
- The patient should be discharged following the removal of stitches if otherwise fit. She should be asked for postnatal check-up after 6 weeks
- The baby should be put to breast within 1 hr of delivery and exclusive breast feeding is to be continued upto 6 months

Complications

Intra-operative

- Extension of uterine incision
- Uterine lacerations
- Bladder injury
- Ureteral injury
- Bowel injury
- Uterine atony and primary PPH
- Morbid adherent placenta

Immediate post-operative

- PPH
- Shock
- Anaesthetic hazards
- Infection
- Intestinal obstruction
- Thromboembolic disorders
- Wound complications

Remote

- Incisional hernia
- Intestinal obstruction
- Risk of scar rupture in future pregnancy and labour

11. PUERPERAL SEPSIS

WHAT IS PUERPERAL SEPSIS?

It is infection of the genital tract, which occurs during six weeks following delivery, but it is more commonly encountered during the first two weeks.

PREDISPOSING FACTORS

- Malnutrition and anemia
- Chronic debilitating illness
- Prolonged rupture of membranes > 18 hrs
- Repeated vaginal examinations
- Dehydration and ketoacidosis during delivery
- Traumatic operative delivery
- APH and PPH
- Retained bits of placenta and membranes
- Caesarean Section
- Domiciliary delivery

MICRO-ORGANISMS RESPONSIBLE

Aerobes: Streptococcus hemolyticus group A and B
 Staphylococcus aureus, staph epidermidis
 E.coli
 Klebsiella
 Pseudomonas

Anaerobes: Anaerobic streptococcus
 Bacteroides
 Clostridia

CLINICAL MANIFESTATIONS

Local infection

- ◆ There is slight rise of temperature, generalized malaise or headache.
- ◆ The local wound becomes red and swollen.
- ◆ There may be purulent discharge and disruption of wound.
- ◆ When severe, there is high-rise of temp with chills and rigor.

Uterine infection - Mild

- ◆ There is fever and tachycardia.
- ◆ Lochial discharge is offensive and copious.
- ◆ Uterus is subinvolved and tender.

Severe

- ◆ There is high-rise of temp with chills and rigor.
- ◆ Tachycardia is out of proportion to temperature.
- ◆ Lochia may be scanty but foul smelling.
- ◆ Uterus is subinvolved, tender, and soft.
- ◆ There may be associated wound infection.

Spreading infection

Parametritis

- ◆ The onset is usually on 7- 10th day of puerperium.
- ◆ Constant pelvic pain
- ◆ Tenderness on either side of hypogastrium.
- ◆ Vaginal examination reveals an unilateral tender indurated mass pushing the uterus to opposite side.
- ◆ Rectal examination confirms the induration, specially extending along the uterosacral ligament.
- ◆ It takes a few weeks to resolve completely.

Pelvic peritonitis

- ◆ Fever with tachycardia
- ◆ Mucous diarrhoea
- ◆ Lower abdominal pain and tenderness.
- ◆ Vaginal examination reveals tenderness in the fornices and with movement of cervix.
- ◆ Collection of pus in the pouch of Douglas is evident by swinging temperature, diarrhea and a bulging fluctuant mass felt through posterior fornix.

Generalized peritonitis

- ◆ High fever with tachycardia
- ◆ Vomiting
- ◆ Generalized abdominal pain
- ◆ Patient looks very ill and dehydrated
- ◆ Abdomen is tender and distended
- ◆ Clinical signs of pus (fluid) inside abdomen present

Pelvic thrombophlebitis

- ◆ There may be swinging temp with chills and rigor
- ◆ Lower abdominal pain
- ◆ Swelling of legs
- ◆ Pyrexia continues for more than a week inspite of antibiotic therapy
- ◆ May be retrograde extension to iliofemoral veins.

Septicemia

- ◆ High fever, rigor, tachycardia and hypotension
- ◆ Blood culture is positive
- ◆ Symptoms and signs of metastatic infection in the lungs, meninges or joints may appear.

Septic shock

It is due to bacterial endotoxin causing circulatory inadequacy, decreased tissue perfusion, oliguria and adult respiratory distress syndrome.

INVESTIGATIONS

1. Hb%, DC, TLC, total platelet count, thick blood smear for MP.
2. Blood urea and creatinine
3. High vaginal and endocervical swab for culture and sensitivity
4. Urine for culture and sensitivity
5. Blood culture
6. Pelvic ultrasound
7. Xray chest

TREATMENT

GENERAL CARE

- ◆ Isolation is preferred especially when group B hemolytic streptococcus infection is suspected.
- ◆ Adequate fluid and calories is supplied if needed by IV infusion
- ◆ Anemia is corrected by oral or injectable iron and if needed by blood transfusion
- ◆ Pain is relieved by adequate analgesia
- ◆ An indwelling catheter is given
- ◆ A chart is maintained by recording pulse, temp, respiration, Lochial discharge, fluid intake and output

ANTIBIOTICS

Ideal antibiotic regime should depend on the culture and sensitivity report.

Pending the report

Ampicillin (1g IV 6hrly) + Gentamicin (80mg IM BD) + Metronidazole (500mg IV 8hrly)

OR

Cefotaxime (1g IV BD)+ Gentamicin(80mg IM BD) + Metronidazole is given for 7-10 days.

SURGICAL TREATMENT

Surgery has a minor role in the treatment of puerperal sepsis.

Perineal wound

If sepsis is present, stitches are to be removed to drain pus. The wound is to be dressed with hot compress and mild antiseptic lotion followed by application of antiseptic ointment.

Retained placental bits

With a diameter of more than 3cm are to be removed. Surgical evacuation after antibiotic coverage for 24hrs is to be done.

Pelvic thrombophlebitis

Treated with IV Heparin for 7-10 days alongwith antibiotics.

Pelvic abscess

Should be drained by colpotomy.

Pelvic or generalized peritonitis

Maintenance of electrolyte balance by IV fluids along with appropriate antibiotic therapy usually controls the peritonitis. But in unresponsive cases, laparotomy is indicated. If no pathology is found, drainage of pus may be effective. Hysterectomy is indicated in cases with rupture, perforation, multiple abscess, gangrenous uterus or gas gangrene infection. Ruptured tubo ovarian abscess should be removed.

Septic Shock

Management includes fluid and electrolyte balance, respiratory supports, circulatory support with dopamine or dobutamine, infection control with intensive antibiotic therapy, surgical removal of septic foci and specific treatment like dialysis for renal failure etc.

12. GESTATIONAL DIABETES MELLITUS

Introduction

- Most common medical complication during pregnancy, responsible for high perinatal morbidity and mortality.
- Incidence varies according to ethnicity and selection criteria. Overall incidence is 1-14% (5-8% among Asians).
- Gestational Diabetes Mellitus (GDM) constitutes approximately 87.5% of all diabetic cases during pregnancy. Type 1 DM is 7.5% and type 2 is responsible for 5% of cases. But due to lifestyle factors and dietary habits, incidence of type 2 DM is increasing these days. Of all GDM patients, >50% develop type 2 DM in later life.

Screening for GDM

ACOG and WHO recommend universal screening at 24-28 weeks. Patients with risk factors should be screened as early as possible.

In our country also it is recommended that all pregnant women should be screened.

Methods for screening and diagnosis

Two step method (Glucose Challenge Test followed by Glucose Tolerance Test) (Recommended by ADA)

- Glucose Challenge Test: Irrespective of previous meal, patient is given 50 gm glucose load and blood glucose levels are tested after 1 hour value 140mg/dl is taken as cut-off for doing GTT.
- Glucose Tolerance Test

	Glucose load	Thresholds (mg/dl) (venous plasma)				
		Fasting	1-hour	2-hour	3-hour	
WHO*	75g (WHO)		126 (7.0 mmol/l)		126 (7.0 mmol/l)	

* One or more glucose value must meet threshold.

One step diagnosis of GDM

WHO recommends one-step approach of diagnosis of GDM to avoid inconvenience to patients due to repeated blood testing. Patient is given 75g glucose load after overnight fasting. Glucose challenge test is not required for this method.

MANAGEMENT OF DIABETES IN PREGNANCY

Medical management

1. Medical nutrition therapy: Primary therapy for 30-90% of women diagnosed with GDM. Blood sugar monitoring should be done after 1-2 weeks of starting diabetic diet till 36 weeks, then weekly.

Calorie calculation – 24-hour calories recommended

- ❖ BMI – 19-27.5 kg/sq.m : 30-35 kcal/ kg of ideal body weight
- ❖ Underweight women (BMI <19 kg/sq.m): 35-40 kcal/kg/day
- ❖ Overweight women (BMI >35 kg/sq.m): 25-30 kcal/kg/day

Composition of diet – It should include carbohydrates (50-55%), proteins (20-30%) and fats 20-30% with saturated fat <10%

2. Exercise: 3- 4 times weekly for 20-30 min / session.

Recommended glycemic goals in patients on diet:

	Venous plasma (mg/dl) 2-hour postprandial
Fasting	<95
1- hour postprandial	<140
2- hour postprandial	<120

If 50% values are deranged, then insulin should be started along with diabetic diet.

INDICATIONS TO START INSULIN THERAPY

- MNT therapy fails to achieve glycemic goals within two weeks.
- Foetal abdominal circumference (AC) at 29-33 weeks is more than 75 percentile.

Target glucose levels in patients on insulin

Time	Venous plasma glucose levels (mg/dl)
Fasting (BBF)	60-90
Before lunch, dinner, bedtime snack	60-105
After meals (2-hour)	<120
2:00 – 6:00 am	>60

Insulin therapy

Calculate total dose = (2/3 in morning + 1/3 in evening)
(e.g., 90U = 60U + 30U).

	Short-acting insulin	Intermediate – acting insulin
Morning (60U)	1/3 (20U)	2/3 (40U)
Evening (30U)	½ (15U, before dinner)	½ (15U, HS)

With intermediate-acting insulin, there is more chance of delayed hypoglycemia. So, rapid insulin (short-acting) is preferred nowadays and is used more frequently during pregnancy. It provides better control over blood sugar and thus improved maternal and foetal outcome.

Obstetrical management

GDM on diet

- Induction at 38-40 weeks depending upon monitoring.
- History of stillbirth, hypertension, uncontrolled blood sugars – biweekly nonstress test (NST) is stated at 32 weeks onwards.

GDM on Insulin

Antepartum foetal surveillance is done as in patients with pregestational diabetes. Elective induction is done at 38 completed weeks.

Management of pregestational diabetes mellitus in pregnancy

Special investigations during pregnancy (Optional, if practicable)

- First trimester: HbA1C levels, biochemical screening (10 weeks) – PAPP – A, -hCG, USG (11-12 weeks) for nuchal translucency.
- Second trimester: Triple screen (16-18 weeks), level II scan (18-22 weeks) foetal echocardiography (20-22 weeks), growth and liquor volume (26-28 weeks)
- Third trimester: USG for growth parameters
Antepartum foetal monitoring to prevent IUD and plan delivery.

Timing of delivery

- ❖ Plan for induction at 38 weeks.
- ❖ Elective LSCS if foetal weight $> 4\text{ kg}$.

Elective LSCS of a diabetic patient is planned early morning.

- ❖ Usual night-time dose of insulin is given and morning dose is omitted.
- ❖ Patient is kept NPO.
- ❖ Fasting blood sugar and urine testing (sugar and ketones) is done. If FBS is $< 70\text{ mg/dl}$, 5% dextrose is started. If FBS is $> 100\text{ mg/dl}$, insulin infusion with DNS is started.
- ❖ Regular RBS monitoring is continued.

Intrapartum Management

- ❖ Insulin dose is omitted on day of induction.
- ❖ Regular glucose monitoring is done every 2-3 hourly in latent phase and every 1-2 hourly in active phase of labor.
- ❖ Urine testing for sugar and ketones is also done.
- ❖ Patient is kept well-hydrated.
- ❖ Regular insulin is given to meet the maternal requirement during labor.
- ❖ Insulin is given in form of low-dose infusion from depending upon blood sugar levels.
- ❖ Prophylactic antibiotics.

Postpartum management

Vaginal delivery

GDM patients on diet do not need any monitoring. Those who are on insulin, blood sugar (fasting and post-prandial) should be done before discharge.

Pregestational diabetes: Patient is started on diabetic diet. Insulin is decreased to half of prepregnancy dose or $1/3 - \frac{1}{2}$ of pregnancy dose (if prepregnancy dose is not known).

Caesarean section

Blood sugar monitoring is done 4-6 hourly. Regular insulin is given if RBS is $> 140-150$ mg% in first 24-48 hours. Once patient starts taking regular diet, insulin dose is adjusted.

Postpartum glucose testing

Patients who are diagnosed to have GDM during pregnancy are subjected to oral glucose tolerance test with 75g glucose.

Normal	Diabetes mellitus	Impaired glucose tolerance
FBG (< 110 mg/dl)	7.0 mmol/l (126 mg/dl)	6.1 - 7.0 mmol/l (110 – 125 mg/dl)
2 - hour (< 140 mg/dl)	11.1 mmol/l (200 mg/dl)	7.8 mmol/l (140 – 199 mg/dl)

Depending upon where the patient has impaired glucose tolerance or frank diabetes, she is advised for diabetic diet, oral hypoglycemics, insulin, benefits of weight control, exercise and regular physician evaluation to control and prevent the long-term complications of diabetes mellitus.

Biguanides (Metformin)

- ❖ Studies have shown that it reduces the incidence of first trimester spontaneous abortions in these patients and is not associated with any major congenital malformations.
- ❖ Dose is usually started with 500mg HS, and is slowly increased upto 2,250 mg/day.
- ❖ Contraindicated in presence of renal disease.
- ❖ Insulin is added if glycemic control is not achieved.

Contraception

- ❖ Barrier methods have high failure rates.
- ❖ Intrauterine devices (copper containing and LNG containing) – considered ideal for diabetic women. These do not affect glucose metabolism.
- ❖ Progesterone Only Pills (POPs): Avoid in lactating women because of risk of decrease in glucose tolerance and insulin sensitivity. These should be used only when estrogen is contraindicated that too in non-lactating women.
- ❖ Women who have completed their family should be offered ligation when possible.

ESSENTIAL MEDICINE LIST (PREGNANT WOMEN) 2011 - 2012

JANANI -SHI SHU SURAKSHA KARYAKRAM (JSSK)

Health & FW Department, Government of Orissa.

Total Sl. No.	Sl. No.	Drug Code	Name of the drug / item	Pharma Standard.	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
Antenatal Period							
1	1	D16002	Tab. Folic Acid (Aluminium foil/Blister pack)	IP	5 mg/Tab	10 Tabs/Strip 10 Strips/Box	90
2	2	D16009	Tab. Ferrous Sulphate + Folic Acid (Sugar Coated) (Aluminium foil/Blister pack)	IP	Equivalent to 100 mg of Elemental Iron + Folic Acid 0.5mg	10 Tabs/Strip 10 Strips/Box	180
3	3	D16017	Tab. Doxylamine Succinate + Pyridoxine (Aluminium foil/Blister pack)	IP	Doxylamine Succinate 10 mg + Pyridoxine 10 mg / Tab.	10 Tabs/Strip 10 Strips/Box	30
4	4	D30001	Tab. Calcium (Film coated) (Aluminium foil/Blister pack)	IP	500mg Elemental Calcium per Tab	10 Tabs/Strip 10 Strips/Box	180
5	5	D23005	Inj. Tetanus Toxoid (adsorbed)	IP	0.5 ml/Amp	0.5 ml/Amp 20 Amps/Box	2
Pre-Eclampsia and Eclampsia							
6	1	D17020	Tab. Methyl Dopa (coated) (Aluminium foil/Blister pack)	IP	250 mg of anhydrous Methyldopa/Tab	10 Tabs/Strip 10 Strips/Box	120
7	2	D17044	Cap. Nifedipine (Soft gelatin capsule) (Aluminium foil/Blister pack)	IP	10 mg/Cap	10 Caps/Strip 10 Strips/Box	120
8	3	D17045	Tab. Nifedipine Sustained Release (SR) (Aluminium foil/Blister pack)	IP	10mg/Tab.	10 Tabs/Strip 10 Strips/Box	120
9	4	D17042	Tab. Labetalol (Aluminium foil/Blister pack)		100mg/Tab.	10 Tabs/Strip 10 Strips/Box	120
10	5	D17043	Inj. Labetalol		20mg/4ml Amp.	4 ml/Amp 20 Amps/Box	10
11	6	D26006	Inj. Magnesium Sulphate		500 mg/ml	2 ml/Amp 20 Amps/Box	70
12	7	D07004	Tab. Phenytoin Sodium (Aluminium foil/Blister pack)	IP	100 mg/Tab	10 Tabs/Strip 10 Strips/Box	
13	8	D07010	Inj. Lorazepam	IP	1 mg/ml	2 ml/Amp 20 Amps/Box	
14	9	D07006	Inj. Diazepam	IP	5mg/ml	2ml/Amp 20 Amps/Box	
15	10	D26010	Inj. Magnesium Sulphate		250 mg/ml	2 ml/Amp 20 Amps/Box	8
Pre-term labour & PROM							
16	1	D17044	Cap. Nifedipine (Soft gelatin capsule) (Aluminium foil/Blister pack)	IP	10 mg/Cap	10 Caps/Strip 10 Strips/Box	240
17	2	D26011	Inj. Isoxsuprine HCl		5mg / ml	2 ml/Amp 20 Amps/Box	15
18	3	D26004	Tab. Isoxsuprine (Aluminium foil/Blister pack)	IP	10 mg/Tab	10 Tabs/Strip 10 Strip/Box	84

Total Sl. No.	Sl No.	Drug Code	Name of the drug / item	Pharma Standard.	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
19	4	D05017	Inj. Betamethasone Sod. Phosphate	IP	4mg/ml	1 ml/Amp 20 Amps/Box	6
20	5	D09004	Inj. Ampicillin Sodium (with diluents in plastic container)	IP	Equivalent to 500 mg of anhydrous Ampicillin/Vial	500mg / Vial 20 Vials / Box	8
21	6	D09055	Cap. Ampicillin (Aluminium foil/Blister pack)	IP	500mg/Cap.	10 Caps/Strip 10 Strips/Box	15
22	7	D09102	Inj. Ampicillin Sodium (with diluents in plastic container)	IP	Equivalent to 1gm of anhydrous Ampicillin/Vial	1gm / Vial 20 Vials / Box	15
23	8	D09009	Inj. Gentamycin Sulphate	IP	40 mg/ml	2 ml/Vial 20 Vials/Box	10
24	9	D09098	Inj Cefotaxime+Sulbactam (with diluents in plastic container)		Cefotaxime 1gm + Sulbactam 0.5 gm / vial	1.5gm / Vial 20 Vials/Box	4
25	10	D09050	Cap. Amoxycillin Trihydrate (Aluminium foil/Blister pack)	IP	500 mg/Cap	10 Caps/Strip 10 Strips/Box	15
26	11	D09101	Inj. Amoxycillin Trihydrate (with diluents in plastic container)		500mg / vial	500mg / Vial 20 Vials / Box	
27	12	D13005	Tab. Metronidazole (Coated) (Aluminium foil/Blister pack)	IP	400 mg/Tab	10 Tabs/Strip 10 Strips/Box	10
28	13	D09016	Tab. Erythromycin Stearate (Equiv.to Erythromycin 250 mg)	IP	250 mg/Tab	10 Tabs/Strip 10 Strips/Box	
29	14	D09074	Tab. Erythromycin Esteolate (Equiv.to Erythromycin 500 mg)	IP	500 mg/Tab	10 Tabs/Strip 10 Strips/Box	
30	15	D09100	Tab. Nitrofurantoin (Aluminium foil/Blister pack)	IP	100 mg/Tab	10 Tabs/Strip 10 Strips/Box	45
Pregnancy with heart disease							
31	1	D17027	Tab. Digoxin (Aluminium foil/Blister pack)	IP	0.25 mg/Tab	10 Tabs/Strip 10 Strips/Box	280
32	2	D20001	Tab. Frusemide (Aluminium foil/Blister pack)	IP	40 mg/Tab	10 Tabs/Strip 10 Strips/Box	200
33	3	D20002	Inj. Frusemide	IP	10 mg/1 ml	2 ml/Amp 20 Amps/Box	10
Pregnancy with severe anaemia							
34	1	D16018	Inj Iron Sucrose	IP	50 mg/ 2.5 ml	5 ml/Amp 20 Amps/Box	12
35	2	D16009	Tab. Ferrous Sulphate + Folic Acid, (Sugar Coated) (Aluminium foil/Blister pack)	IP	Equivalent to 100 mg of Elemental Iron + Folic Acid 0.5mg	10 Tabs/Strip 10 Strips/Box	180
36	3	D08004	Tab. Albendazole (Chewable) (Aluminium foil/Blister pack)	IP	400mg/Tab.	1 Tab/Strip 10 Strips/Box	1

Total Sl. No.	Sl. No.	Drug Code	Name of the drug / item	Pharma Standard.	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
Intra Partum/Normal delivery							
37	1	D29003	I.V Compound Sodium Lactate (Ringer's Lactate) RL	IP	Lactic Acid- 0.24w/v equivalent to 0.32% w/v of sodium lactate sodium chloride- 0.6% w/v, potassium chloride-0.04% w/v, calcium chloride-0.027% w/v (FFS / BFS Plastic Container)	500 ml/Bottle 20 Bottles/Box	2
38	2	D29001	I.V Sodium Chloride (Normal Saline)	IP	0.9% w/v (FFS / BFS Plastic Container)	500 ml/Bottle 20 Bottles/Box	1
39	3	D29004	I.V Dextrose 5% (5D)	IP	5% w/v (FFS / BFS Plastic Container)	500 ml/Bottle 20 Bottles/Box	1
40	4	D29002	I.V Dextrose and Sodium Chloride (DNS)	IP	5% w/v Dextrose, 0.9% w/v Sodium Chloride (FFS, Plastic Container Automatic Continuous, Single Unit)	500 ml/Bottle 20 Bottles/Box	1
41	5	D29005	I.V Dextrose 10%(10D)	IP	10% w/v(FFS Plastic Container Automatic Continuous, Single Unit)	500 ml/Bottle 20 Bottles/Box	1
42	6	D29008	Inj. Sodium Bi-Carbonate	IP	7.5% w/v	10 ml/Amp 20 Amps/Box	2
43	7	D31001	Sterile Water For Injection (Plastic Container as per IP)	IP	5ml/Amp, (FFS Plastic Container Automatic Continuous Single Unit)	5 ml/Amp 20 Amps/Box	5
44	8	D04021	Inj. Tramadol HCl	BP	50 mg/ml	2 ml/Amp 20 Amps/Box	1
45	9	D26001	Inj. Methylergometrine Maleate	IP	0.2 mg/ml	1 ml/Amp 20 Amps/Box	1
46	10	D26007	Tab. Misoprostol (Aluminium Foil/Blister pack)		200mcg/Tab	10 Tabs/Strip 10 Strips/Box	4
47	11	D26002	Inj. Oxytocin	IP	5 IU/1ml	1ml/Amp 20 Amps/Box	6
48	12	D02001	Inj. Lignocaine HCl	IP	2% w/v	30 ml/Vial 20 Vials/Box	1
49	13	D26005	Inj. Carboprost Tromethamine	IP	250 mcg/ml	1 ml/Amp 20 Amp/Box	
50	14	D22009	Inj. Human Premixed Insulin (50/50, 30/70)	IP	Inj. 40 units/ml (Biphasic)	10 ml/Vial 20 Vials/Box	
51	15	D22002	Inj. Human Soluble Insulin		40 I.U/ml	10 ml/Vial 20 Vials/Box	
52	16	D22003	Tab. Metformin HCl (coated) (Aluminium foil/Blister pack)	IP	500 mg/Tab	10 Tabs/Strip 10 Strips/Box	

Total Sl. No.	Sl. No.	Drug Code	Name of the drug / item	Pharma Standard.	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
Consumables							
53	1	D34004	Absorbent Cotton	IP	Net Weight 500gms, Absorbency not more than 10 Seconds	500 gm/Packet (Net) 10 packets/Box	1
54	2	D18023	Povidone Iodine Lotion (Plastic container as per I.P.)	IP	5% w/v	100 ml/Bottle 20 Bottles/Box	1
55	3	D34007	Microporous Adhesive Paper Tape	-	2.5cm. x 10 yds (9.1 mtr) per roll with CE certification	10 Rolls / packet	1
56	4	S02002	Disposable Syringes	BIS	5 CC, with colour coded (as per BIS) needle Sterilised, Luer Mount, Non - toxic CGS 5CC as per Drugs & Cosmetics Act 1940, IS No. 12655	50 pieces in one box	4
57	5	S0204	Disposable Syringes	BIS	10 CC, with colour coded (as per BIS) needle Sterilised, Luer Mount, Non - toxic CGS 10CC as per Drugs & Cosmetics Act 1940, IS No. 12655	50 pieces in one box	4
58	6	S02003	Disposable sterilised Needles in blister pack		20 G - 24 G, IS No: 10654: 2002, ISO: 7864.1993 As Per Drugs & Cosmetics Act 1940	50 pieces in one box	4
59	7	S02011	Intravenous Set		Adult, With built in Airway moulded chamber and Needle, Sterile, Disposable, Non - Toxic, Non Pyrogenic, sterilised by ETO, 2.7 to 3.00 mm tube with fluid filter, non-kinkable tube, Length not less than 150 cms / I.S No. 12655 (part-4 of 2003), as per Drugs & Cosmetics Act- 1940	50 pieces in one box	1
60	8	S02008	Intra Cath		Adult, (two way) with closing Cover Type II Sterilised Size 18, 20,22 (Adult) with CE certification	50 pieces in one box	1
61	9	S01014	Catgut Chromic Atraumatic		Size: - 1-0, 1/2 Circle Round Bodied (40mm needle) U.S.P. with CE certification	12 Foils / Box	2
62	10	S02051	Umbilical cord clamp / Vascular clamp		Sterilised	Each	1
63	11	S02063	Infant mucous extractor		PVC, Non-Toxic, Sterilised, Pyrogen free, Disposable	Each	1

Total Sl. No.	SI No.	Drug Code	Name of the drug / item	Pharma Standard.	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
64	12	D34020	Medicated Soap (Dettol / Lifebuoy)		35 - 40 gm / soap	Each	1
65	13	S02106	K-90 plain Catheter				1
66	14	S02040	Operation Gloves	BIS	6", 6 1/2", 7", 7 1/2", Sterilised, Pre-powdered, BIS specifications gloves, surgical rubber made of Hypoallergic latex. 100% electronically tested, sterilised by Gamma Radiation / ETO, ISI Marked, IS No. 13422-92 with CE certification	Pair	5
67	15	S02049	Disposable Examination Gloves	BIS	6", 6 1/2", 7", 7 1/2", Sterilised, small, medium & large, pre-powdered, with CE certified, surgical rubber made of Hypoallergic latex. 100% electronically tested, sterilised by Gamma Radiation / ETO, White coloured. Min. length-240mm	Pair	4
68	16	D34008	Roller Bandage	BIS	4 mt. x 6 cm, IS-863-1988, Ends (column)-150, Picks (Row)-85/10 Sq. c.m	10 Rolls / packet	1

Postnatal Period

69	1	D09026	Tab. Cefadroxil (Aluminium foil/Blister pack)	IP	500 mg/Tab	10 Tabs/Strip 10 Strips/Box	10
70	2	D09050	Cap. Amoxycillin Trihydrate (Aluminium foil/Blister pack)	IP	500 mg/Cap	10 Caps/Strip 10 Strips/Box	30
71	3	D16009	Tab. Ferrous Sulphate + Folic Acid (Sugar Coated) (Aluminium foil/Blister pack)	IP	Equivalent to 100 mg of Elemental Iron + Folic Acid 0.5mg	10 Tabs/Strip 10 Strips/Box	90
72	4	D04002	Tab. Paracetamol (Aluminium foil/Blister pack)	IP	500 mg/Tab	10 Tabs/Strip 10 Strips/Box	10
73	5	D04006	Tab. Ibuprofen (Coated) (Aluminium foil/Blister pack)	IP	400 mg/Tab	10 Tabs/Strip 10 Strips/Box	10
74	6	D21010	Tab. Domperidone (Aluminium foil/Blister pack)	BP	10 mg/Tab	10 Tabs/Strip 10 Strips/Box	10
75	7	D23011	Inj. Human Anti-D Immunoglobulin *		300mcg/1.5ml	1.5 ml/Amp 20 Amps/Box	1 *
76	8	S02090	Sanitary Napkins			10 Nos. / Pkt.	2
77	9	D18024	Povidone Iodine Oint.	USP	5% w/v	15 gm/Tube 20 Tubes/Box	1
78	10	D21011	Tab. Dicyclomine HCL	IP	20 mg/Tab	10 Tabs/Strip 10 Strips/Box	10
79	11	D21013	Inj. Dicyclomine HCl	USP	10 mg/ml	2 ml/Amp 20 Amps/Box	2

* Rh -ve is around 5% of the total deliveries.

Total Sl. No.	Sl No.	Drug Code	Name of the drug / item	Pharma Standard.	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
Intra-partum- C- Section							
80	1	D13003	Inj. Metronidazole I.V	IP	500 mg/100 ml Bottle (FFS / BFS Plastic Container)	100 ml/Bottle 20 Bottles/Box	9
81	2	D09054	Inj. Cefotaxime Sodium (with diluents in plastic container)	IP	1gm/Vial	1gm/Vial 20 Vials/Box	6
82	3	D26002	Inj. Oxytocin	IP	5 IU/1ml	1ml/Amp 20 Amps/Box	14
83	4	D02008	Inj. Bupivacaine (Heavy)	IP	0.5% w/v	4 ml/Amp 20 Amps/Box	1
84	5	D02006	Inj. Bupivacaine	IP	5mg/ml	20 ml/Vial 20 Vials/Box	1
85	6	D02005	Inj. Lignocaine HCl and Dextrose (Heavy)	IP	Lignocaine HCl - 53.3 mg / ml + Dextrose 75mg / ml	2 ml/Amp 20 Amps/Box	1
86	7	D02003	Inj. Lignocaine HCl and Adrenaline Bitartrate	IP	Lignocaine HCl - 21.3 mg / ml + Adrenaline 0.5 mg / ml	30 ml/Vial 20 Vials/Box	1
87	8	D02001	Inj. Lignocaine HCl	IP	2% w/v	30 ml/Vial 20 Vials/Box	1
88	9	D21005	Inj. Promethazine HCl	IP	25 mg/ml	2 ml/Amp 20 Amps/Box	4
89	10	D04010	Inj. Diclofenac Sodium	IP	25 mg/ml	3 ml/Amp 20 Amps/Box	3
90	11	D04033	Inj. Paracetamol I.V		1000mg/100ml	100 ml/Bottle 20 Bottles/Box	3 - 4
91	12	D04021	Inj. Tramadol HCl	BP	50 mg/ml	2 ml/Amp 20 Amps/Box	3
92	13	D21030	Inj. Pantoprazole		40mg/vial	40mg/Vial 20 Vials/Box	1
93	14	D29003	I.V Compound Sodium Lactate (Ringer's Lactate) RL	IP	Lactic Acid-0.24w/v equivalent to 0.32% w/v of sodium lactate sodium chloride- 0.6% w/v, potassium chloride-0.04% w/v, calcium chloride- 0.027% w/v (FFS / BFS Plastic Container)	500 ml/Bottle 20 Bottles/Box	4
94	15	D29001	I.V Sodium Chloride (Normal Saline)	IP	0.9% w/v (FFS / BFS Plastic Container)	500 ml/Bottle 20 Bottles/Box	2
95	16	D29004	I.V Dextrose 5% (5D)	IP	5% w/v (FFS / BFS Plastic Container)	500 ml/Bottle 20 Bottles/Box	4
96	17	D29010	Plasmaexpander Infusion Polygeline	IP	Polymer from degraded gelatin 3.5gm colloidal (polygeline) (Na 145, K 5.1, Cal 12.5, Cl 145, mmol) in 100ml (FFS / BFS Plastic Container)	500 ml/Bottle 20 Bottles/Box	1
97	18	D04008	Inj. Pentazocine Lactate	IP	30 mg/ml (equivalent of 30 mg of pentazocine) /ml	1ml/Amp 20 Amps/Box	4
98	19	D21023	Inj. Ondensatron		2 mg/ml	2ml/Amp 20 Amps/Box	1
99	20	D26005	Inj. Carboprost Tromethamine	IP	250 mcg/ml	1 ml/Amp 20 Amp/Box	1

Total Sl. No.	Sl No.	Drug Code	Name of the drug / item	Pharma Standard	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
Consumables							
100	1	D34004	Absorbent Cotton	IP	Net Weight 500gms, Absorbency not more than 10 Seconds	500 gm/Packet (Net) 10 packets/Box	1
101	2	D18023	Povidone Iodine Lotion (Plastic container as per I.P.)	IP	5% w/v	100 ml/Bottle 20 Bottles/Box	1
102	3	D34007	Microporous Adhesive Paper Tape	-	2.5cm. x 10 yds (9.1 mtr) per roll with CE certification	10 Rolls / packet	1
103	4	S02002	Disposable Syringes	BIS	5 CC, with colour coded (as per BIS) needle Sterilised, Luer Mount, Non - toxic CGS 5CC as per Drugs & Cosmetics Act 1940, IS No. 12655 with CE certification	50 pieces in one box	10
104	5	S02001	Disposable Syringes		2 CC, With colour coded (as per BIS) needle Sterilised, Luer Mount, Non - toxic CGS 2CC as per Drugs & Cosmetics Act 1940, IS No. 12655 with CE certification	50 pieces in one box	5
105	6	S02043	Disposable Syringes	BIS	10 CC, with colour coded (as per BIS) needle Sterilised, Luer Mount, Non - toxic CGS 10CC as per Drugs & Cosmetics Act 1940, IS No. 12655 with CE certification	50 pieces in one box	5
106	7	S02094	Disposable Syringes	BIS	20 CC, with colour coded (as per BIS) needle Sterilised, Luer Mount, Non - toxic CGS 10CC as per Drugs & Cosmetics Act 1940, IS No. 12655 with CE certification	50 pieces in one box	1
107	8	S02003	Disposable sterilised Needles in blister pack		20 G - 24 G, IS No: 10654: 2002, ISO: 7864.1993 As Per Drugs & Cosmetics Act 1940	50 pieces in one box	10
108	9	S02024	Foley's Urinary Catheter		Size: 16F, Silkolatex (Pre - sterile) 2 way sterile, Non - toxic	Each	1

Total Sl. No.	Sl No.	Drug Code	Name of the drug / item	Pharma Standard	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
109	10	S02011	Intravenous Set		Adult, With built in Airway moulded chamber and Needle, Sterile, Disposable, Non - Toxic, Non Pyrogenic, sterilised by ETO, 2.7 to 3.00 mm tube with fluid filter, non-kinkable tube, Length not less than 150 cms / I.S No. 12655 (part-4 of 2003), as per Drugs & Cosmetics Act-1940 with CE certification	50 pieces in one box	1
110	11	S02008	Intra Cath		Adult, (two way) with closing Cover Type II Sterilised Size 18, 20 (Adult) with CE certification	50 pieces in one box	1
111	12	S01014	Catgut Chromic Atraumatic	USP	Size: - 1-0, 1/2 Circle Round Bodied (40mm needle) with CE certification	12 Foils / Box	2
112	13	S01013	Catgut Chromic Atraumatic	USP	Size: - 1, 1/2 Circle Round Bodied (40mm needle) (Heavy) with CE certification	12 Foils / Box	2
113	14	S01018	Polyglactin (Braided Coated) - 910	USP	Size: - 1, 1/2 Circle Round Bodied 40mm (Heavy needle) with CE certification	12 Foils / Box	1
114	15	S01083	Monofilament Polyamide Black Breaded Silk	USP	Size: - 2-0, 3/8 Circle Bodied 45mm needle, reverse cutting with CE certification	12 Foils / Box	1
115	16	S02051	Umbilical cord clamp / Vascular clamp		Sterilised	Each	1
116	17	S02091	Suction Tube			Each	1
117	18	S02092	Spinal Needle Disposable Adult as per BIS		23 / 25G (70 - 90mm) without hub	Each	1
118	19	D34020	Medicated Soap (Dettol / Lifebuoy)		35 - 40 gm / soap	Each	1
119	20	S02026	Urinary Drainage Bag		Sterilised with non return valve and Drainage outlet with a capacity of 2000ml , with marking non toxic pyrogen free, double seek , clinical grade PVC will be preferred	Each	1
120	21	D34008	Roller Bandage	BIS	4 mt. x 6 cm, IS-863-1988, Ends (column)-150, Picks (Row)-85/10 Sq. c.m	10 Rolls / packet	1

Total Sl. No.	Sl No.	Drug Code	Name of the drug / item	Pharma Standard	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
121	22	D34021	Absorbent Gauze	Sch.F(II) of D&C Act	Min. Mass: 30±5gm /sq.mtr Confirming to IS: 758/1988 Ends(Column)-75, Picks(Row)-55 / 10Sq.cm, Absorbency not more than 10seconds	1 mtr x 60 cm per than 10 Thans/Packet	1
122	23	D19014	Surgical Spirit (Plastic Container as per IP)	BP00 ml/Bottle		20 Bottles/Box	1
123	24	S02063	Infant mucous extractor		PVC, Non-Toxic, Sterilised, Pyrogen free, Disposable	Each	1
124	25	S02018	Surgicals Blades (Sterilised)		Pre - sterile with Gamma radiation for handle no. 4 sizes, 22, 24 ISI : 3319:1995	50 pieces in one box	1
125	26	S02093	Surgiwear			Each	1
Miscellaneous Drugs (may be required in some cases of C- Section)							
126	1	S02107	Epidural Set		Epidurarl Syringe - 1, Epidural Needle - 18G - 1, Epidural Catheter - 1	Each	1
127	2	D09078	Inj. Cefoperazone & Sulbactam (with diluents in plastic container)		500mg Cefoperazone + 500mg Sulbactam	1gm/Vial 20 Vials/Box	6
128	3	D09054	Inj. Cefotaxime Sodium (with diluents in plastic container)	IP	1gm/Vial	1gm/Vial 20 Vials/Box	6
129	4	D05005	Inj. Adrenaline Bitartrate	IP	1mg/ml (1: 1000)	1ml/Amp 20 Amps/Box	1
130	5	D20002	Inj. Frusemide	IP	10 mg/1 ml	2 ml/Amp 20 Amps/Box	10
131	6	D05018	Inj. Noradrenaline		2mg/ml	2ml/Amp 20 Amps/Box	1
132	7	D03001	Inj. Atropine Sulphate	IP	0.6 mg/ml	1 ml/Amp 20 Amps/Box	4
133	8	D17013	Inj. Dopamine HCl (Intravenous Infusion)	BP	40 mg/ml	5 ml/Amp 20 Amps/Box	1
134	9	D17040	Inj Dobutamine		50 mg/ml	5ml / Vial 20 Vials/Box	1
135	10	D05002	Inj. Hydrocortisone Sodium Succinate (with diluents in plastic container)	IP	100 mg of hydrocortisone/Vial	2 ml/Vial 20 Vials/Box	
136	11	D01005	Halothane	BP	30 ml/Bottle	30 ml/Bottle 20 Bottles/Box	1
137	12	D01002	Inj. Thiopentone Sodium	IP	500 mg/Vial	500 mg/Vial 20 Vials/Box	1

Total Sl. No.	Sl No.	Drug Code	Name of the drug / item	Pharma Standard	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
138	13	D24005	Inj. Vecuronium Bromide	BP	4mg/2ml	2 ml/Vial 20 Vials/Box	2
139	14	D24006	Inj. Neostigmine Methylsulphate	IP	0.5 mg/ml	1ml/Amp 20 Amps/Box	5
140	15	D24003	Inj. Succinyl Choline Chloride	IP	50 mg/ml	2 ml/Vial 20 Vials/Box	1
141	16	D03002	Inj. Glycopyrrolate	USP	0.2 mg/ml	1 ml/Amp 20 Amps/Box	4
142	17	D01008	Inj. Atracurium Besylate	EP	10 mg/ml	2.5 ml/Amp 20 Amps/Box	2
143	18	D01001	Inj. Ketamine HCl	IP	57.7 mg of Ketamine HCl Equivalent to 50 mg of Ketamine	10 ml/Vial 20 Vials/Box	1
144	19	D17047	Inj. Ephedrine HCl		30 mg/ml	1ml/Amp 20 Amps/Box	2
145	20	D07006	Inj. Diazepam	IP	5mg/ml	2ml/Amp 20 Amps/Box	1
146	21	D01007	Inj. Midazolam	BP	1 mg/ml	10 ml/Vial 20 Amps/Box	1
147	22	D05001	Inj. Dexamethasone Sodium Phosphate	IP	4 mg/ml (4.4 mg of Dexamethasone sodium phosphate is equivalent to 4 mg. of Dexamethasone Phosphate)	2 ml/Vial 20 Vials/Box	1
148	23	D28001	Inj. Theophylline & Etophylline	IP	Theophylline 50.6 mg + Etophylline 169.4 mg/2ml	2 ml/Amp 20 Amps/Box	2
Postnatal Period C- section							
149	1	D09077	Tab. Azithromycin (Aluminium Foil/Blister pack)	IP	500 mg/Tab	3 Tabs/Strip 10 Strips/Box	6
150	2	D09091	Tab. Cefixime (Aluminium Foil/Blister pack)	IP	200mg/Tab	10 Tabs/Strip 10 Strips/Box	10
151	3	D09050	Cap. Amoxycillin Trihydrate (Aluminium foil/Blister pack)	IP	500 mg/Cap	10 Caps/Strip 10 Strips/Box	15
152	4	D16009	Tab. Ferrous Sulphate + Folic Acid (Sugar Coated) (Aluminium foil/Blister pack)	IP	Equivalent to 100 mg of Elemental Iron + Folic Acid 0.5mg	10 Tabs/Strip 10 Strips/Box	90
153	5	D04002	Tab. Paracetamol (Aluminium foil/Blister pack)	IP	500 mg/Tab	10 Tabs/Strip 10 Strips/Box	10
154	6	D04006	Tab. Ibuprofen (Coated) (Aluminium foil/Blister pack)	IP	400 mg/Tab	10 Tabs/Strip 10 Strips/Box	10
155	7	D21010	Tab. Domperidone (Aluminium foil/Blister pack)	BP	10 mg/Tab	10 Tabs/Strip 10 Strips/Box	10
156	8	D23011	Inj. Human Anti-D Immunoglobulin *		300mcg/1.5ml	1.5 ml/Amp 20 Amps/Box	1*

* Rh -ve is around 5% of the total deliveries.

Total Sl. No.	Sl No.	Drug Code	Name of the drug / item	Pharma Standard	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
157	9	S02090	Sanitary Napkins			10 Nos. / Pkt	2
158	10	D18024	Povidone Iodine Oint.	USP	5% w/v	15 gm/Tube 20 Tubes/Box	1

Intra Partum eclampsia

159	1	D29003	I.V Compound Sodium Lactate (Ringer's Lactate) RL	IP	Lactic Acid- 0.24w/v equivalent to 0.32% w/v of sodium lactate sodium chloride- 0.6% w/v, potassium chloride-0.04% w/v, calcium chloride-0.027% w/v (FFS / BFS Plastic Container)	500 ml/Bottle 20 Bottles/Box	2
160	2	D29004	I.V Dextrose 5% (5D)	IP	5% w/v (FFS / BFS Plastic Container)	500 ml/Bottle 20 Bottles/Box	10
161	3	D29005	I.V Dextrose 10%(10D)	IP	10% w/v(FFS Plastic Container Automatic Continuous, Single Unit)	500 ml/Bottle 20 Bottles/Box	
162	4	D29008	Inj. Sodium Bi-Carbonate	IP	7.5% w/v	10 ml/Amp 20 Amps/Box	2
163	5	D31001	Sterile Water For Injection (Plastic Container as per IP)	IP	5ml/Amp,(FFS Plastic Container Automatic Continuous Single Unit)	5 ml/Amp 20 Amps/Box	10
164	6	D04021	Inj. Tramadol HCl	BP	50 mg/ml	2 ml/Amp 20 Amps/Box	1
165	7	D26006	Inj. Magnesium Sulphate		500 mg/ml	2 ml/Amp 20 Amps/Box	70
166	8	D26010	Inj. Magnesium Sulphate		250 mg/ml	2 ml/Amp 20 Amps/Box	8
167	9	D07007	Inj. Phenytoin Sodium	IP	50 mg/ml	2 ml/Amp 20 Amps/Box	1
168	10	D07002	Inj. Phenobarbitone Sodium	IP	200 mg/ml	1ml/Amp 20 Amps/Box	1
169	11	D29013	Inj. Calcium Gluconate		10% w/v	10ml/Amp 20 Amps/Box	2
170	12	D26002	Inj. Oxytocin	IP	5 IU/1ml	1ml/Amp 20 Amps/Box	10
171	13	D02001	Inj. Lignocaine HCl	IP	2% w/v	30 ml/Vial 20 Vials/Box	1

Consumables

172	1	D34004	Absorbent Cotton	IP	Net Weight 500gms, Absorbency not more than 10 Seconds	500 gm/Packet (Net) 10 packets/Box	1
173	2	D18023	Povidone Iodine Lotion (Plastic container as per I.P)	IP	5% w/v	100 ml/Bottle 20 Bottles/Box	1

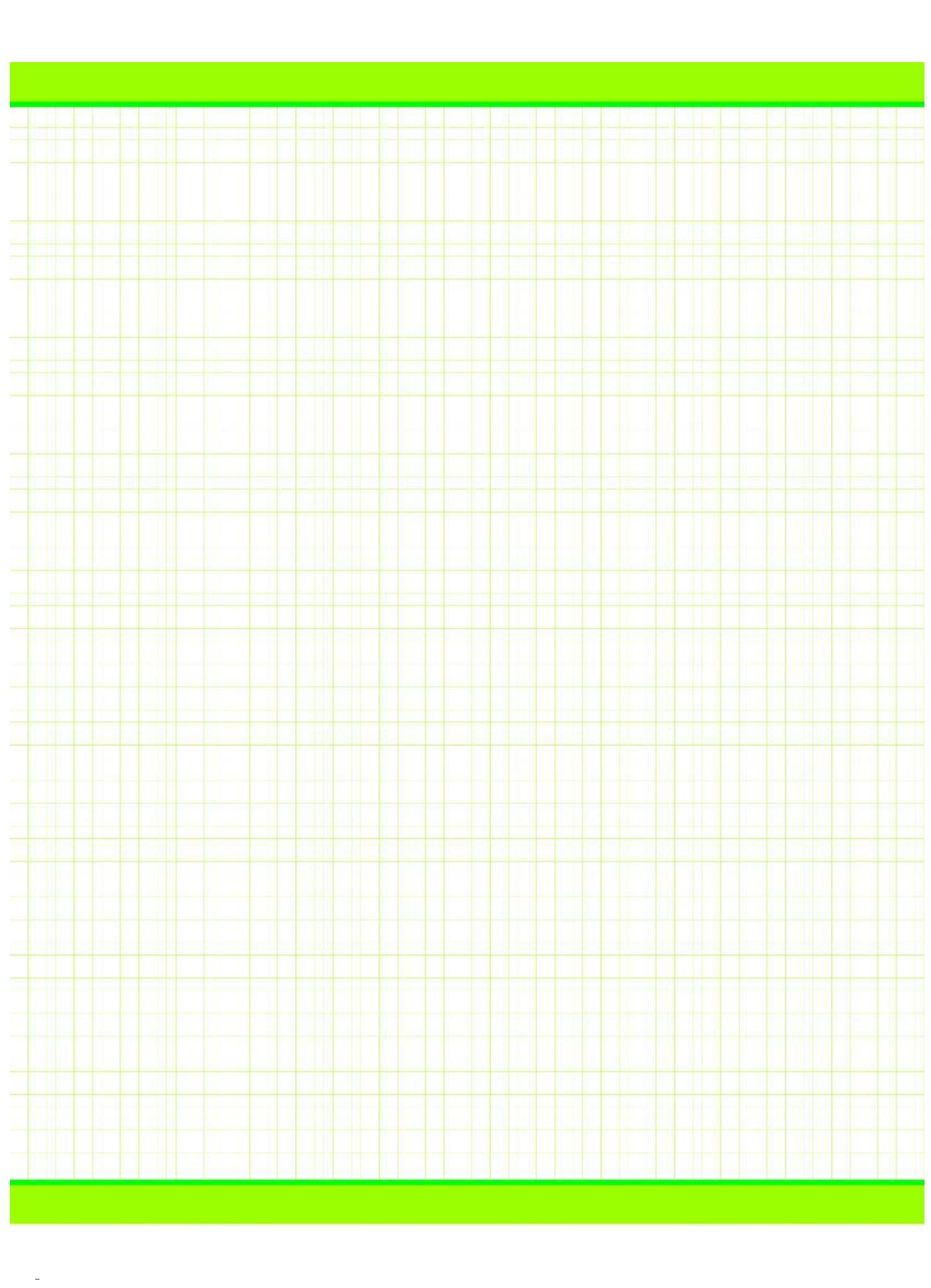
Total Sl. No.	Sl No.	Drug Code	Name of the drug / item	Pharma Standard	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
174	3	D34007	Microporus Adhesive Paper Tape	-	2.5cm. x 10 yds (9.1 mtr) per roll with CE certification	10 Rolls / packet	1
175	4	S02002	Disposable Syringes	BIS	5 CC, with colour coded (as per BIS) needle Sterilised, Luer Mount, Non - toxic CGS 5CC as per Drugs & Cosmetics Act 1940, IS No. 12655 with CE certification	50 pieces in one box	10
176	5	S02043	Disposable Syringes	BIS	10 CC, with colour coded (as per BIS) needle Sterilised, Luer Mount, Non - toxic CGS 10CC as per Drugs & Cosmetics Act 1940, IS No. 12655 with CE certification	50 pieces in one box	16
177	6	S02094	Disposable Syringes	BIS	20 CC, with colour coded (as per BIS) needle Sterilised, Luer Mount, Non - toxic CGS 10CC as per Drugs & Cosmetics Act 1940, IS No. 12655 with CE certification	50 pieces in one box	1
178	7	S02003	Disposable sterilised Needles in blister pack		22 / 23 G , IS No: 10654: 2002, ISO: 7864.1993 As Per Drugs & Cosmetics Act 1940	50 pieces in one box	22 G - 17 23 G - 10
179	8	S02011	Intravenous Set		Adult, With built in Airway moulded chamber and Needle, Sterile, Disposable, Non - Toxic, Non Pyrogenic, sterilised by ETO, 2.7 to 3.00 mm tube with fluid filter, non-kinkable tube, Length not less than 150 cms / I.S No. 12655 (part-4 of 2003), as per Drugs & Cosmetics Act- 1940 with CE certification	50 pieces in one box	2
180	9	S02009	Intra Cath		Adult, (two way) with closing Cover Type II Sterilised Size 18, 20,22 (Adult) with CE certification	50 pieces in one box	2
181	10	S01014	Catgut Chromic Atraumatic		Size: - 1-0, 1/ 2 Circle Round Bodied (40mm needle) U.S.P, with CE certification	12 Foils / Box	4

Total Sl. No.	Sl No.	Drug Code	Name of the drug / item	Pharma Standard	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
182	11	S02051	Umbilical cord clamp / Vascular clamp		Sterilised	Each	1
183	12	S02091	Suction Tube				1
184	13	D34020	Medicated Soap (Dettol / Lifebuoy)		35 - 40 gm / soap	Each	1
185	14	S02106	K-90 plain Catheter				1
186	15	S02047	Operation Gloves	BIS	6", 6 1/2", 7", 7 1/2", Sterilised, Pre-powdered, BIS specifications gloves, surgical rubber made of Hypoallergic latex, 100% electronically tested, sterilised by Gamma Radiation / ETO, ISI Marked, IS No. 13422-92 with CE certification	Dozen Pair	5
187	16	S02049	Disposable Examination Gloves	BIS	6", 6 1/2", 7", 7 1/2", Sterilised, small, medium & large, pre-powdered, with CE certified, surgical rubber made of Hypoallergic latex, 100% electronically tested, sterilised by Gamma Radiation / ETO, White coloured. Min. length-240mm	Dozen Pair	8
188	17	D34008	Roller Bandage	BIS	4 mt. x 6 cm, IS-863-1988, Ends (column)-150, Picks (Row)-85/10 Sq. c.m	10 Rolls / packet	1
189	18	S02063	Infant mucous extractor		PVC, Non-Toxic, Sterilised, Pyrogen free, Disposable	Each	1

Postnatal Period / Eclampsia

190	1	D09026	Tab. Cefadroxil (Aluminium foil/Blister pack)	IP	500 mg/Tab	10 Tabs/Strip 10 Strips/Box	10
191	2	D09050	Cap. Amoxycillin Trihydrate (Aluminium foil/Blister pack)	IP	500 mg/Cap	10 Caps/Strip 10 Strips/Box	30
192	3	D16009	Tab. Ferrous Sulphate + Folic Acid (Sugar Coated) (Aluminium foil/Blister pack)	IP	Equivalent to 100 mg of Elemental Iron + Folic Acid 0.5mg	10 Tabs/Strip 10 Strips/Box	90
193	4	D04002	Tab. Paracetamol (Aluminium foil/Blister pack)	IP	500 mg/Tab	10 Tabs/Strip 10 Strips/Box	10
194	5	D04006	Tab. Ibuprofen (Coated) (Aluminium foil/Blister pack)	IP	400 mg/Tab	10 Tabs/Strip 10 Strips/Box	10

Total Sl. No.	Sl No.	Drug Code	Name of the drug / item	Pharma Standard	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
195	6	D21010	Tab. Domperidone (Aluminium foil/Blister pack)	BP	10 mg/Tab	10 Tabs/Strip 10 Strips/Box	10
196	7	S02090	Sanitary Napkins			10 Nos. / Pkt	2
197	8	D18024	Povidone Iodine Oint.	USP	5% w/v	15 gm/Tube 20 Tubes/Box	1
198	9	D27001	Tab. Diazepam (Aluminium foil/Blister pack)	IP	5 mg/Tab	10 Tabs/Strip 10 Strips/Box	10
199	10	D17045	Tab. Nifedipine SR (Aluminium foil/Blister pack)	IP	10mg/Tab.	10 Tabs/Strip 10 Strips/Box	20
200	11	D17042	Tab. Labetalol (Aluminium foil/Blister pack)		100mg/Tab.	10 Tabs/Strip 10 Strips/Box	40
201	12	D17004	Tab. Nifedipine (Aluminium foil/Blister pack)	IP	10mg/Tab.	10 Tabs/Strip 10 Strips/Box	20
Puerperal Sepsis							
202	1	D09102	Inj. Ampicillin Sodium (with diluents in plastic container)	IP	Equivalent to 1gm of anhydrous Ampicillin/Vial	1gm / Vial 20 Vials / Box	21
203	2	D09009	Inj. Gentamycin Sulphate	IP	40 mg/ml	2 ml/Vial 20 Vials/Box	14
204	3	D13003	Inj. Metronidazole I.V	IP	500 mg/100 ml Bottle (FFS / BFS Plastic Container)	100 ml/Bottle 20 Bottles/Box	21
N.B:	The requirements mentioned are approximate and commonly practised but may become more or less depending on individual cases.						



Standard Treatment Guideline & Essential Medicine List (For Sick Newborn)

ACKNOWLEDGEMENTS

The National Rural Health Mission, Health & F.W. Department, Government of Odisha acknowledge the contributions in preparation of the first Standard Treatment Guideline for Sick Newborn in the year 2011 – 2012.

- | | |
|------------------------------------|---|
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INTRODUCTION

Neonatal Mortality Rate (NMR) in India is 37 per 1000 live births which is 64% of infant deaths (SRS-2009). Orissa is having 47 NMR securing 2nd highest position in the country. Most of the neonates are dying due to Birth asphyxia, Prematurity and Sepsis. It is well known that majority of neonatal deaths can be prevented with low cost and low technology intervention. For that all the pillars of the health care system have to be strengthened. These are care at home and care at Facility. Proper care at home is possible by counseling on KMC, Breast Feeding, Maintenance of personal hygiene and identification of danger signs. ANM, AWW and ASHA are playing key role for community care.

Facility based care encompasses care at peripheral health posts such as Sub centre, PHC, CHC, FRU and DHH. It has been estimated that optimal treatment of neonatal illnesses can avert up to half of all preventable neonatal deaths. Now with help of NRHM these facilities are being strengthened with infrastructure, logistics and manpower. But there is variation in treatment of sick newborns from one facility to another. Keeping this in view a standard treatment guideline for common neonatal conditions has been prepared. This module will help the medical and paramedical personnel working in different health institutions of Orissa in managing sick newborns.

1. CARE OF THE NORMAL NEWBORN

Assessment –

Assess the baby for respiration, heart rate, colour and muscle tone.

If there is no abnormality take following care

Routine Care-

- ❖ Dry the baby
- ❖ Cut the cord within 1-3 minutes
- ❖ Wipe the eyes with clean cotton swab soaked with normal saline.
- ❖ Initiate breast-feeding as soon as possible.
- ❖ Weigh the baby and keep the baby warm.
- ❖ Administer injection vitamin K 1 mg (> 1000 mcg) or 0.5 mg (< 1000 mcg)
- ❖ Eye drop if required

Normal Physiological Condition of Newborn

- ❖ Mastitis Neonatorum-Engorgement of breasts occurs in term babies on 3rd and 4th day and disappears by end of 1st week.
- ❖ Vaginal Bleeding-Occurs on 3rd and 4th days of life in female babies. No additional Vit. K required. Disappears by end of 1st week.
- ❖ Peeling of Skin – Dry skin with peeling of skin.
- ❖ Non retractable Prepuce
- ❖ Erythema Neonatorum – Rash with central Pallor appears on 2nd -3rd day on face trunk and extremities and disappears spontaneously after 2 to 3 days.
- ❖ Epstein Pearls:- These are white spots usually on either side of the median raphe of the hard palate. Similar lesion may be seen on prepuce. These are of no significance.

Major Congenital Anomalies

- ❖ Imperforate anus
- ❖ Tracheo oesophageal fistula
- ❖ Cleft lip and palate
- ❖ Diaphragmatic hernia
- ❖ Any midline Swelling
- ❖ Single umbilical artery

2. NEONATAL RESUSCITATION

Required for:

- ❖ Apnoea or Gasping
- ❖ Preterm
- ❖ Meconium stained non vigorous baby
- ❖ Poor Muscle tone

Management:

Follow the flow chart in annexure

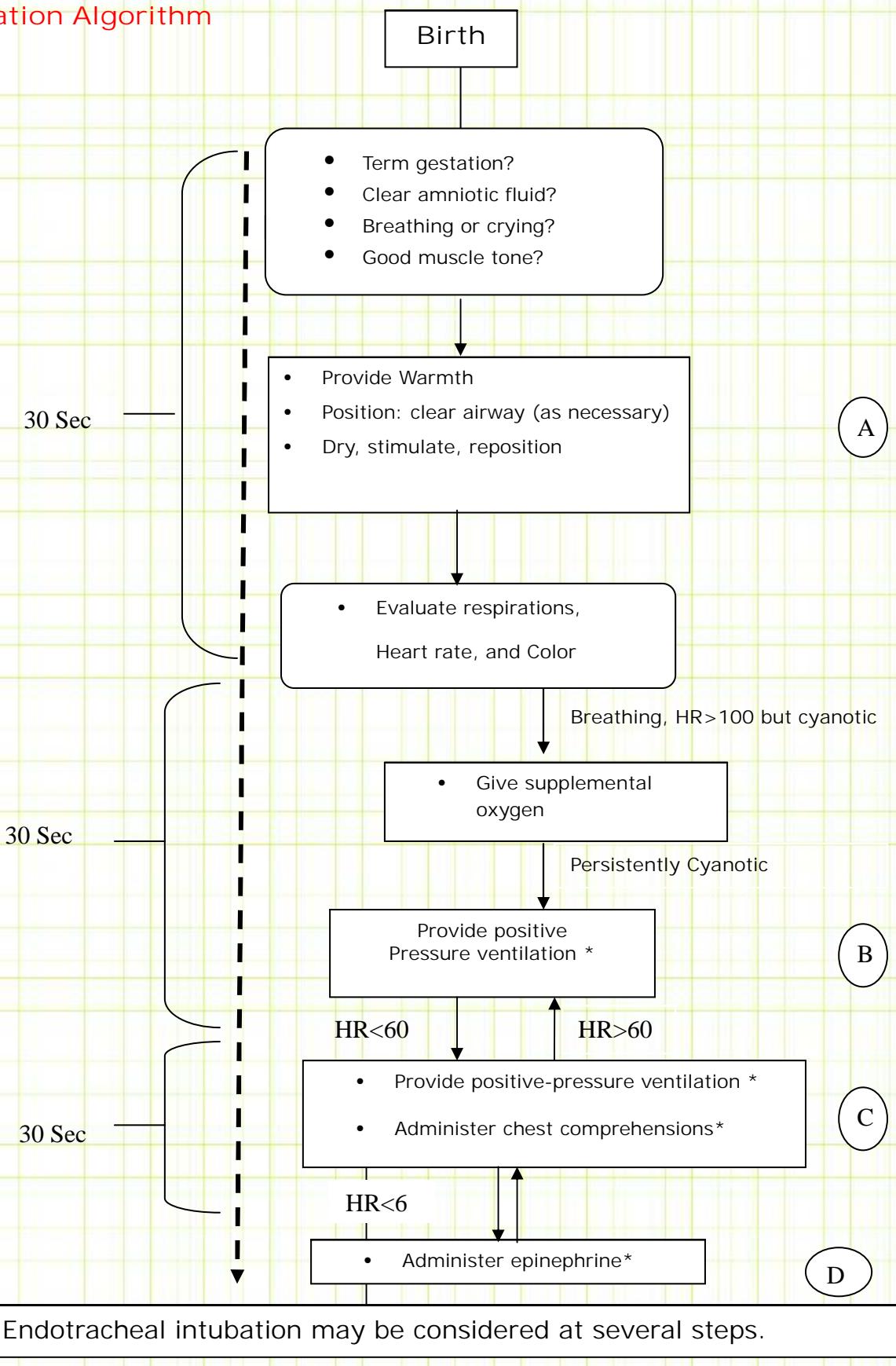
(A) Non – Drugs:-

- ❖ Keep room warm 26°C - 28°C
- ❖ Keep baby under radiant warmer (36.5°C – 37.4°C)
- ❖ Suctioning of mouth followed by nose (if necessary)
- ❖ Dry the baby
- ❖ Stimulation by gently rubbing the back or flicking the sole.
- ❖ Bag & Mask ventilation (if necessary)

. (B) Drugs:-

- ❖ Oxygen inhalation
- ❖ Inj. adrenaline 0.1 – 0.3 ml /kg (1: 10000) IV
- ❖ Normal saline 10ml / kg IV over 5-10 minutes may be repeated if no improvement within 30 minutes.

Resuscitation Algorithm



3. HYPOTHERMIA

Heat loss occurs by 4 methods (evaporation, convection, conduction & radiation)

Clinical Features:-

- ❖ Lethargy
- ❖ Grading of hypothermia
 - Normal temp : 36.5 – 37.4°C
 - Cold stress : 36.4 – 36 °C
 - Moderate hypothermia : 35.9 – 32 °C
 - Severe hypothermia : < 32°C

Investigation:-

- ❖ Blood glucose
- ❖ Septic screen

Management of Hypothermia

- ❖ Record the actual body temperature.
- ❖ Re-warm a hypothermic baby as quickly as possible:
- ❖ Severe hypothermia – Radiant warmer
- ❖ Mild to Moderate hypothermia- Kangaroo Mother Care or Radiant Warmer
Infection should be suspected, if despite taking above measure hypothermia Still persists.

Management of severe Hypothermia

1. Keep under radiant warmer
2. Reduce further heat loss
3. Infuse IV 10% Dextrose @ 2ml / kg followed by maintenance
4. Inject vitamin K 1.0 mg Intra Muscular
5. Provide Oxygen
6. Consider and access for sepsis

Prevent Hypothermia : Warm chain

Baby must kept warm at all times right from birth. The “ warm chain” is a set of ten interlinked procedures Carried out at birth and later.

1. Warm delivery room (25°C – 28°C)
2. Warm resuscitation
3. Immediate drying
4. Skin-to-skin contact between baby and the mother
5. Breastfeeding
6. Bathing to be postponed
7. Appropriate clothing and bedding
8. Mother and baby together
9. Warm transportation
10. Training / awareness of healthcare provider.

4. HYPOGLYCEMIA

Definition:

Hypoglycemia in newborn is defined as blood glucose < 45 mg / dl Commonly seen in premature, IMCGR, Infants of diabetic mother and babies resuscitated in labour room.

Clinical Feature:

- Lethargy, poor cry, poor suck, hypothermia, apnoea, cyanosis, jitteriness, convulsion, hypotonia

Investigation:

- ❖ RBS (Random Blood Sugar)

Management of Hypoglycemia

Hypoglycemia in newborn is defined as blood glucose levels less than 45 mg/dl

Management of Hypoglycemia

- ❖ Establishment an IV line, infuse a bolus of 2 ml/ kg body weight of 10% glucose slowly over 5 minutes.
 - If baby has convulsion, give bolus of 4-5ml/ kg of 10% glucose.
 - If IV line not available, administer 2 ml/ kg of 10% glucose by gastric tube.
- ❖ Start infusion of dextrose at the daily maintenance volume to provide at the rate of 6 mg / kg / min.
- ❖ Measure blood glucose after 30 minutes and then every four to six hours.
- ❖ If blood glucose <25 mg / dl:
 - Repeat bolus of glucose as above
 - Increase to infusion rate of 8 mg / kg / min.
- ❖ If the blood glucose > 25 mg / dl / but <45 mg / dl:
 - Increase infusion rate by 2 mg / kg / min.
 - Measure blood glucose after 30 minutes.
 - Continue the infusion at this rate until 2 consecutive values 6 hrs apart are above 45 mg / dl.
- ❖ Begin breastfeeding as soon as baby is able to breastfeed.
 - If cannot be breastfeed, give EBM by Spoon or paladai.
 - As feeling improves, slowly decrease (over 1-2 days) IV glucose and increase oral feeds.

Don't discontinue the glucose infusion abruptly to prevent rebound hypoglycemia.

Achieving appropriate glucose infusion rates using a mixture of D10 & D25.

Volume (ml/ kg/ dl)	Volume required (ml / kg/ dl)								
	Glucose Infusion Rate								
	6 mg / kg/ min			8 mg / kg/ min			10 mg / kg/ min		
	D10 (ml / kg/ dl)	D25 (ml / kg/ dl)	DW	D10 (ml/ kg/ dl)	D25 (ml / kg/ dl)	DW	D10 (ml / kg/ dl)	D25 (ml / kg/ dl)	DW
60	42	18	-	24	36	-	5	55	-
75	68	7	-	49	26	-	30	45	-
90	86	-	4	74	16	-	55	35	-
105	85	-	20	99	6	-	80	25	-
120	86	-	34	114	-	6	97	18	-
135	86	-	49	114	-	21	130	5	-
150	86	-	64	114	-	36	143	-	7

5. NEONATAL SEPSIS

Neonatal Sepsis is one of the major causes of neonatal mortality. Sepsis is largely preventable.

Clinical Features:-

- ❖ Lethargy
- ❖ Poor feeding / refusal to suck
- ❖ Poor cry
- ❖ Comatose
- ❖ Abdominal distension
- ❖ Diarrhea / vomiting
- ❖ Hypothermia
- ❖ Poor perfusion
- ❖ Shock
- ❖ Bleeding
- ❖ Sclerama
- ❖ Pneumonia – Fast breathing, Nasal flaring, Grunting, Chest in drawing
- ❖ Meningitis – Fever, High pitch cry, Vacant look, Seizure, Irritability, Bulging fontanelle, Neck retraction

Investigation:-

Sepsis Screening

Any two tests that come positive out of the following five tests strongly indicate presence of Sepsis:

1. Leukopenia (TLC <5000/cmm)
2. Neutropenia (ANC <1800/cmm)
3. Immature neutrophil to total neutrophil (I/T) ratio (>0.2)
4. Micro ESR (> 15mm 1st hour)
5. Positive CRP

In clinically Suspected cases of sepsis, send blood culture prior to starting antibiotics. .

- a. Blood culture
- b. Pus culture
- c. Urine culture
- d. CSF study

Management:-

- a. Non Drug:-
 - Provision of warmth
 - Maintain airway
 - Oxygen inhalation if required
 - Avoid enteral feeding if baby is hemo-dynamically compromised
- b. Drug:-
 - Antibiotic as per annex
 - 10% DS 2 ml / kg as bolus if hypoglycemia suspected
 - Inj vitamin K 1mg IM
 - Normal Saline 10ml / kg over 20-30 minutes if CFT more than 3sec. (repeat 2nd dose after 30 min if no improvement)
 - Inj. Dopamine if no improvement after two doses of Normal Saline (For Dopamine Dose Refer to Management of Sock)

- ❖ Start oxygen by hood or mask, if cyanosed or grunting.
- ❖ Provide gentle physical stimulation, if apnoeic. Provide bag and mask ventilation with oxygen if breathing is inadequate.
- ❖ Avoid enteral feed if hemodynamically compromised give maintenance IV fluids.
- ❖ Consider use of dopamine if perfusion is presently poor.
- ❖ Consider exchange transfusion if there is sclerema.

Do lumbar puncture if meningitis suspected clinically, if positive then treat for 21 days,

Antibiotics therapy for a newborn with sepsis:

Choice of antibiotics:

- ❖ Antibiotics therapy should cover the common causative bacteria, namely Escherichia coli, Staphylococcus aureus and Klebsiella pneumonia.
- ❖ A combination of ampicillin and gentamicin is recommended for treatment of sepsis and pneumonia.
- ❖ In suspected or confirmed meningitis, add cefotaxime with an aminoglycoside.
- Following table provides the antibiotics and dosages of antibiotics for newborn sepsis.

Antibiotics therapy of neonatal sepsis

I. Septicemia or pneumonia

Antibiotics	Each dose	Frequency		Route	Duration
		<7 days age	> 7 days age		
Inj Ampicillin or	50 mg/kg /dose	12 hrly	8 hrly	IV	7-10 days
Inj Cloxacillin	50 mg/kg /dose	12 hrly	8 hrly	IV	7-10 days
<u>AND</u>					
Inj Gentamicin or	5 mg/kg/dose	24 hrly	24 hrly	IV	7-10 days
Inj Amikacin	15 mg/kg/dose	24 hrly	24 hrly	IV	7-10 days

II. Meningitis

Antibiotics	Each dose	Frequency		Route	Duration
		<7 days age	>7 days age		
Inj Ampicillin and	100 mg/kg /dose	12 hrly	8 hrly	IV	3 weeks
Inj Gentamicin	2.5 mg/kg /dose	12 hrly	8 hrly	IV	3 weeks
<u>OR</u>					
Inj Cefotaxime or	50 mg/kg/dose	12 hrly	8 hrly	IV	3 weeks
Inj Gentamicin	2.5 mg/kg/dose	12 hrly	8 hrly	IV	3 weeks

Supportive care of a septic neonate

1. Provide warmth, ensure consistently normal temperature.
2. Start intravenous line.
3. Infuse normal saline 10 ml/kg over 20-30 minutes, if perfusion is poor as evidenced by Capillary Refill Time (CRT) of more than 3 seconds. Repeat the same dose 1-2 times over the next 30-45 minutes, if perfusion continues to be poor.
4. Infuse glucose (10 percent) 2ml/kg start.
5. Inject Vitamin K 1mg intramuscularly.

6. NEONATAL SEIZURE

Clinical Feature:-

1. Generalised or Focal, Tonic or Chronic
 - Repetitive jerking movements of limbs or face
 - Continuous extension or flexion of arms and legs
2. Subtle convulsions
 - Repetitive blinking, eye deviation or staring
 - Repetitive movements of mouth or tongue
 - Purposeless movement of the limbs, as if bicycling or swimming

Investigations-

- ❖ Blood sugar
- ❖ CBC, RDK, MP
- ❖ USG brain
- ❖ Serum Electrolytes
- ❖ CSF study, EEG
- ❖ CT/MRI

MANAGEMENT

- Identify and characterize the seizure
- Secure airway and optimize breathing, circulation and temperature
- Start O₂ if seizures continue
- Secure IV access and take samples for baseline investigations including sugar, hematocrit, sepsis screen and calcium, magnesium, electrolytes where feasible
- If blood sugar < 45 mg/dl, give 5 ml/kg 10% dextrose
- If seizures continue
- IV Phenobarbitone 20 mg/kg over 20 min
- If no control
- Repeat Phenobarbitone 10 mg/kg till a total of 40 mg/kg
- If seizures continue
- Give Phenytoin 20 mg/kg over 20 min → **If seizure persists consider Lorazepam**
- After control of seizures initiate maintenance doses.

7. BIRTH ASPHYXIA

Clinical Features:

- ❖ Delayed/Absent cry after birth
- ❖ Convulsion
- ❖ Apnoea/Irregular breathing
- ❖ Hypotonia
- ❖ Loss of Reflexes
- ❖ Coma

Investigation:-

- ❖ Serum Electrolytes/glucose
- ❖ Sepsis Screening
- ❖ CBC
- ❖ Serum Urea Creatinine
- ❖ USG/CT of Brain

MANAGEMENT

Non Drug:

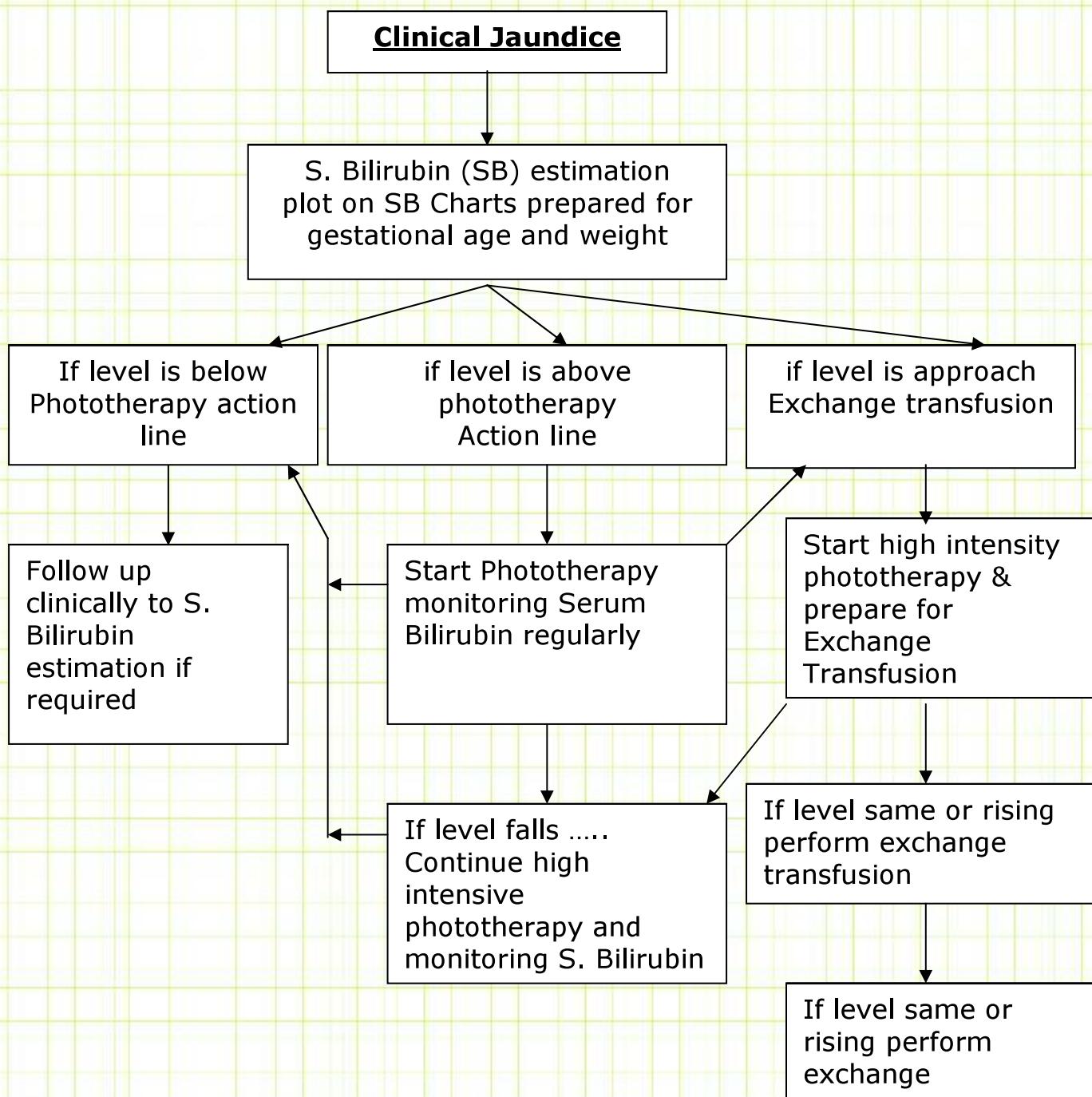
- Warmth,
- O₂ inhalation,
- Suction

Drug-

- Treat Hypoglycemia
- Inj Calcium Gluconate
- Anti Convulsant drugs-

- ◆ Inj Phenobarbitone 20mg/kg loading dose IV after diluting with Normal Saline over 15-20 minutes followed by maintenance dose of 5 mg/kg /day in two divided doses.
- ◆ If not controlled repeat the dose 10mg /kg at interval of 20-30 minutes till a total dose of 40mg/kg.
- ◆ If still not controlled Phenytoin can be added (loading 20mg/kg to be diluted with Normal Saline) given over 15-20 minutes followed by maintenance dose of 5-8 mg/kg /day in two divided doses.
- ◆ Fluid and Nutrition to be maintained.

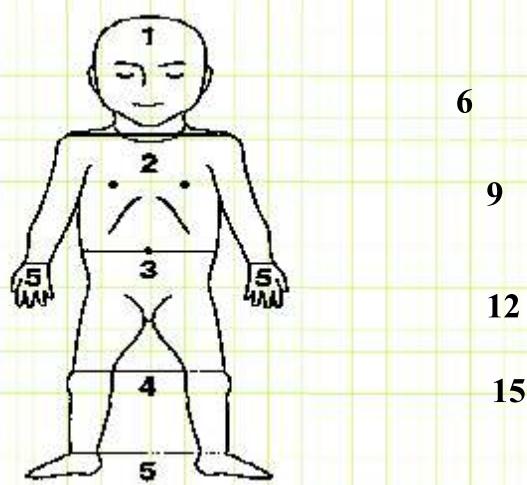
8. MANAGEMENT OF NEONATAL JAUNDICE



Assessment and Management of jaundice in the newborns

Clinical assessment of severity of jaundice in a newborn

In a newborn who has not been treated earlier, Kramer's criteria are used to clinically estimate severity



18-20

Clinical: Visual perception: Kramer 1969

- Jaundice limited to face: Serum Bilirubin of about 6 mg/ dl
- Jaundice extended to trunk: Serum Bilirubin of about 9 mg/ dl
- Jaundice extended to abdomen: Serum Bilirubin of about 12 mg/ dl
- Jaundice extended to legs: Serum Bilirubin of about 15 mg/ dl
- Jaundice extended to feet & hands: Serum Bilirubin of about 18-20 mg/dl

Alert Signs in neonatal jaundice (Pathological Jaundice):

(Any of the following)

- Clinical jaundice in first 24 hrs of life
- Total Serum Bilirubin (TSB) increasing by $> 5 \text{ mg/dl/day}$ or 0.5 mg/dl/hr
- TSB $> 15 \text{ mg/dl}$
- Conjugated serum bilirubin $> 2 \text{ mg/dl}$
- Clinical jaundice persisting for $> 2 \text{ weeks}$ in full term and $> 3 \text{ weeks}$ in preterm neonates

MANAGEMENT OF HYPERBILIRUBINEMIA

Estimates total serum bilirubin in a bay with clinical jaundice for hyperbilirubinemia. Decide for phototherapy/exchange transfusion based on

- Gestation
- Postnatal age in hours
- Presence or absence of risk factors

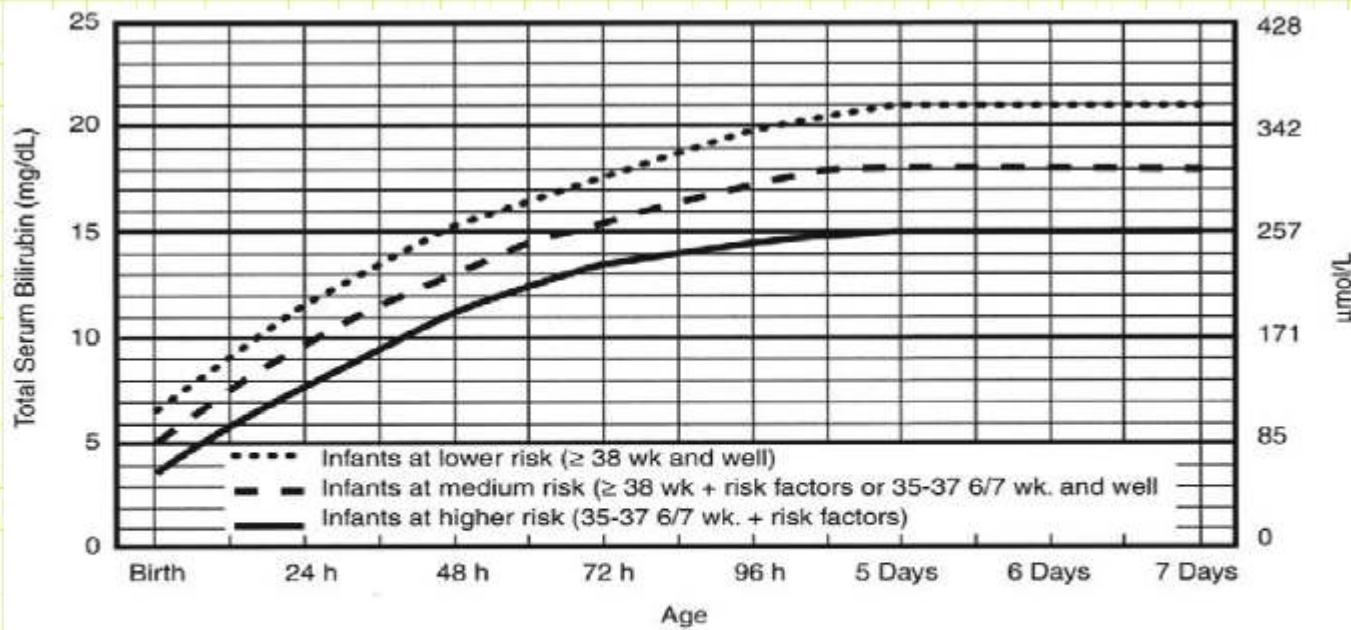
For newborns > 35 weeks

- Consult normgram to identify requirement for phototherapy
- Consult normgram to identify requirement for Exchange transfusion

For newborns <= 35 weeks of gestation, consult

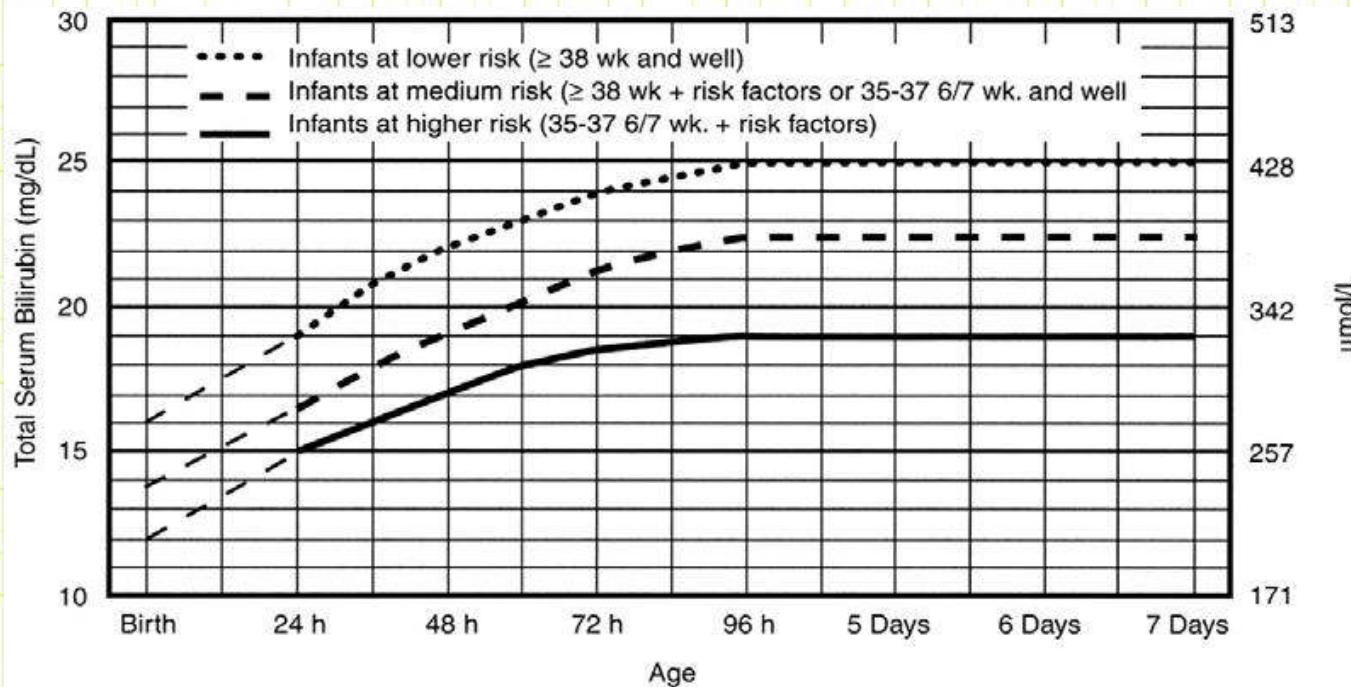
- Table for identifying requirement for phototherapy or exchange transfusion.

Normgram for initiating Phototherapy



- Use total bilirubin. Do not subtract direct reacting or conjugated bilirubin.
- Risk factors = isoimmune hemolytic disease, G6PD deficiency, asphyxia, significant lethargy, temperature instability, sepsis, acidosis, or albumin < 3.0g/dL (if measured)
- For well infants 35-37 6/7 wk can adjust TSB levels for intervention around the medium risk line. It is an option to intervene at lower TSB levels for infants closer to 35 wks and at higher TSB levels for those closer to 37 6/7 wk.
- It is an option to provide conventional phototherapy in hospital or at home at TSB levels 2-3 mg/dL (35-50mmol/L) below those shown but home phototherapy should not be used in any infant with risk factors.

Normgram for instituting Exchange Transfusion



- The dashed lines for the first 24 hours indicate uncertainty due to a wide range of clinical circumstances and a range of responses to phototherapy.
- Immediate exchange transfusion is recommended if infant shows signs of acute bilirubin encephalopathy (hypertonia, arching, retrocollis, opisthotonus, fever, high pitched cry) or if TSB is ≥ 5 mg/dL ($85 \mu\text{mol/L}$) above these lines.
- Risk factors - isoimmune hemolytic disease, G6PD deficiency, asphyxia, significant lethargy, temperature instability, sepsis, acidosis.
- Measure serum albumin and calculate B/A ratio (See legend)
- Use total bilirubin. Do not subtract direct reacting or conjugated bilirubin
- If infant is well and 35-37 6/7 wk (median risk) can individualize TSB levels for exchange based on actual gestational age.

Guidelines for phototherapy and Exchange transfusion in Low birth weight Infants (< 35 weeks)

Weight (Gm)	Phototherapy	Exchange Transfusion
500-750	5-8	12-15
750-1000	6-10	>15
1000-1250	8-10	15-18
1250-1500	10-12	17-20
1500-2500	15-18	20-25

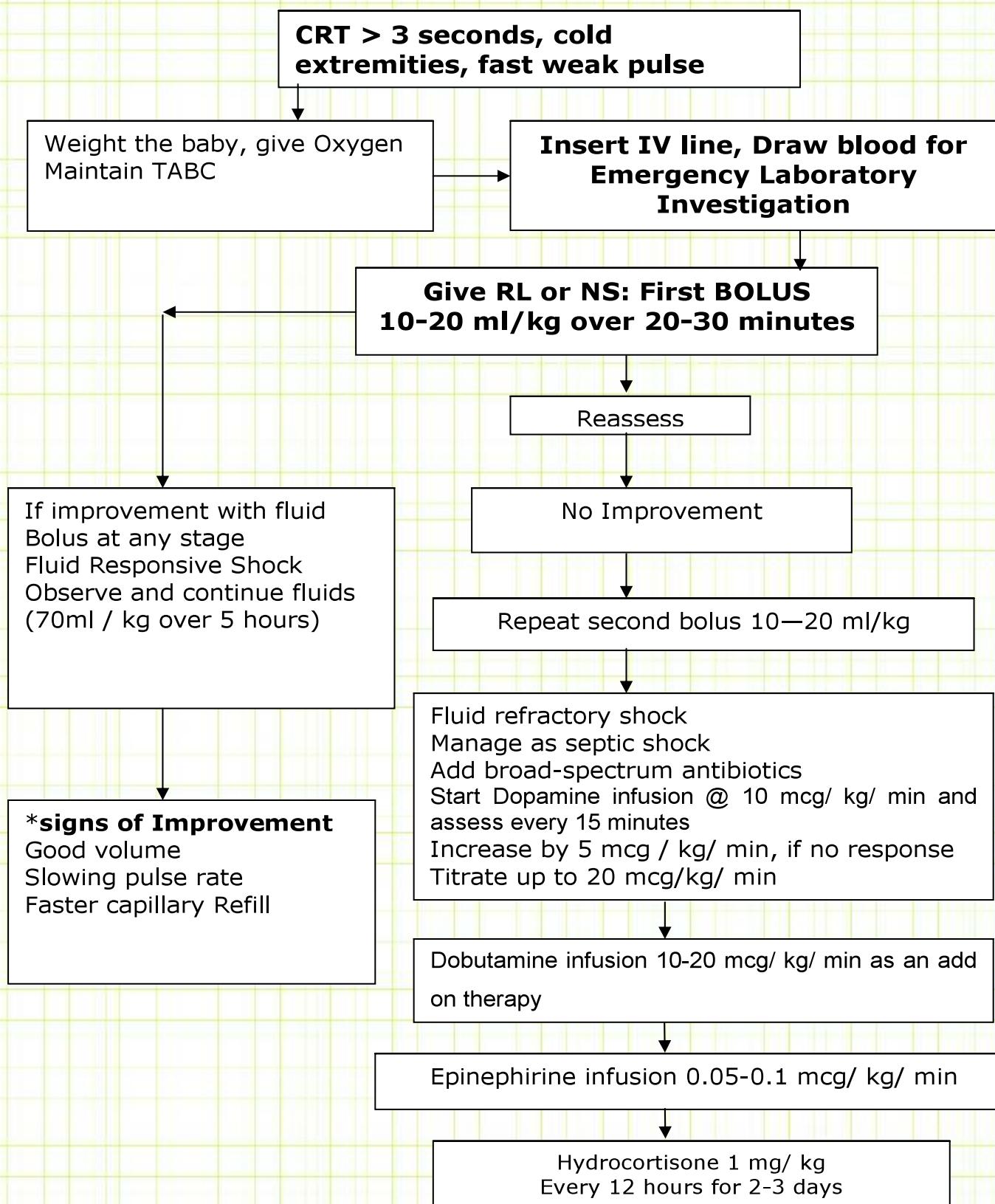
Precaution for phototherapy

1. Baby should be necked.
2. Eyes and genitals should be covered.
3. Newborn should be kept a distance of not more than 45 cms below the light source.
4. They can be kept as close to the phototherapy units as possible.
5. Frequent feeding every 2 hourly and change of posture should be promoted.
6. Once under phototherapy, clinical assessment is not reliable. Serum Bilirubin must be monitored.
7. Stop phototherapy once Bilirubin levels are below the phototherapy level by 2-3 mg%.
8. In case of hemolytic jaundice, check Bilirubin levels after 12 hours of stopping phototherapy to check for rebound increase.

Side effect of phototherapy

- ❖ Increased insensible water loss: breast feed more frequent and for longer duration
- ❖ Loose green stools: weight often and compensate with breast milk.
- ❖ Skin rashes: Harmless, no need to discontinue phototherapy;
- ❖ Bronze baby syndrome: Occurs if baby has conjugated hyperbilirubinemia. If so, discontinue phototherapy;
- ❖ Hypo or hyperthermia: Monitor temperature frequently.

9. MANAGEMENT OF SHOCK IN NEONATES



Administration of Dopamine in a newborn with hemodynamic compromise

How to give Dopamine

1 ml of commercially available contains 40 mg of dopamine. In a baby weighting 2.5 kg if we want to start dopamine at a rate of 10 mcg / kg / min:

$$= 10 \times 2.5 = 25 \text{ mcg / min} = 25 \times 60 = 1500 \text{ mcg / hour} = 1500 \times 24 = 36,000 \text{ mcg / day.}$$

$$= 36 \text{ mg (0.9 ml) of dopamine in 24 hours} = 12 \text{ mg (0.3 ml) of Dopamine in 8 hrs.}$$

It means if we add 0.9 ml of dopamine in 24 ml of fluid and give @ rate of 1 ml / hr with syringe pump or 1 micro drop per min (which is virtually impossible) with the micro drip set, we will give dopamine @ 10 mcg / kg / min.

Increment

If we want to increase dopamine to 15 mcg / kg / min then give the same fluid @ 1.5 ml / hr

The above method is to give a separate infusion of Dopamine, however it could also be added to 24 hours fluids as explained below:

e.g 2.5 kg neonate in shock with a fluid requirement of 100 ml / kg / day, has receive 2 fluid boluses of 10 ml / kg of normal saline, without any improvement. Plan is:

$$\text{Total Fluid needed for this baby in 24 hours} = 100 \times 2.5 = 250 \text{ ml / day}$$

Fluid to be every 8 hours = 85 ml.

Let us learn how much dopamine to be added in 8 hours fluid i.e 85 ml to be given at a rate of 10mcg / kg / min.

$$\text{Amount of dopamine required in one minutes} = 10 \times 2.5 = 25 \text{ mcg}$$

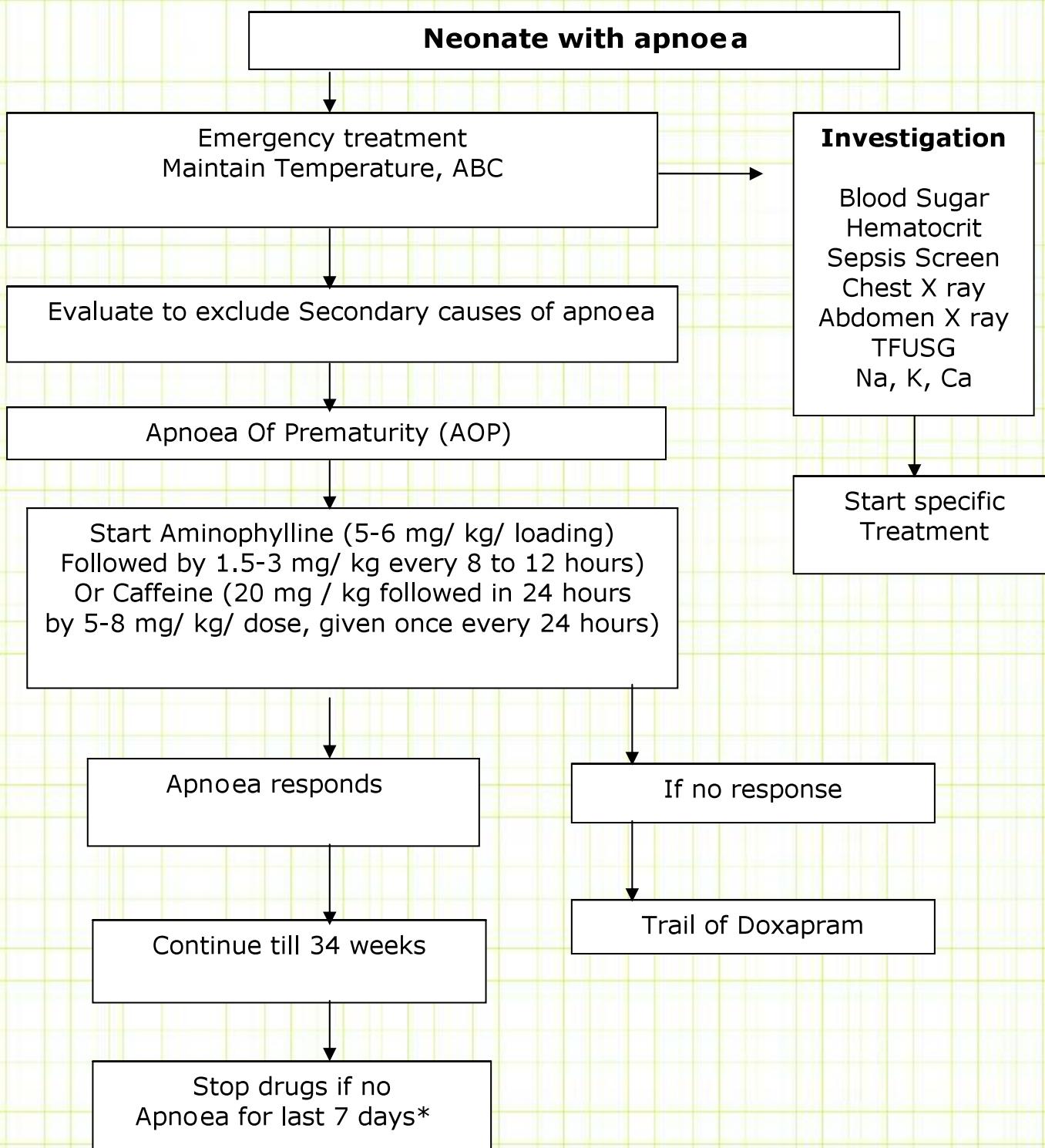
$$\text{Amount of dopamine required in one hour} = 25 \times 60 = 1500 \text{ mcg}$$

$$\text{Amount of dopamine required in 8 hours} = 1500 \times 8 = 12000 \text{ mcg} = 12.0 \text{ mg}$$

$$1 \text{ ml of available dopamine preparation} = 40 \text{ mg of dopamine}$$

To make 12 mg of dopamine we need 0.3 ml, add this volume to 85ml of fluid and give over 8 hours at a rate of 10 ml / hour or at a rate of 10 micro drops / min with a burette set, which will deliver dopamine at a rate of 10 mcg / kg / min.

10. MANAGEMENT OF NEONATAL APNOEA



11. LOW BIRTH WEIGHT BABY

Clinical Features:-

- ❖ Wt < 2500 gms
- ❖ Gestational age < 34 wks
- ❖ Associated problems –
 - Hypothermia & feeding problem
 - RDS
 - IVH
 - Hypoglycemia
 - Hyper bilirubinemia,
 - Infection
 - ROP
 - Cong. malformation

Investigation:-

- ❖ Blood sugar
- ❖ Serum Bilirubin
- ❖ Sepsis screen
- ❖ USG brain
- ❖ Chest X-ray
- ❖ Serum Electrolytes

MANAGEMENT

a. Non drugs:-

- Prevention of hypothermia, hypoxia, hypoglycemia
- Judicious use of oxygen
- Feeding according to the need (refer to annex)

b. Drugs:-

- IV fluid 10% DS on 1st two days followed by Isolite P (refer to fluid management chart)
- Inj Vitamin K
- Inj Aminophylline / Cafine
- Inj Calcium Gluconate
- Surfactant
- Antibiotics (as per necessity)
- Photo therapy if required
- Oral Calcium
- Vitamin A, D, E drops
- Iron drops

Assisted Feeding of Low Birth Weight Neonates

Newborns that require assisted feeding:

- ❖ Preterm < 34 weeks or birth < 1.8 kg
- ❖ Babies having mild respiratory distress
- ❖ Babies with inability to feed at breast or by katori spoon / paladi
- ❖ Oro-facial defects / malformation (Cleft lip or palate)
- ❖ Guidelines for the modes of providing fluids of feeding

Birth weight (gm)	<1200	1200-1800	>1800
Gestation (Wks)	<30	30-34	>34
Initial feeding	Intravenous fluids Try gavages feeds, If not sick	Gavages Try Katori-spoon If not sick	Breastfeeding , if unsatisfactory , give katori –spoon feeds
After 1-3 days	Gavages	Katori-spoon	Breastfeeding
Later (1-3 wks)	Katori-spoon	Breastfeeding	Breastfeeding
After some more time (4-6 wks)	Breastfeeding	Breastfeeding	Breastfeeding

Mode for providing fluids and feeds

Breast milk is the ideal feed for low birth weight babies.

Those unable to feed directly on the breast can be feed expressed breast milk. (EBM) by

Gavage
Katori-Spoon or paladai

Technique of assisted feeding

Gavage feeds

- ❖ Place an oro-gastric feeding catheter of size 5-6 fr. After measuring the correct insertion length from ala of nose to tragus and from tragus to midway between xiphisternum and umbilicus.
- ❖ Check correct placement by pushing in air, with 10 ml syringe and listening with stethoscope over upper abdomen.
- ❖ Attach 10 ml syringe (without plunger) at the outer end of the tube, pour amount of milk and allow milk to trickle by gravity. Close outer end of tube after feeding.
- ❖ Place baby in left lateral position for 15 to 20 min to avoid regurgitation,
- ❖ Leave oro-gastric tube in situ.
- ❖ Pinch the oro-gastric tube during withdrawal.
- ❖ Measure pre-feed abdominal girth just above the umbilical stoma. Do not attempt pre-feed aspirates.
- ❖ Evaluate baby for the cause of ileus, if abdominal girth increases by > 2 cm from baseline.

ROUTINE PRE-FEED GASTRIC ASPIRATES ARE NOT RECOMMENDED.

Katori-spoon feeds

- ❖ place the baby in a semi-upright posture
- ❖ Place the milk filled spoon at the corner of mouth.
- ❖ Allow milk flow into baby's mouth slowly, allowing him to actively swallow, avoiding the spill.
- ❖ Repeat process till required amount has been fed.
- ❖ Try gentle stimulation if baby does not actively accept and swallow the feed.
- ❖ If unsuccessful, switch to gavage feeds.

Intravenous Fluid therapy for Newborns

Criteria for starting intravenous fluids among newborns

- ❖ Neonates with lethargy and refusal to feed
- ❖ Moderate to severe breathing difficulty
- ❖ Babies with shock
- ❖ Babies with severe asphyxia
- ❖ Abdominal distension with bilious or blood stained vomiting.

Choice of Intravenous fluids

- ❖ Determine required volume of fluid a pre birth weight and age. (table 2)
- ❖ Use 10% Dextrose initial 48 hours of life.
- ❖ After 48 hours if baby is passing urine, use commercially available IV fluid, such as Isolyte P.
 - Take normal saline (NS) 20ml/kg body weight.
 - Add remaining fluid volume as 10% dextrose.
 - Add 1 ml KCl / 100 ml of prepared fluid.

FLUID MANAGEMENT IN NEONATES

Fluid requirement according to birth weight in ml / kg / day

Day	>1.5	1.5 -1.0 kg	<1 kg
1	60	80	100
2	75	95	115
3	90	110	130
4	105	125	145
5	120	140	160
6	135	155	175
7	150	170	190

On Day 1 & Day 2, for infant < 1 kg -> 5% dextrose

for infant >1 kg -> 10% dextrose

From Day 3 onwards, fluid of choice-> Isolyte-P for all infants

CONDITIONS REQUIRING FLUID RESTRICTION TO 2/3rd

1. Perinatal asphyxia with oliguria / anuria due to SIADH
2. Patent Ductus Arteriosus
3. Respiratory Distress Syndrome

Administration of IV fluid

- ❖ Use micro-drip infusion set (where 1 ml= 60 micro drops)
- ❖ In this device ml of fluid per hour is equal to number of micro-drop per minutes e.g 6 ml= 6 micro –drop / minutes.
- ❖ Calculate rate of administration, monitor to ensure that micro- dropper delivers required arte.
- ❖ Change the IV infusion set and fluid bag every 24 hours.

Before infusion IV fluid, carefully Check:

- ❖ Expiry date of fluid
- ❖ Seal of the infusion bottle or bag
- ❖ Fluid is clear free from any visible particles.

Monitoring of babies receiving IV fluid

- ❖ Inspect infusion site for redness and swelling
- ❖ If present, stop infusion, remove cannula, and establish a new IV line in a different vein.
- ❖ Check the volume of fluid infused, compare to the prescribed volume and record all findings.
- ❖ Measures blood glucose every nursing shift i.e 6-8 hours.
- ❖ If the blood glucose is less than 45 mg / dl , treat for low blood glucose.
- ❖ If the blood glucose is more than 150 mg / dl, in two consecutive readings, change to 5% Dextrose solution – measure blood glucose again in three hours.
- ❖ Weight the baby daily. If the daily weight loss is more than 5% increase the total volume of fluid by 10 ml / kg body weight for one day.
- ❖ If there is no weight loss in the initial 3 days of life do not give the daily increment.
- ❖ If there is excess weight gain, (3-5%) decrease the fluid intake by 15-20 ml / kg / day.
- ❖ Check urine output: normally a baby passes urine 5-6- times every day.

12. RESPIRATORY DISTRESS

Respiratory distress in a newborn is defined as Respiratory Rate > 60 and / or any of the following signs:

- Grunting
- Retractions
- Cyanosis

Assessment of severity of respiratory distress

Silverman Anderson score and its interpretation

Score	Upper chest retraction	Lower chest retraction	Xiphoid retraction	Nasal flaring	Grunt
0	Synchronised	None	None	None	None
1	Lag during inspiration	Just visible	Just visible	Minimal	Audible with Stethoscope
2	See-Saw	Marked	Marked	Marked	Audible with unaided ear

INTERPRETATION

Score 0-3 = Mild respiratory distress – O₂ by hood

Score 4-6 = Moderate respiratory distress - CPAP

Score > 6 = Impending respiratory failure

Downe's score

Score	Respiratory Rate	Cyanosis	Air Entry	Grunt	Retraction
0	<60/ min	Nil	Normal	None	Nil
1	60-80 / min	In room air	Mild decrease	Audible with stethoscope	Mild
2	>80/min	In 40% FiO ₂	Marked decrease	Audible with Unaided ear	Moderate

Interpretation

Score <6= Respiratory Distress

Score > 6= Impending respiratory failure

Diagnosis based on the X-Ray finding and the Sepsis screen.

Monitoring of a newborn with respiratory distress

- ❖ Clinical assessment with respiratory distress charting
- ❖ Continuous pulse-oximetry is desirable. Change probe site regularly to avoid pressure sores.
- ❖ Maintain saturations between 88-92 % in pre term and 90-93 % in term neonates.
- ❖ Titrate oxygen flow as per SpO₂, reduce and omit oxygen, ensure adequate SpO₂ in room air,

If the baby breathing difficulty worsen or the baby has central cyanosis:

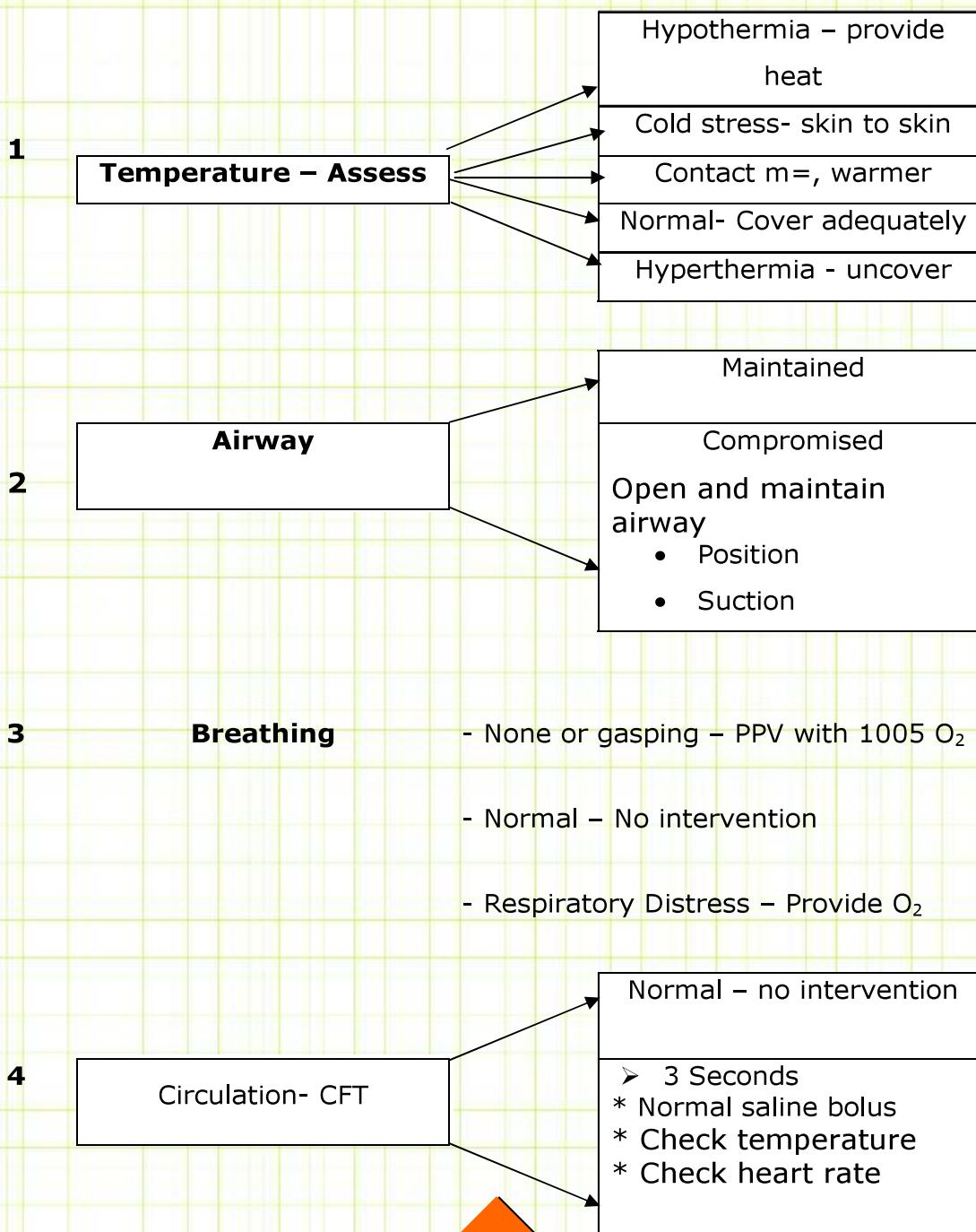
- ❖ Give oxygen at a high rates(5-10 liters / min)
- ❖ In case of severe respiratory distress not prompting on even on high flow oxygen, organize transfer to a tertiary hospital for assisted ventilation and further diagnostic evaluation.

Device for oxygen delivery

Nasal prong	O ₂ Hood	Nasal catheter / Cannulae
<ul style="list-style-type: none">- Use appropriate size prong- Appropriate size prong fits in to nostrils without blanching columella or ala nasi <p><u>Flow rates</u></p> <p>0.5 to 1 L /min for pre term and 1 to 3 L / min in term</p>	<ul style="list-style-type: none">- Choose appropriate sized hood- Use transparent hood <p><u>Flow rate</u></p> <p>> 5L/min</p>	<ul style="list-style-type: none">- Use 6-8 ft. catheter- Measure distance of insertion from nostril to inner margin of eyebrow- Gently insert in to the nostril <p><u>Flow rate:</u> 0.5 – 1 L / min</p>

13. CHECK LIST FOR ASSESSMENT AND MANAGEMENT OF A NEWBORN REQUIRING SPECIAL CARE

A simple Mnemonic is TABC FMFMCF



5. Fluids - If CFT > 3 sec – IV RL / Ns 10 ml / kg
 If stress baby IV 10% Dextrose 2 ml / kg
 If circulation not compromised – normal requirement
6. Medications
- | | | |
|------------|---|---|
| Pneumonia | - | IV antibiotics – Ampicillin, Gentamycin |
| Apnoea | - | IV Aminophylline |
| Meningitis | - | IV Antibiotics |
| Bleeding | - | Inj. Vitamin K 1 mg IM |
| Convulsion | - | Inj. Phenobarbitone, Inj. Phenytoin |
7. Feeds - weight < 1200 gm – Gavage feeds
 weight 1200-1800gms – katori feeding
 weight > 1800gms – breast feeding
8. Monitoring
- i) Temperature - touch method
 - ii) Respiration - Temperature record 2 hrs
 - Apnoeic
 - Gasping
 - Tachyprieic – RR
 - Retraction +/-
 - Grunts +/-
 - iii) Colour - Pink
 - Pink with peripheral cyanosis
 - Pale
 - Cyanosis
 - iv) Heart rate - normal
 - Tachycardia
 - Bradycardia
 - Normal
 - > 3 sec
 - v) SpO₂
 - 90-93
 - < 90
 - > 93

- vi) *Danger signs – Bleeding – Inj. Vit K 1 mg start
- Apnoea- Tactile stimulation & PPV
 - Grunting - Oxygen
 - Severe retractions – Oxygen
 - Abdominal distension – NPO
 - Refer immediately without delay
9. Communication
- a) For referral
- i. Inform parents/ relatives about referral
 - ii. Inform need for referral
 - iii. Communicate place of referral
 - iv. Communicate with the higher centre if possible
 - v. Send a written note about details of birth & care
 - vi. Send a health worker with family if possible
 - vii. Mother to accompany as fast possible
- b) For hospitalized neonates in SNCU
- i) Inform neonate's status to family at least twice daily
 - ii) Report on temperature, colour, perfusion and general activity
 - iii) Report on progress in terms of resolution of RD requirement of O₂, IVF, IV Antibiotics, Feeding
- c) For home care
- i. Exclusive breast feeding
 - ii. Maintain temperature teach tactile assessment
 - iii. Prevent infection cord & eye care
 - iv. Danger signs – Early care seeking
 - v. Maternal nutrition, rest supplements ^ spacing
- d) Follow up
- i. After 48 hrs of discharge, then weekly initially for 2-3 visits
 - ii. Check weight, mode of feeding, enquire problems during each visit
 - iii. Immunization advice
 - iv. Complementary feeding advice

14. CRITERIA FOR ADMISSION TO SPECIAL NEWBORN CARE UNIT & CRITERIA FOR TRANSFER TO STEP – DOWN UNIT AND DISCHARGE

Any newborn with following criteria should be immediately admitted to the SNCU:

- Birth weight < 1800 gm gestation < 34 wks
- Large baby
- Peri natal asphyxia
- Apnoea or gasping
- Refusal to feed
- Respiratory distress (rates > 60 or grunt/ retractions)
- Severe jaundice (Appears < 24 hrs / stains palms & soles Lasts > 2 weeks)
- Central Cyanosis
- Shock (Cold periphery with CFT > 3 seconds and weak fast pulse)
- Coma, convulsion or encephalopathy
- Bleeding
- Major malformation

Criteria for transfer from SNCU to the step down

- Babies whose respiratory distress is improving and do not require oxygen supplementation to maintain saturation
- Babies on antibiotics for completion of duration of therapy
- Low birth weight babies (less than 1800 grams) , who are other wise stable (for adequate weight gain)
- Babies with jaundice requiring phototherapy but otherwise stable
- Babies admitted for any condition but now thermodynamically and hemodynamic ally stable

Criteria for discharge from SNCU

- Baby is able maintain temperature without radiant warmers
- Baby is hemo- dynamically stable (normal CFT, strong peripheral pulses)
- Baby accepting breast feeds well
- Baby has documented weight gain 3 consecutive days; and the weight is more than 1.5 kg
- Primary illness has resolved

In addition to the above, mother should be confident of taking care of the baby at home.

15. INDICATION OF ADMISSION TO NEONATAL STABILIZATION UNIT (NBSU) FOR INITIAL STABILIZATION & TRANSFER TO SNCU.

Newborn presenting with any of the following signs to a facility with neonatal stabilization unit requires admission:

- Apnoea or Gasping
- Respiratory distress (Rate > 70 with severe retraction / grunt)
- Hypothermia
- Hyperthermia
- Central cyanosis
- Shock (Cold periphery, CFT > 3 seconds, weak & fast pulse)
- Significant bleeding that requires blood or component transfusion
- Newborns, who after assessment and stabilization, can be managed at stabilization unit*
- Newborns with respiratory distress, having Respiratory Rate 60-70 / minutes without grunting or retractions (for observation and oxygen therapy)
- Newborn with gestation less than 34 weeks or weight < 1.8 kg (for observation and assisted feeding).
- Newborn with Hypothermia and hyperthermia who are hemodynamically stable after initial stabilization
- Newborn with jaundice requiring phototherapy
- Neonates with sepsis who are hemodynamically stable for observation and antibiotic therapy

Others would require referral to an SNCU after stabilization, if an SNCU and appropriate referral is available in the district.

16. HOUSEKEEPING PROTOCOLS

Disinfection of Equipments

1. Radiant warmers:
 - ❖ Daily: Canopy and mattress should be cleaned with detergent solution and dried.
 - ❖ Weekly: Thorough cleaning after dismantling weekly and after shift of the baby
2. Cots and mattress
 - ❖ Clean everything with 3% phenol or 5% Lysol
 - ❖ Replace mattress whenever surface covering is broken
3. Suction apparatus
 - ❖ Suction bottle should contain 3% phenol or 5% Lysol
 - ❖ Suction bottle should be cleaned with detergent and changed daily
 - ❖ Change tube connected to bottle daily. Flush with water and dry. Soak for disinfection in 2% gluteraldehyde.
 - ❖ Use disposable suction catheter.
4. Oxygen hood
 - ❖ Clean everyday and after each use with detergent
5. Resuscitation bag & mask

Face mask: Disinfection daily and sterilize weekly

 - ❖ Clean with detergent daily and after each use.
 - ❖ Immerse in 2% gluteraldehyde
 - ❖ Rinse with clean water and dry with sterile linen (washed and sun dried)

Resuscitation bag: Disinfection daily and sterilize weekly

 - ❖ Clean with detergent
 - ❖ Immerse in 2% gluteraldehyde
 - ❖ Rinse with clean water and dry with sterile linen
6. Laryngoscope

Wipe blade with 70% isopropyl alcohol
7. IV equipment

Disposal needles and infusion sets should be changed every 24 hours

8. Feeding utensils
Clean with soap and water and boil in water for ten minutes.
9. Thermometer
Wipe with alcohol after use
Store in bottle containing dry cotton

Housekeeping Routines

1. Floor & walls
Walls and sinks must be cleaned with 3% phenol or 5% Lysol at least once a day.
Wet mopping of the room should be done at least 3 times a day.
Avoid sweeping and dry dusting.
2. Disposal of waste and solid.
Closed bins should be available.
The bin must be kept closed and emptied at regular intervals
Plastic bag can be used in dustbin and these bags should be scaled before they are removed
The dustbin should be cleaned and washed properly in running water every day.
3. Cleaning of spills and splashed with suitable disinfectants
Use 10 gm of bleach in 1 ltr. of water. Cover the area with solution for at least 20 minutes and mop with newspaper or cloth.
4. Needles and sharp objects
Discard in polar bleach in a needle proof container Cup, spoon and paladai should be boiled for at least 15 min before use
Use disposable feeding tubes.

All individual items like stethoscope, measuring tapes and probe tips should be cleaned with 70% isopropyl alcohol daily or whenever being used for another baby

- ❖ Disinfection is killing of the live micro-organism and this can be achieved by 20 minutes contact period with 2% gluteraldehyde.
- ❖ Sterilization is killing of live micro-organism along with spore. This can be done by 4 hour contact period with 2% gluteraldehyde.
- ❖ Ensure that fumes of gluteraldehyde are aired out or rinsed completely with water from objects before sing on infants because these can be damaging to the baby.
- ❖ 2% gluteraldehyde once prepared is active for 12 days.

17. INVESTIGATIONS FOR SICK NEWBORN

Sl No	Name of the Investigation	No of times required	Remarks
1	Complete Blood Count	5	DC,TLC,HB,Peripheral smear comment,Band cells,Reticount
2	Serum Billirubin	5	
3	Blood Glucose	15	
4	Micro ESR	4	
5	CRP	4	
6	Serum Electrolytes	2	
7	Blood Culture	1	
8	Blood Grouping /cross match	1	
9	Serum Urea,Creatinine	2	
10	Chest Xray	2	
11	Abdominal XRAY	2	
12	USG of Brain	1	
13	USG of Abdomen	1	
14	CSF Study	2	
15	CT Scan	1	
16	Coombs Test	1	
17	Stool for occult blood	2	
18	Stool Culture	1	
19	Urine culture	1	
20	Swab Culture	1	
21	Urine RE/ME	2	
22	Chest X-Ray	2	

18. ESSENTIAL MEDICINE LIST (SICK NEWBORN) 2011-2012

JANANI-SHISHU SURAKSHA KARYAKRAM (JSSK)

Health & FW Department, Government of Odisha

Total Sl. No.	Sl	Drug Code	Name of the drug / item	Pharma Standard	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
ESSENTIAL DRUG LIST FOR SICK NEWBORN							
1	1	D05005	Inj. Adrenaline Bitartrate	IP	1mg/ml (1:1000)	1ml/Amp 20 Amps/Box	1
2	2	D09046	Inj. Amikacin Sulphate	IP	100 mg/2ml equivalent of Amikacin	2 ml/Vial 20 Vials/Box	5
3	3	D28002	Inj. Aminophylline	IP	25 mg/ ml	10 ml/Amp 20 Amps/Box	1
4	4	D09047	Inj. Ampicillin Sodium (with diluents in plastic container)	IP	Equivalent to 100 mg of anhydrous Ampicillin/Vial	100mg / Vial 20 Vials / Box	23
5	5	D09056	Inj. Ampicillin Sodium (with diluents in plastic container)	IP	Equivalent to 250mg of anhydrous Ampicillin/Vial	250mg / Vial 20 Vials / Box	
6	6	D09042	Inj. Cefotaxime Sodium (with diluents in plastic container)	IP	125 mg / vial	125 mg/Vial 20 Vials/Box	14
7	7	D09053	Inj. Cefotaxime Sodium (with diluents in plastic container)	IP	250mg / vial	250 mg/Vial 20 Vials/Box	
8	8	D09099	Inj. Piperacillin + Tazobactam (with diluents in plastic container)		Piperacillin 1gm + Tazobactam 125mg	1.125 gm/Vial 20 Vials/Box	14
9	9	D17040	Inj Dobutamine		50 mg/ml	5ml / Vial 20 Vials/Box	1
10	10	D29013	Inj. Calcium Gluconate		1gm/Amp.	10 ml/Amp 20 Amps/Box	1
11	11	D17013	Inj. Dopamine HCl (Intravenous Infusion)	BP	40 mg/ml	5 ml/Amp 20 Amps/Box	1
12	12	D20002	Inj. Frusemide	IP	10 mg/1 ml	2 ml/Amp 20 Amps/Box	1
13	13	D05001	Inj. Dexamethasone Sodium Phosphate	IP	4 mg/ml (4.4 mg of Dexamethasone sodium phosphate is equivalent to 4 mg. of Dexamethasone Phosphate)	2 ml/Vial 20 Vials/Box	
14	14	D05002	Inj. Hydrocortisone Sodium Succinate(with diluents in plastic container)	IP	100 mg of hydrocortisone/Vial	2 ml/Vial 20 Vials/Box	1
15	15	D29004	I.V Dextrose 5% (D5)	IP	5% w/v (FFS / BFS Plastic Container)	500 ml/Bottle 20 Bottles/Box	1
16	16	D29005	I.V Dextrose 10%(D10)	IP	10% w/v (FFS / BFS Plastic Container)	500 ml/Bottle 20 Bottles/Box	2
17	17	D29014	Dextrose 25%(D25)		25% w/v	10ml/Amp 20 Amps/Box	0

Total Sl. No.	Sl	Drug Code	Name of the drug / item	Pharma Standard	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
18	18	D29009	Paediatric Maintenance Fluid	IP	Each 100ml contains Dextrose Anhydrous 5gm, Potassium Chloride 0.130 gm, Sodium Acetate 0.320gm, Diabasic Potassium Phosphate 0.026gm, Magnesium Chloride 0.031gm. (FFS / BFS Plastic Container)	500 ml/Bottle 20 Bottles/Box	10
19	19	D09010	Inj. Gentamycin Sulphate	IP	10 mg/ml	2 ml/Vial 20 Vials/Box	8
20	20	D07002	Inj. Phenobarbitone Sodium	IP	200 mg/ml	1ml/Amp 20 Amps/Box	5
21	21	D07007	Inj. Phenytoin	IP	50 mg/ml	2 ml/Amp 20 Amps/Box	1
22	22	D07010	Inj. Lorazepam	IP	1 mg/ml	2 ml/Amp 20 Amps/Box	1
23	23	D29011	Inj. Potassium Chloride NFI	IP	Each ml contains Potassium Chloride 150mg	10 ml/Amp 20 Amps/Box	1
24	24	D29008	Inj. Sodium Bi-Carbonate	IP	7.5% w/v	10 ml/Amp 20 Amps/Box	1
25	25	D29001	I.V Sodium Chloride (Normal Saline)	IP	0.9% w/v (FFS / BFS Plastic Container)	100 ml 20 Bottles/Box	6
26	26	D31001	Sterile Water For Injection (Plastic Container as per IP)	IP	5ml/Amp,(FFS Plastic Container Automatic Continuous Single Unit)	5 ml/Amp 20 Amps/Box	20
27	27	D30021	Inj. Kenandione (Vit. K)		1mg/0.5ml	0.5 ml/Amp 20 Amps/Box	1
28	28	D07011	Phenobarbitone Oral Solution (with measuring cap and palatable, plastic container as per I.P)	USP	20mg/5ml	60 ml/Bottle 20 Bottles/Box	1
29	29	D04026	Paracetamol Drop (Palatable, with dropper and container as per I.P)		100 mg/ 1 ml	15ml / Bottle 20 Bottles/Box	1
30	30	D30022	Calcium Suspension (with measuring cap and palatable, plastic container as per I.P)			100ml / Bottle 20 Bottles/Box	1
31	31	D30023	Vit. E Drop (Palatable, with dropper and container as per I.P)			15ml / Bottle 20 Bottles/Box	1
32	32	D30024	Multivitamin Drop (Palatable, with dropper and container as per I.P)			15ml / Bottle 20 Bottles/Box	1
33	33	D09106	Inj. Vancomycin (with diluents in plastic container)		500mg/vial	500mg /Vial 20 Vials/Box	10

Total Sl. No.	Sl	Drug Code	Name of the drug / item	Pharma Standard	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
CONSUMABLES							
33	1	S02012	Intravenous Set		Child, With built in Airway moulded chamber and Needle, Sterile, Disposable, Non - Toxic, Non Pyrogenic, sterilised by ETO, 2.7 to 3.00 mm tube with fluid filter, non-kinkable tube, Length not less than 150 cms / I.S No. 12655 (part-4 of 2003) , as per Drugs & Cosmetics Act-1940 with CE certification	50 pieces in one box	10
34	2	S02009	Intra Cath		Child, (two way) with closing Cover Type II Sterilised Size 24,26 (Child) with CE certification	50 pieces in one box	5
35	3	S02001	Disposable Syringes		2 CC, With colour coded (as per BIS) needle Sterilised, Luer Mount, Non - toxic CGS 2CC as per Drugs & Cosmetics Act 1940, IS No. 12655 with CE certification	50 pieces in one box	40
36	4	S02002	Disposable Syringes		5 CC, with colour coded (as per BIS) needle Sterilised, Luer Mount, Non - toxic CGS 5CC as per Drugs & Cosmetics Act 1940, IS No. 12655 with CE certification	50 pieces in one box	2
37	5	S02043	Disposable Syringes		10 CC, with colour coded (as per BIS) needle Sterilised, Luer Mount, Non - toxic CGS 10CC as per Drugs & Cosmetics Act 1940, IS No. 12655 with CE certification	50 pieces in one box	5
38	6	S02044	Disposable Syringes		50 CC, with colour coded (as per BIS) needle Sterilised, Luer Mount, Non - toxic CGS 50CC as per Drugs & Cosmetics Act 1940, IS No. 12655 with CE certification	50 pieces in one box	5
39	7	S02006	Disposable Insulin Syringes		100 Unit, With Needle, Sterilised Non-Toxic, Unit 100 with CE certification	50 pieces in one box	20
40	8	S02095	Naso-Gastric Tube (Infant feeding tube)		Size 5, 6	50 pieces in one box	6
41	9	S02096	Suction catheter		Size 6, 8,	Each	5,2,
42	10	S02097	Endotracheal Tube		Size 2.5, 3, 3.5, 4	Each	1
43	11	S02098	Umbilical catheter		Size 3.5, 5 FR	Each	1

Total Sl. No.	Sl	Drug Code	Name of the drug / item	Pharma Standard	Strength / Specification	Unit Pack	Quantity Required/ patient (absolute)
44	12	S02099	De-lee mucous trap			Each	3
45	13	S02100	Baby sock, cap, gloves (Cotton)		1 No. each	Each	2sets
46	14	S02101	3 way stop cock		1	Each	10
47	15	S02102	Baby Napkin (Polythene drape sheet)			Each	2
48	16	S02079	Triple (three) layer face mask		(9cm x 17cm approx.), nose clip adaptable. (Tie on mask of no-woven, hypoallergenic 3 ply construction with filter in between offering >99% standard with 4 tie strings.)	Each	2
49	17	S02104	Eye Shield (for phototherapy unit)			Each	Black sheet
50	18	S02105	Absorbent Clear Acrylic Dressing		Large Oval, Pad size 3.4 inch x 4.25 inch (8,5cm x 10,7cm)	Each	1
51	19	D34007	Microporous Adhesive Paper Tape	-	2.5cm. x 10 yds (9.1 mtr) per roll with CE certification	10 Rolls / packet	1
52	20	S02108	Hand steriliser			100 ml/Bottle 20 Bottles/Box	1
53	21	D18023	Povidone Iodine Lotion (Plastic container as per I.P.)	IP	5% w/v	100 ml/Bottle 20 Bottles/Box	1

OPD MEDICINE

Sl. No	Drug code	Drugs and Consumables	Specifications
1	D29005	Saline Nasal Drop	1 Bottle
2	D09109	Amoxcillin Drop	1 ml= 100 mg
3	D09104	Cefadroxil Drop	1 ml= 100 mg
4	D30024	Multi Vitamin Drop	
5	D16019	Iron drop	1ml= 20 mg
6	D30022	Calcium Suspension	
7	D04026	Paracetamol Drop	1ml=100 mg
8	D18021	Clotrimazole Mouth Paint	1 bottle
9	D18025	Ensamycin Ointment	
10	D09105	Cefixime Drop	1ml=25 mg

19. WORKING DEFINITIONS

1. Live birth

A live birth is complete expulsion or extraction from mother of a product of conception, irrespective of duration of pregnancy, which after separation breaths or shows any other evidence of life, such as beating of heart, pulsation of the umbilical cord or definite movement of voluntary muscles. This is irrespective of whether the umbilical cord has been cut or the placenta is attached. [Include all live birth >500 grams birth weight or 22 weeks of gestation or a crown heel length of 25 cm]

2. Still birth

Death of fetus having birth weight > 500 g (or gestation 22 weeks or crown heel length 25 cm) or more.

3. Birth weight

Birth weight is the first weight of a live or dead product of conception, taken after complete expulsion or extraction from its mother. This weight should be measured within 24 hours of birth, preferably within its first of life itself before significant postnatal weight loss has occurred.

- a) Low birth weight (LBW)- Birth weight of less than 2500g.
- b) Very low birth weight (VLBW)- Birth weight of less than 1500g.
- c) Extremely Low birth weight (ELBW)- Birth weight of less than 1000g.

4. Gestation Age (Best estimate)

The duration of gestation is measured from the first of the last normal menstrual period. Gestational age is expressed in completed days or completed weeks. Please provide the best estimate of gestation. It means that, in your judgment, based on all the historical, ultrasound and baby examination date, the estimate as entered in the database is most accurate. as entered in the database is most accurate.

- a) Preterm Gestation age of less than 37 completed weeks (i.e less than 259 days)
- b) Term- Gestation age of 37 to less than 42 completed weeks (i.e 259 to 293 days)
- c) Post Term- Gestation age of 42 completed weeks or more (i.e 294 days or more)

5. Neonatal period

It refers to the period of less than 28 days after birth.

- a) Early neonatal period refers to the period before 7 days of age.
- b) Late neonatal period refers to the period from completion of 7 days upto 28 days of life.

6. In-born – A baby born in your centre

7. Out-born- A baby not born in your centre.

Neonatal Details

1. Respiratory Distress-Presence of any one of the following criteria:
Respiratory rate more and => 60/ minutes

- ❖ Subcostal / intercostals recessions
- ❖ Expiratory grunt / groaning

Note: the baby should be evaluated in between the feeds and in a quiet state. Respiratory rate should be recorded for at least 1 minute.

2. Hyaline Membrane Disease / RDS
 - A. Presence of the following criteria.
 - ❖ Pre-term neonates
 - ❖ Respiratory distress having onset within 6 hours of birth
 - B. Supportive evidence (Desirable)
 - ❖ Skiagram of chest showing poor expansion with air bronchogram / reticulogranular pattern / ground glass opacity.
3. Meconium Aspiration Syndrome
 - A. Presence of the following
 - ❖ Respiratory distress within one hour of birth in a term baby with Meconium staining of liquor, staining of nails, umbilical cord or skin.
 - B. Supportive evidence (Desirable)
 - ❖ Radiological evidence of aspiration pneumonitis (atelectasis and/or hyperinflation)
4. Transient Tachypnoea / Delayed adaptation

Respiratory distress in a term or borderline term or preterm neonate starting within 6 hours after birth, often requiring supplemental oxygen, but recovering spontaneously within 3-4 days and showing characteristic x-ray changes (Linear streaking at hila and interlobar fluid).
5. Birth Asphyxia: Presence of anyone of the following
 - ❖ Delayed cry
 - ❖ Need for assisted ventilation at birth or
 - ❖ Apgar < 3 at 1 minutes
 - ❖ Apgar < 5 at 5 minutes
6. Moderate – Severe Perinatal Asphyxia / Hypoxia ischemic encephalopathy
 - ❖ Baby with Birth asphyxia has encephalopathy if one more of the following are present Altered sensorium
 - ❖ Inability to feed
 - ❖ Convulsion
7. Pneumonia

In a neonates with respiratory distress, Pneumonia is diagnosed if positive blood culture or any one of the following present

- ❖ Existing or pre-disposing factors: maternal fever, foul smelling liquor, prolonged rupture of membranes.
- ❖ Clinical picture of septicemia (Poor feeding, lethargy, poor reflexes, hypo or hypothermia, abdominal distension etc.)
- ❖ X-ray picture suggestive of Pneumonia
- ❖ Positive septic screen (see septicemia)

8. Sepsis (systemic Infection)

In a newborn having clinical picture suggestive of septicemia (poor feeding, lethargy, poor reflexes, hypo or hypothermia, abdominal distention etc.) and the presence of any one of the following criteria is enough for assigning probable diagnosis of infection:

- ❖ Existence of predisposing factors: maternal fever or foul smelling liquor or prolonged rupture of membranes (>24 hrs) or gastric polymorphs (>5 per high power field).
- ❖ Positive septic screen (two or four parameters (namely, TLC < 5000 / mm, band to total polymorph ratio of > 0.2, absolute neutrophil count less than 1800 / cmm, C reactive protein > 1 mg / dl and micro ESR > 10 mm 1st hour)).
- ❖ Radiological evidences of pneumonia.
- ❖ Positive blood culture

9. Meningitis

In a baby with sepsis, if there is any one of the following

- ❖ Altered Sensorium
- ❖ Convulsions
- ❖ Bulging fontanelle
- ❖ CSF culture is positive, or CSF microscopy and biochemistry are suggestive.

10. Hyper-bilirubinemia

- ❖ Jaundice requiring phototherapy as per charts

11. Hypothermia

- ❖ Skin temperature <35.50 C

12. Hypoglycemia

- ❖ Whole blood glucose of less than 45 mg / dl

13. Major congenital Malformation

- ❖ A malformation that is life threatening or requires surgical correction.

Causes of Neonatal Deaths

Important note:

You should first assign the cause(s) of death and you must choose from the causes of death mentioned below. You may assign more than one cause of death at this stage. You will then be assigning the single most important cause of death. Here you should choose only one cause. This is the primary or underlying cause of death, which is defined as disease or injury, which initiated the train of morbid events leading directly to death. You will exercise your judgment to assign this cause keeping in mind this definition change as above

1. Respiratory distress syndrome: Death in a neonate attributes to respiratory distress syndrome.
2. Meconium aspiration syndrome: Death in a neonates attributable to meconium aspiration
3. Perinatal asphyxia: Death of neonates in the setting of and with features of perinatal hypoxia and / or both asphyxia followed by manifestation of or hypoxic ischemic injury of brain (hypoxic ischemic encephalopathy) or other organs.
4. Septicemia: Death in a neonate attributable to septicemia or meningitis
5. Pneumonia: Death in a neonate attributable to Pneumonia
6. Meningitis: Death in a neonate attributable to Meningitis
7. Congenital Malformation: Death due to lethal to congenital Malformation
8. Prematurity: prematurity as a cause of death is assigned to infants having birth weight of less than 1000g or < 28 weeks of gestation with no asphyxia, sepsis RDS or major malformations.
9. Others: Mention the cause not classified by above such as
 - a) Birth trauma: Death due to birth trauma.
 - b) Tetanus neonatorum: Death due to tetanus neonatorum
10. Not established: Cause of death not established.

20. References

1. Facility Based Newborn Care Training Manual by NNF & UNICEF
2. Neonatal Resuscitation Manual by NNF & UNICEF
3. AIIMS Protocols in Neonatology
4. Essential Pediatrics by O. P. Ghai 7th Edition
5. F-IMNCI Training Manual



Cash less Delivery & Sick Newborn Services