

IDENTIFYING AND ASSESSING MATERNAL RISKS

A handbook for healthcare providers

Gender and Health Equity Project

Series on Decoding Maternal Safety



IDENTIFYING AND ASSESSING MATERNAL RISKS: A handbook for healthcare providers

Gender and Health Equity Project

OTHER BOOKS IN THIS SERIES:

Yaara Hone? Building collective responsibility for maternal safety

Arivu Neravu for Maternal Health: What communities should know and do

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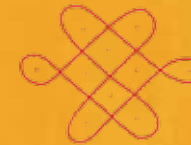


TABLE OF CONTENTS



Foreword	1		
Acknowledgements	3		
List of abbreviations	4		
Glossary	5		
Introduction	14		
List of risk conditions	23		
PART I: THE BASIC COURSE	25		
1. Clinical evaluation: What? How?	27		
Clinical evaluation: Essential steps	28		
Clinical evaluation: Suggested approach	35		
2. Risks identified through a clinical evaluation	37		
Predisposing risk factors	39		
Antepartum obstetric risks	40		
Immediate postpartum obstetric risks	43		
Delayed postpartum obstetric risks	45		
Co-morbid risks	48		
		3. How to identify and assess risk conditions: A cluster approach	52
		Obstetric risks	54
		Co-morbid risks	72
		4. How to analyse overlapping symptoms of risk	95
		5. Principles of management	101
		Managing risks: Essential steps	101
		Managing obstetric risks: Basic principles	103
		Managing co-morbid risks: Basic principles	114
		6. How to understand and tackle customary beliefs and practices	123
		PART 2: ILLUSTRATIVE CASE STUDIES	135
		PART 3: EXERCISES	191
		Further readings	224
		Index	227





FOREWORD

The Gender and Health Equity Project worked on maternal safety and rights from 2000 to 2014 in Koppal district, Karnataka. Although maternal safety is a well recognised goal, it is seriously compromised in gender-adverse contexts by a refusal among healthcare providers, families and communities to recognise or acknowledge women's health needs. There is also little sense of individual or shared responsibility for maternal survival and wellbeing in such contexts.

Under the banner of the Surakshita Taytana Andolana, the project developed strategies in Koppal to improve collective responsibility for maternal safety, and strengthen access to health services. The project worked with pregnant women, their families, communities and healthcare providers. This series of books builds on some of that work. Its multidisciplinary team of writers include Dr. Aditi Iyer (public health), Dr. Anuradha Sreevathsa (ObGyn), Lakshmi Viswanatha (social work), Dr. Srinidhi V. (medicine) and Dr. Vinalini Mathrani (social work).

This handbook on maternal risks draws from the Project's research and field actions. Through research, we discovered that many staff nurses and even doctors in Primary and Community Health Centres ignore or downplay obvious indications of risk. The consequences in terms of maternal safety are far reaching. Given this, we decided to produce a handbook to support and guide healthcare providers in their identification and assessment of maternal risks. The Project's medical doctors, Dr. Srinidhi V. and Dr. Anuradha Sreevathsa wrote this handbook with Dr. Aditi Iyer.

We hope that doctors and staff nurses, who are at the point of first contact for a pregnant woman, find the handbook useful in their obstetric practice.

Gita Sen

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Disclaimer:

This handbook is a ready reckoner on the major obstetric and co-morbid risk conditions that occur during the antepartum and postpartum periods. It does not include risks and complications occurring during labour.

The focus is on risk identification and assessment. The attempt is to provide some thumb rules for how 27 risk conditions can be identified and assessed, without delving into complexities. While the handbook outlines some general principles for how these risks can be managed, it does not discuss risk management in any detail. The intention is to strengthen the knowledge of healthcare providers, who have already received professional training. The handbook should not be treated as a substitute for a textbook on Obstetrics.

ACKNOWLEDGEMENTS

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- Aravinda Ananthraman, who copy edited the handbook.

LIST OF ABBREVIATIONS

ANC	Antenatal Care
APH	Antepartum Haemorrhage
BP	Blood Pressure
CVT	Cerebral (Cortical) Venous Thrombosis
DIC	Disseminated Intravascular Coagulation
ELISA	Enzyme Linked Immunosorbent Assay
FBS	Fasting Blood Sugar
FHS	Foetal Heart Sound
Hb	Haemoglobin
HBsAg	Hepatitis B Surface Antigen
HIV	Human Immunodeficiency Virus
IFA	Iron and Folic Acid
IUD	Intrauterine Death
IUGR	Intrauterine Growth Restriction
PIH	Pregnancy Induced Hypertension
PPBS	Postprandial Blood Sugar
PPH	Postpartum Haemorrhage
PROM	Premature Rupture of Membranes
PV	Per Vaginum
RBS	Random Blood Sugar
STI	Sexually Transmitted Infection
TB	Tuberculosis
TSH	Thyroid Stimulating Hormone
TORCH	Toxoplasmosis, Other, Rubella, Cytomegalovirus, Herpes simplex virus
TT	Tetanus Toxoid
USG	Ultrasonography
UTI	Urinary Tract Infection
VDRL	Venereal Disease Research Laboratory
WBC	White Blood Cell



GLOSSARY

Abortion:	Spontaneous or induced termination of pregnancy before foetal viability.
Abruptio placentae: (placental abruption)	Separation of the placenta from the wall of the uterus prior to labour.
Amenorrhoea:	Absence of menstruation.
Amniotic:	Pertaining to the amnion, the membranous sac surrounding the embryo.
Anaemia:	Deficiency of the oxygen-carrying molecules (haemoglobin) in the red blood cells.
Antepartum:	Pertaining to the period of pregnancy before the onset of labour.
Antepartum Haemorrhage:	See, 'antepartum' and 'haemorrhage'.
Appendicitis:	Inflammation of the appendix that presents as sudden and severe abdominal pain. It is a common surgical emergency.
Breast abscess:	Collection of pus in the breast.
Cardiac murmur:	An abnormal heart sound produced by turbulent blood flow that is audible through a stethoscope.
Cerebral (Cortical) Venous Thrombosis:	Presence of a clot in the venous system of the brain, which restricts blood flow.
Chancroid:	A bacterial sexually transmitted infection caused by <i>Haemophilus ducreyi</i> .

Chlamydia:	A bacterial sexually transmitted infection caused by <i>Chlamydia trachomatis</i> .	Enzyme:	Biomolecules that help chemical reactions.
Chorioamnionitis:	Inflammation of the membranes that cover the foetus. This usually occurs as a complication of PROM.	Enzyme Linked Immunosorbent Assay:	A laboratory test measuring the concentration of antigen/antibody that is commonly used in the diagnosis of HIV.
Coagulation:	Clotting.	Fits:	See "convulsions".
Co-morbidity:	Presence of one or more conditions co-existing with a primary condition. <i>In this handbook</i> , co-morbid condition refers to any illness/condition that co-exists with pregnancy, but is neither a complication of pregnancy nor caused by pregnancy.	Fundal:	Pertaining to the fundus.
Convulsions:	Sudden, jerky, even violent, movements of a part or the whole body; also known as "fits" or "seizures".	Fundus:	<i>In this handbook</i> , fundus refers to the upper part of uterus.
Depression:	A psychological disorder of an abnormally low state of mind.	Gastrointestinal:	Related to the stomach and intestines.
Diabetes:	A medical condition in which the level of sugar in a person's blood is higher than normal over a long period of time.	Gastroenteritis:	Inflammation of the stomach and/or intestines, usually caused by food poisoning and/or an infection.
Disseminated Intravascular Coagulation:	A condition in which clotting mechanisms are impaired leading to the formation of numerous clots in the small blood vessels all over the body. This process which consumes clotting factors excessively, can induce severe bleeding.	Gestation:	The process or the period of development of the foetus inside the uterus from conception to birth.
Domestic violence:	Any form of violence, including physical, sexual and psychological abuse, inflicted on a family member.	Glycemic:	Pertaining to glucose in the blood.
Eclampsia:	A complication of pre-eclampsia in which the woman develops fits.	Gonorrhoea:	A bacterial sexually transmitted infection caused by <i>Neisseria gonococcus</i> .
Ectopic pregnancy:	Pregnancy in which the foetus develops outside the uterus, such as in one of the fallopian tubes.	Gravida:	Refers to a pregnant woman. Nulligravida refers to a woman who has never been pregnant. Primigravida means a woman who is pregnant for the first time. Multigravida refers to a woman who has been pregnant more than once.
		Haemoglobin:	A protein molecule in the red blood cells containing iron that transports oxygen.
		Haemorrhage:	Excessive bleeding from a ruptured blood vessel.

Hepatitis:	Inflammation of the liver.
Hepatitis B Surface Antigen:	A protein of the Hepatitis B virus. Its presence is used as a diagnostic indicator for current Hepatitis B infection.
Hepatomegaly:	The condition of having an enlarged liver.
Human Immunodeficiency Virus:	A virus that causes an immuno-compromised state that can lead to Acquired Immunodeficiency Syndrome (AIDS).
Hydramnios: (or Polyhydramnios)	A condition of pregnancy in which excess amniotic fluid accumulates inside the amniotic cavity.
Hyperemesis gravidarum:	Severe and excessive vomiting during pregnancy.
Hypertension:	Blood pressure, that is consistently 140/90 mm Hg or above.
Infection:	Invasion of microorganisms.
Inflammation:	A biological response of body tissues to harmful stimuli, including injury and infections.
Intrauterine:	Within the uterus.
Jugular Venous Pressure: (or Jugular Venous Pulse)	An indirect measure of pressure on the venous system (sometimes reflecting the problems of the heart) by visualising the internal jugular vein in the neck.
Ketone:	One of the metabolic end products that appear in urine when fats are used by the body to generate energy.
Ketonuria:	Presence of ketone bodies in urine.
Latent:	A state that is existent, but not yet manifest.

Lymphadenopathy:	Swollen lymph nodes.
Lymph nodes:	Small organs distributed all over the body (the groins, the arm pits, the neck etc.) that act as filters of abnormal cells and organisms within the circulatory system.
Malaria:	An infectious condition caused by Plasmodium, a protozoan parasite. It is transmitted by mosquito bites.
Mastitis:	Inflammation of the breast tissue.
Micturition:	Urination.
Migraine:	A neurological disease characterised by recurrent moderate-to-severe and typically one-sided headaches, usually associated with nausea, vomiting and sensitivity to sound, light and smell.
Miscarriage:	Spontaneous termination of pregnancy before foetal viability.
Multi-parity:	Two or more viable previous pregnancies.
Opportunistic infection:	An infection that takes advantage of the weakened immune system of the host.
Oxytocin:	One of the female reproductive hormones, which plays an important role during and after childbirth.
Pallor:	Paleness of the skin, nail bed, tongue and/or conjunctiva, found in conditions like anaemia.
Palpitation:	An awareness of one's own heart beat.
Parasite:	An organism that depends on another organism (host) for its survival. It benefits at the expense of the host. Organisms causing malaria are parasites.

Parity (or Para): Number of previous viable pregnancies. In India, pregnancies under 28 weeks are seldom viable.

Peripheral smear: A layer of blood smeared on a slide that is used for microscopic evaluation. It is commonly used for identifying malarial parasites.

Puerperal sepsis:
(See also, 'sepsis') Sepsis in the postpartum period.

Placenta previa: A condition in which the placenta is at (or very close to) the cervical opening.

Polyhydramnios: See "hydramnios".

Pre-eclampsia:
(or Pregnancy Induced Hypertension or Hypertension of Pregnancy) A pregnancy-related disorder characterised by consistently high blood pressure (140/90 mm Hg or above) and proteinuria.

Premature Rupture of Membranes: A condition of pregnancy, in which the bag of waters breaks open before the onset of labour.

Preterm: Less than 37 weeks of gestational age.

Primi (Primigravida): Woman who is pregnant for the first time.

Proteinuria: Presence of proteins in urine.

Psychosis: A psychological disorder in which feelings, thoughts and behaviour are out of touch with reality.

Retro-placental clot: A clot behind the placenta.

Seizures: See "convulsions".

Sepsis: An illness, which begins with a local infection and grows to involve multiple organs.

Septic abortion: Miscarriage/abortion that is complicated with sepsis.

Sexually Transmitted Infections: Infections that spread through sexual contact.

Sign: An objective characteristic, which is detected by a person other than the affected person, (typically by the healthcare provider during a physical examination).

Symptom: A subjective experience (indicative of an underlying health problem) recognised by the affected person (patient).

Syndrome: A group of symptoms and signs usually occurring together that are not necessarily specific to one condition.

Syphilis: A bacterial sexually transmitted disease, caused by the infection of *Treponema pallidum*.

Tachycardia: Increased heart rate (more than 100 per minute).

Tenderness: Pain experienced when an affected part is touched. It is a sign and not a symptom, and should therefore be differentiated from "pain".

Tension headache: A common form of headache, typically present on both sides and felt as a constant squeezing pain.

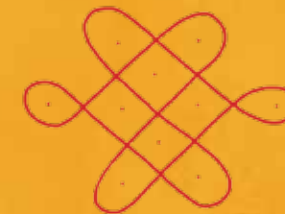
Tetanus Toxoid: Vaccine used for prevention of tetanus.

Thrombosis: Clotting of the blood.

Thrombus: Clot in the blood.

Thrombolysis: Breaking of the clot.

- Thyroid:** A gland situated in the neck producing thyroid hormones that regulate growth and metabolism.
- Toxoplasmosis:** An infectious disease caused by the protozoan *Toxoplasma gondii*.
- Trichomoniasis (or Tric):** A sexually transmitted disease caused by the protozoan *Trichomonas vaginalis*.
- Tuberculosis:** An infectious disease, caused by tubercular bacteria, that most commonly affects the lungs.
- Typical:** Having classical features as described in a textbook.
- Ulcer:** A lesion that erodes the skin or mucous membrane.
- Ultrasonography:** A diagnostic imaging technique, popularly known as 'ultrasound scan', that uses ultrasonic sound waves.
- Vaginal swab:** A technique to obtain a sample of vaginal discharge for investigation(s).
- Venereal Disease Research Laboratory test:** A blood test, named after the place where it was developed, that is used as a screening test for syphilis (one of the sexually transmitted infections.)
- Western blot:** A laboratory technique used to identify a specific protein molecule.



INTRODUCTION

MATERNAL SAFETY: A SOCIAL OBLIGATION

Women contribute to society when they bear children. So maternal safety is a social obligation; the responsibility of every family, community and healthcare provider. *Maternal safety refers to survival and the absence of disability or long-term morbidity due to pregnancy.*

Maternal safety can be assured quite easily by every society with the available obstetric knowledge and technology. Yet, social and health system factors can serve as barriers. Here are some examples:

- Early marriage without contraception and multiple pregnancies from the desire of a son endanger the lives of pregnant teenagers¹ and older women².
- Undernourishment and domestic violence pose risks to safety.
- Poor access to treatment during emergencies denies women the knowledge and technology that could save their lives.
- Negligent or abusive obstetric care contribute to actual harm.

Doctors can help by treating the biomedical risks and complications that threaten maternal survival or cause serious morbidity. As doctors in Koppal know, these risks are more widely prevalent than available statistics would suggest^{3,4}. The trouble with widely prevalent risks is that women and their families consider presenting symptoms normal, and do not report them. Equally, doctors can become unresponsive when every other woman who comes to the antenatal care (ANC) clinic is at risk.

There is a second challenge that doctors know only too well. Medical textbooks do not adequately prepare them to deal with risks in the real world. Depictions of risk in these books tend to be simple and straightforward. But in practice, doctors encounter risks in complex ways.

- Women may reveal atypical symptoms.
- Women may each have a wide range of symptoms and signs that cannot be explained by a single condition.
- Women may report symptoms of an acute ailment unconnected with pregnancy (e.g., viral fever or diarrhoea) but exhibit signs of unreported risks.

How are doctors to deal with the complex business of risk identification without any peer support? How are they to make clinical decisions quickly in crowded ANC clinics? We hope to extend that much needed support through this handbook.

We demonstrate the process through which doctors can identify risks rigorously. We outline how they can tackle the beliefs and practices that contribute to risks. How they can manage risks. In doing so, we hope to help them and other healthcare providers become responsible partners in the drive towards maternal safety.

The handbook draws on the Gender and Health Equity Project's research, its pregnancy tracking system and helpline in Koppal. Other volumes in this series address families and communities. The collection of articles titled Arivu Neravu for Maternal Health provides medical information in small capsules for people who work with communities. The kit titled Yaara Hone takes community-based organisations through the Project's approach to building collective responsibility for maternal safety.



¹ The risks associated with teenage pregnancies include pre-eclampsia and/or obstructed labour.

² The risks associated with multiple pregnancies include anaemia, gestational diabetes, high blood pressure, placenta previa, preterm labour, malpresentation, postpartum haemorrhage and sepsis.

³ According to DLHS-4 (2012-13), 51.9 per cent of girls aged 6-9 years, 46.8 per cent of those aged 10-19, and 53.2 per cent of all pregnant women in rural Koppal had haemoglobin levels below 11 g%. However, since haemoglobin was measured by the highly inaccurate filter paper method, these percentages are rough estimates at best.

⁴ According to DLHS-4 (2012-13), 21.3 per cent of all married women in rural Koppal were under 18 years. This figure is likely to be an underestimate due to misreporting. People in Koppal are aware that child marriages can invoke punitive action. This awareness has grown since DLHS-3 (2007-08) when 44.9 per cent of married women were reported to be under 18.

HANDBOOK ON MATERNAL RISKS

This handbook is for primary care doctors who interact with women in ANC clinics and labour rooms. It is also meant for staff nurses, who are responsible for obstetric care in the doctor's absence.

The central focus of the handbook is on obstetric risks and complications. These risks and complications contribute significantly to maternal morbidity and mortality.

Risks can develop without warning, but they operate in predictable ways once they appear. The project's verbal autopsies of deaths describe how women with severe anaemia ended up with congestive heart failure. How teenage mothers developed eclampsia from pregnancy induced hypertension (PIH). In many cases, obvious symptoms of risk went undetected, despite numerous ANC check-ups. For example, tiredness had become so much a part of the women's lives that their families did not consider it a problem when it worsened during pregnancy. Swelling of the lower limbs did not alert healthcare providers to the possibility of risk. Even when risks were detected, they were often inadequately or inappropriately treated.

The Project's study of the obstetric knowledge of doctors and staff nurses in Primary and Community Health Centres across the district was equally illuminating. The study showed that staff nurses, and even doctors, tended to downplay the seriousness of risks or evaluate risk indicators individually (i.e., not as clusters). This tendency often led to unsystematic or wrong diagnoses and treatment. Building on this research, *this handbook seeks to help doctors and staff nurses improve their ability to identify and assess risks*. These are important because most risks and complications can be managed, if diagnosed early.



WHAT ARE RISKS?

A pregnant woman is at risk when an injury or health condition makes complications more likely during the antepartum, intrapartum or postpartum periods. If left untreated, these risks can result in sickness, or even death, for the mother and/or the baby.

Risks can be viewed at three levels:

- **Risk conditions** are those injuries or health conditions that lead to significant debilitation or loss of life, unless actively managed. For example, anaemia intensifies postpartum haemorrhage (PPH). Puerperal sepsis leads to multi-organ failure. Pregnancies with risk conditions such as these are typically labelled "highrisk".
- **Risk symptoms/signs/test results** such as breathlessness, pedal oedema, proteinuria are indications of risk conditions. Considered individually, these symptoms, signs and test results do not amount to reliable diagnoses of risk conditions. When listed and grouped into clusters, however, these indications form the bases for sturdy diagnoses. For example, swelling on its own could indicate either anaemia or PIH. It could even be physiological. But when swelling is accompanied by tiredness, pallor and a low value of haemoglobin (Hb), it is most probably due to anaemia.
- **Predisposing risk factors** are those factors that increase the chances of a woman developing a risk condition. For example, multi-parity is associated with anaemia and could, therefore, lead to maternal exhaustion and foetal death.

Our definition of risk includes the complication(s) that emerge from it, as the line separating risks from complications is often paper-thin. For example, the symptoms and signs of severe anaemia (a risk condition) overlap with those of congestive heart failure (a complication arising from severe anaemia). We also include other complications that arise from pregnancy itself. For example, atonic PPH can occur even among women who are not anaemic. Either way, these risks and complications put women at increased risk of illness or death.

Our focus in this handbook is mainly on obstetric risk conditions. These risks appear before or after labour, either without adequate warning (e.g., ruptured ectopic pregnancy, PPH), or through a gradual build up of symptoms and signs (e.g., anaemia, postpartum depression). Four of these risk conditions are major contributors to maternal mortality: PPH, anaemia, PIH and puerperal sepsis. To help a provider spot these killers quickly, we illustrate the typical and atypical ways in which they appear and act, through examples from the Project's verbal autopsies.

Although we focus on obstetric risks, we do not deal with complications of labour such as prolonged, obstructed and non-progressing labour, as well as maternal exhaustion and foetal distress. These complications stem from the way in which progressing labour is managed. Further, many of them can be detected with the proper use of a partogram.

Despite our focus on obstetric risk conditions, we do consider co-morbid conditions. These include infections (e.g., urinary tract infection or UTI, tuberculosis or TB), non-infectious conditions (e.g., gestational diabetes, heart disease) and domestic violence. Co-morbid conditions, which tend to be widely prevalent in disadvantaged districts, can seriously complicate a pregnancy or result in death. Given this, a primary healthcare provider must be alert to the symptoms and signs through which these conditions are manifested.

In the handbook, we discuss co-morbid conditions without going into specific details. Our objective is to draw attention to these conditions and thereby establish that pregnant women are not just "obstetric cases". But we do not want to weaken our primary focus on obstetric risk conditions or overwhelm a reader with too many details. Given this, we do not categorise co-morbid conditions according to their severity. Nor do we delineate the principles of management in great detail.

Our list of risk conditions is longer than what would be found in standard textbooks on obstetrics. We include postpartum depression and psychosis among obstetric risks because these are not adequately acknowledged and managed at the primary level. We include co-morbid conditions because of their wide prevalence and adverse health consequences. Doctors and staff

nurses in primary care settings must recognise and deal with all these risk conditions, if their clinical practice is to be meaningful to the women who seek their care.



OUR APPROACH

We dissect 27 risk conditions into their constituent symptoms, signs and test results. We also outline the steps that a healthcare provider must systematically take to analyse them. Doctors may recognise these steps, from their basic training, as the building blocks to a differential diagnosis. We then demonstrate the process of a differential diagnosis through real life cases. The cases were developed from the clinical histories of women who participated in the Project's pregnancy tracking system, helpline and verbal autopsies. Finally, a reader can test his/her knowledge via different self-review exercises.

Our emphasis in this handbook is on the identification and analysis of risks. Given this, we outline the principles of managing each risk condition without getting into details about drugs and dosages. There are national guidelines and protocols available on the subject, to which a reader can refer.



STRUCTURE OF THE HANDBOOK

This handbook has three distinct parts.

PART 1 is instructional. It contains the basic course with six chapters.

- The identification of risks in a woman's pregnancy builds on a thorough clinical evaluation. In **Chapter 1**, we outline the essential steps to such a clinical evaluation and the approach that would enable a doctor or staff nurse draw out risk factors effectively. We also indicate how each step of the clinical evaluation contributes to a differential diagnosis of one or more risk conditions.
- In **Chapter 2**, we highlight the symptoms, signs and test results indicative of 27 risk conditions. We also list out the predisposing factors that increase the likelihood of risk for a pregnant woman. Our objective with this chapter is to help a busy doctor or staff nurse remember these indications of risk while conducting a clinical evaluation.
- In **Chapter 3**, we group the symptoms, signs and test results listed in Chapter 2 into clusters, each cluster representing a risk condition. We then categorise obstetric risk conditions into two or three grades of severity and list the clusters of symptoms, signs and test results within each grade. Our objective with this chapter is to depict how risk factors are clustered and why clusters must form the bases for medical diagnoses.
- Some symptoms like fever or swelling of the lower limbs are common to multiple clusters, which can make diagnosis of risks a tricky business. Our objective with **Chapter 4** is to delineate the clusters to which seven overlapping symptoms potentially belong.
- In **Chapter 5**, we outline the basic principles of managing the risks described in Chapter 3.
- In **Chapter 6**, we assess common socio-cultural beliefs and practices that contribute to obstetric risks and suggest how doctors and staff nurses can routinely tackle them.

PART 2 demonstrates how the principles of diagnosis are to be applied to real life cases.

PART 3 is a self-review section with different types of exercises, such as case studies and true or false statements.

HOW TO USE THIS HANDBOOK

This handbook lends itself to multiple uses. It is a guide-cum-workbook that doctors and staff nurses can use to develop or sharpen their diagnostic skills. It can also serve as resource material for teaching faculty and training programmes on risk identification and analysis. Since the handbook does not address the question of how risks are to be managed, it must be used in conjunction with textbooks, standard treatment guidelines and protocols. References to these resources are provided at the end of the handbook.

The core content of this book is built up step-by-step through the chapters in Part 1. All lessons learnt in Part 1 can then be applied to real life cases in Part 2 and to self-review exercises in Part 3. A reader who wants to learn about the identification and management of risks is encouraged to go through the book from beginning to end. A reader who is clear about all the risks described in Part 1, and is an expert in the science and art of differential diagnosis can go directly to Parts 2 and 3.

We take a reader through 27 risk conditions in **Part 1 (Chapters 3 and 5)**. A list of these conditions can be found in Table 1 (on page 23). A reader who wants to follow one risk condition across both chapters can do so by using the serial number assigned to it. For example, ectopic pregnancy is numbered 3 in both, Chapters 3 and 5; puerperal sepsis is numbered 11, and so on.

To help a reader find the pages on which a particular risk condition is described, we have provided an index that mentions the page numbers in which it appears. The index is at the end of the handbook. Similarly, a reader wanting to follow a particular symptom or sign throughout the handbook (e.g., breathlessness, fever) can do so by referring to the index.

Part 2 demonstrates the application of key ideas detailed in Part 1 to real life cases. We encourage readers to actively participate in making a differential diagnosis for each case, either individually or in small groups.

Part 3 allows a reader to review his/her skills. Answers to all the self-review exercises are provided at the end of the handbook. We request users to go to these answers only after they have completed the exercises.



LIST OF RISK CONDITIONS

1. Hyperemesis gravidarum
2. Threatened abortion/miscarriage
3. Ectopic pregnancy
4. Anaemia
5. Pregnancy induced hypertension
6. Intrauterine death
7. Abruptio placentae
8. Placenta previa
9. Premature rupture of membranes
10. Postpartum haemorrhage
11. Puerperal sepsis
12. Cerebral (cortical) venous thrombosis
13. Mastitis
14. Postpartum depression
15. Postpartum psychosis

• *Obstetric risk conditions*

16. Domestic violence
17. Urinary tract infection
18. Malaria
19. Tuberculosis
20. Sexually transmitted infections
21. Human immunodeficiency virus infection
22. Hepatitis B and C
23. TORCH infections
24. Thyroid problems
25. Diabetes
26. Chronic hypertension
27. Heart disease

• *Co-morbid conditions*



PART 1

BASIC COURSE

CHAPTER 1

CLINICAL EVALUATION: WHAT? HOW?

A doctor and staff nurse's identification and analysis of risk are only as good as the quality of their clinical evaluation. A clinical evaluation consists of three activities: (1) detailed history
(2) physical examination
(3) investigations

Through these activities, the doctor and staff nurse elicit information about a woman's potential for risk, as well as the symptoms, signs and test results that point to actual risk conditions.

The quality of the clinical evaluation partly depends on the quality of the doctor and staff nurse's interactions with the pregnant woman. **Two qualities become important in this regard: (1) their clinical skills, and (2) their attitude and approach to patient care.** An approach that encourages pregnant women to talk freely about their health problems and concerns is essential at all times. This approach is even more critical in social contexts in which women's lives are devalued, and their health problems are unrecognised or deliberately ignored.

In this chapter, we outline the essential steps to a clinical evaluation, as well as the approach that would make this evaluation effective.



CLINICAL EVALUATION: ESSENTIAL STEPS

The clinical evaluation is the process through which a doctor or staff nurse diagnoses the risk conditions present in a pregnant woman. In this section, we describe the set of three activities that constitute a clinical evaluation and indicate how each activity contributes to a differential diagnosis of the woman's risk conditions.



STEP 1. DETAILED HISTORY

The first step of the clinical evaluation involves an interaction between the doctor or staff nurse and a pregnant woman. From this interaction emerges a record of the woman's demographic, obstetric and medical history, the ANC services she received to date, and, most important, her current symptoms. The quality of this information (the 'history') greatly depends on the doctor and staff nurse's line of questioning as well as their approach to patient care.

We offer some basic suggestions on how questioning can become effective (see Box 1) and outline an approach to patient care in the next section. In Chapter 2, we list the symptoms indicative of obstetric and co-morbid risk conditions that can emerge from the act of taking a detailed history.

Preliminary Information

Preliminary information is gathered as a matter of routine. Questions typically focus on:

- Age
- Obstetric Score / GPAL (Gravida, Para, Abortions, Living children)
- Last Menstrual Period
- Registration for ANC services

- ANC services received:
 - Types of services received
 - Whether Tetanus Toxoid (TT) injections and Iron and Folic Acid (IFA) tablets were given
 - Whether IFA tablets were consumed
 - Whether IFA tablets produced any side effects
 - Whether routine ultrasonography (USG) was done
 - Whether any abnormalities were detected in the USG
- Other healthcare providers contacted during the current pregnancy to date, and whether any risks were identified during these prior consultations.

Obstetric and Medical History

Next, a woman's obstetric and medical history must be explored through specific questions on:

- Previous miscarriage(s), abortion(s) and stillbirth(s)
- Obstetric risks and/or complications during earlier pregnancies
- Infectious diseases either occurring in the past or continuing into the current pregnancy
- Pre-existing chronic diseases that are likely to complicate the current pregnancy

BOX1: HOW TO ASK QUESTIONS?

1. Start with broad questions that do not suggest any answer. Listen carefully to what the woman has to say without interrupting her.
 - “How do you feel?”
 - “Do you have any problem?”
2. Next, ask specific but neutral questions to understand what the woman reported.
 - “What is the problem?”
 - “Can you tell me more about it?”
3. Alternatively, ask specific but more pointed questions to understand what she initially reported. If she reported having headaches, ask:
 - “How often do you get headaches?”
 - “Can you describe them?”
4. Probe for other symptoms from the clusters to which her initial symptoms could belong. The clusters of symptoms, signs and test results that indicate risk conditions are listed in Chapter 3. Sticking with the example of headaches, ask the woman:
 - “Do you have blurred vision?”
 - “Do you experience dizziness?”
 - “What about abdominal pain?”

NOTE: If there are no clear answers to the broad questions under 1, ask more pointed questions, but be wary. Leading questions can evoke inaccurate and ill-considered answers. In this case, begin the physical examination, and ask specific questions in relation to emerging signs.

Current symptoms (“Current history”)

The emphasis at this stage is to encourage the woman to report her health problems by building rapport, being attentive and non-judgemental. Following a first set of opening questions (see Box 1), the doctor or staff nurse can ask more specific questions to fully understand the reported problem(s), and elicit further information about associated symptoms. The clusters of symptoms associated with 27 risk conditions are detailed in Chapter 3.

Based on the woman’s symptoms and history, a doctor and staff nurse should be able to draw up a list of probable diagnoses of her risk condition (or conditions).

How does Step 1 trigger ideas about probable diagnoses?

A woman’s history should spark off a doctor and staff nurse’s memory of all the risk conditions that could possibly explain her symptoms. These risk conditions would comprise their list of probable diagnoses. The doctor and nurse’s ability to identify probable diagnoses depends on their knowledge of the clusters of symptoms (along with signs and test results) of these risk conditions.

At times, a doctor or staff nurse may initially think of just one or two risk conditions to explain a woman’s symptoms. This would happen if the symptoms are typical representations of a risk condition. For example, frequent headaches and giddiness with swelling of the lower limbs typically represent PIH. In such cases, the list may contain just one probable diagnosis.

Quite often, however, symptoms either represent one risk condition in an atypical way, or depict multiple co-existing risk conditions. In such cases, the doctor and staff nurse must make sure that they identify all the conditions that could explain a woman’s symptoms. This identification would give rise to an elaborate list of probable diagnoses, which can then be taken to Step 2.

STEP 2. PHYSICAL EXAMINATION

There are three parts to a doctor or nurse's physical examination.

Vital Parameters

Vital parameters are measurable signs of a person's health status.

These include:

- Temperature
- Pulse
- Blood Pressure (BP)
- Weight
- Urine output

General Examination of the Entire Body

A physical examination typically consists of an assessment of the body, from head to toe, via:

- Inspection (the act of observing)
- Palpation (the act of feeling)
- Auscultation (the act of hearing through a stethoscope)

In Chapter 2, we list some of the important signs of risk that can be observed (e.g., pallor, swelling of the limbs, etc.) and felt (e.g., pitting pedal oedema, tender hepatomegaly, tender abdomen, etc.). The act of hearing through a stethoscope yields findings related to the functioning of the lungs and cardia.

Obstetric Examination

The three-pronged approach to a general examination (inspection-palpation-auscultation) must be complemented by specific obstetric examinations, as listed below.

- Routine examination, which consists of an abdominal examination to measure fundal height, determine foetal position, and hear foetal heart sounds, etc.

- Per vaginum (PV) examination, which should be done only if there are symptoms such as abdominal pain, genital itching, foul-smelling discharge, leaking PV or, in some instances, a bleeding PV. A PV examination must NOT be done if placenta previa is suspected. In Chapter 2, we list the findings of a PV examination that indicate risk (e.g., foul-smelling discharge, active bleeding PV).
- Breast examination, which is usually done in the postpartum period if the woman reports symptoms indicative of mastitis or breast abscess (described in Chapter 3 under condition 13).

How do Steps 1 and 2 help narrow down the list of probable diagnoses to one or more conditions?

At the end of Steps 1 and 2, a doctor and staff nurse should be in a position to identify the condition(s) that best explain a woman's symptoms and signs. The information gathered would also allow them to eliminate some conditions from their initial list of probable diagnoses. This process of elimination will take them close to a preliminary diagnosis of the risk condition (or conditions, as the case may be). All that remains are investigations to confirm or rule out this preliminary diagnosis.

STEP 3. INVESTIGATIONS

Routine Investigations

- Blood tests during the first ANC check-up to identify (a) blood group and type, (b) syphilis through the VDRL (Venereal Disease Research Laboratory) test, (c) Hepatitis B through the HBsAg (Hepatitis B Surface Antigen) test, and (d) HIV (Human Immunodeficiency Virus) through rapid tests and/or the ELISA test.

- Urine albumin, sugar and microscopy during the first ANC check-up, and later as required
- Blood test to identify the level of Hb, at least once every trimester
- USG, preferably once per trimester

Specific Investigations

- Sputum test, in case of suspected tuberculosis (TB)
- Peripheral smear, in case of suspected malaria
- Vaginal swab, in case of a suspected sexually transmitted infection (STI)
- CT scan to aid diagnosis, in case of suspected Cerebral/Cortical Venous Thrombosis (CVT).
- Relevant tests to confirm/rule out other suspected risk conditions.

How does Step 3 contribute to a final diagnosis of one or more risk conditions?

Routine and specific investigations provide the last bit of evidence that a doctor and staff nurse can use to confirm their preliminary diagnosis. This evidence can also be used to justify the elimination of conditions from the list of probable diagnoses. This process of elimination and confirmation leads the doctor and staff nurse to a final diagnosis of the risk condition(s) that must be treated.

WHAT NEXT?

It would help a doctor and staff nurse to know if there are contributing social factors that must be tackled as part of risk management. These include the factors that prevent the pregnant woman from returning regularly for ANC check-ups and/or following medical advice. These also include factors linked to the woman's daily life that worsen her risk (e.g., excessive work burdens; inadequate food, rest and support; violence and abuse).

The doctor or staff nurse should assess these contributing factors by talking at some length to the woman and her family.

CLINICAL EVALUATION: SUGGESTED APPROACH

Doctors have a responsibility to do no harm and to act in a woman's best interest at all times. This responsibility is even more crucial in communities that do not value women enough to take their health needs and risks seriously. However, at least two challenges arise when this responsibility is translated into action.

The first challenge for a doctor or staff nurse is to elicit symptoms from the woman, when she and her family do not consider these as problematic. The second challenge is to persuade the woman and her family to follow medical advice, especially if it means modifying long-standing beliefs and behaviour. Having the right approach to patient care can help doctors and staff nurses deal with these challenges. Our suggestions for such an approach are listed below.

BUILDING RAPPORT

Building rapport with every pregnant woman is important, even though time can be short in a crowded ANC clinic. Rapport goes a long way in risk identification and management.

The doctor and staff nurse can build rapport by being approachable and attentive, and making the woman feel comfortable.

BEING RESPECTFUL

Women who come for ANC or delivery must receive respectful maternity care. This is essential in all contexts. It is even more crucial in communities in which women experience disrespect on a daily basis.

For a doctor or a staff nurse, being respectful means upholding a woman's dignity by not being rude, insulting, sexist or dismissive. This, in turn, means not condemning her for the actions that led up to her pregnancy.

Often, it is not a woman's fault when her family gets her married before she turns 18 or when the desire for a son pushes her into multiple pregnancies. Even if the adverse actions leading up to a pregnancy were within the woman's control, she must not be denied good quality care. Being non-judgemental means having an open mind. It means recognising that a woman is entitled to good care, even if she is poor, illiterate, from a lower caste, too young or old, unmarried or a sex worker.

A doctor and staff nurse can also demonstrate respect when they assure privacy while taking the woman's history and conducting a physical examination. Sometimes, very small alterations to the examination room (e.g., rearranging furniture, putting up screens) allow privacy to be assured. These changes are worth making. In addition to upholding dignity, they allow the woman to feel comfortable enough to talk about sensitive issues.

BEING PROACTIVE

This means being alert to the possibility of a woman developing risks and complications at any time during pregnancy and postpartum. It also means monitoring the woman who has been identified with risks by:

- Periodically assessing her signs
- Conducting repeat tests
- Supervising her medication
- Informing her and her family about the implications of her risks
- Persuading them to take prescribed medication and follow medical advice
- Tackling social factors that worsen the woman's risk and/or obstruct her treatment
- Referring her when it is clear that she will benefit from medical attention at a higher centre. And completing the referral by letting the doctor at the higher centre know about her arrival



CHAPTER 2

RISKS IDENTIFIED THROUGH A CLINICAL EVALUATION

While pregnancy is not an illness, any pregnant woman can develop a condition that puts her pregnancy, health and life at risk. Some risk conditions build up over a period of time and lead to fairly predictable complications (e.g., anaemia, PIH). Some risk conditions appear without warning (e.g., ectopic pregnancy, PPH). Whether predictable or unpredictable, a doctor and staff nurse must identify risks and complications quickly to prevent adverse consequences.

In this chapter, we flag the symptoms, signs and test results that indicate 15 obstetric risk conditions and 12 co-morbid conditions. Doctors and staff nurses who remember these indications of risk are more likely to recognise them.

To aid a healthcare provider's memory, we divide a woman's pregnancy into three time periods: antepartum, immediate postpartum, delayed postpartum. Within each time period, we line up the indications of risk as they could emerge in the course of a clinical evaluation.¹ These include:

1. Symptoms that are elicited when a doctor or staff nurse asks questions
2. Vital parameters that are routinely recorded
3. Signs that are discovered through a physical examination using a look-feel-hear approach
4. Clinical findings of PV and breast examinations
5. Results of diagnostic investigations



¹ While the symptom, signs and test results indicative of obstetric risk conditions vary between the three time periods, those indicative of co-morbid conditions do not.

Within each of these categories of the clinical evaluation, we arrange symptoms, signs and test results anatomically from head-to-toe, wherever possible.

We also list out the factors that predispose a woman to develop these risk conditions. Predisposing factors are not risks per se, as they do not relate to a woman's current pregnancy. Instead, they relate to a woman's obstetric and medical history, and to her demographic profile, which can be captured through a detailed history. Some of these factors are termed, within the public health system, as the five toos: (1) too young, (2) too old, (3) too short, (4) too many children, (5) too short a gap (between children).

Predisposing factors indicate that certain categories of women are potentially at risk in their current pregnancy. They are not at risk per se. However, their potential for developing risk must be systematically assessed at different times during pregnancy and postpartum. If these clinical evaluations reveal the presence of one or more risk conditions, the women would truly be at risk. For example, while any teenage pregnancy is a cause for concern, the one that ends up with eclampsia becomes a cause for alarm.

Predisposing factors, symptoms, signs and test results should not be considered individually while diagnosing risk. Such diagnoses are not robust. They must always be viewed in clusters. The clusters indicative of obstetric and co-morbid risk conditions are discussed in Chapter 3.



PREDISPOSING RISK FACTORS

RISK FACTORS ELICITED BY TAKING A DETAILED HISTORY

1. AGE

18 years or below (teenage pregnancy, 'too young')

35 years or more (elderly pregnancy, 'too old')

2. HEIGHT

140 cm or less (short statured, 'too short')

3. PARITY

Four or more (multi-parity, 'too many pregnancies')

4. SPACING

Gap of two years or less between the current pregnancy and the one immediately before it (poor spacing, 'too short a gap')

5. OBSTETRIC HISTORY

- Miscarriage
- Stillbirth
- Prolonged labour (going beyond 24 hours from the onset of labour)
- Haemorrhage
- Delayed placental expulsion (occurring more than 30 minutes after delivery of the baby)
- Caesarean section

6. MEDICAL HISTORY

- Diabetes
- Hypertension
- Heart disease
- Jaundice
- Thyroid problems
- Infections such as STIs, HIV, TB, TORCH (Toxoplasmosis, Other, Rubella, Cytomegalovirus and Herpes simplex virus infections)
- Other conditions continuing into pregnancy

ANTEPARTUM OBSTETRIC RISKS

(The symptoms, signs and test results observed before delivery)



SYMPTOMS OF RISK ELICITED BY ASKING QUESTIONS

- Headache
 - Blurred vision
 - Flashes of light
 - Giddiness
 - Fainting
 - Swelling of the face
-
- Cough
 - Breathlessness
-
- Excessive vomiting
 - Increased thirst
 - Decreased urine output
 - Small quantities of high coloured urine, or no urine at all
 - Abdominal pain
 - Lack of foetal movements
 - Spotting/bleeding with or without clots
 - Swelling of the hands and body
-
- Swelling of the lower limbs

GENERAL SYMPTOMS

- Fever
- Disinterest in routine work
- Tiredness
- Sudden weight gain
- Convulsions
- Loss of consciousness



SIGNS OF RISK ELICITED BY CHECKING A WOMAN'S VITAL PARAMETERS

1. Increased body temperature
2. Raised pulse (more than 100/min)
3. BP of 140/90 mm Hg or higher
4. BP of 90/60 mm Hg or lower
5. High BP followed by falling BP
6. No weight gain since the last ANC visit
7. Decreased urine output (less than 400 ml in 24 hours)

SIGNS OF RISK ELICITED BY CONDUCTING A PHYSICAL EXAMINATION

Observe

1. Pallor in the eyes (palpebral conjunctiva)
2. Sunken eyes
3. Yellowish discolouration in the eyes (sclera)
4. Dryness of the tongue
5. Breathlessness
6. Fresh and profuse bleeding PV

Feel

1. Tender and enlarged liver
2. Tender abdomen
3. Enlarged lymph nodes (inguinal)
4. Cold and clammy extremities
5. Skin retreats slowly after being pinched
6. Pitting oedema of the legs, hands and/or body

Hear

1. Basal crepitations
2. Cardiac murmurs

Obstetric Examination

- 1. Absent foetal heart sound (FHS)

PV Examination

- 1. Leaking PV (with clear / blood-stained / meconium-stained / foul-smelling discharge)



TEST RESULTS INDICATING RISKS

Routine Blood Tests

- 1. Hb level below 11 g%
- 2. Raised white blood cell (WBC) count

Specific Blood Tests

- 1. Elevated liver enzymes (SGOT, SGPT, etc.)
- 2. Electrolyte imbalance (abnormal levels of sodium, potassium, etc.)
- 3. Abnormal coagulation profile (abnormal platelet count, bleeding time, clotting time, etc.)
- 4. Elevated levels of blood urea and serum creatinine.

Urine Tests

- 1. Ketonuria
- 2. Proteinuria

Imaging

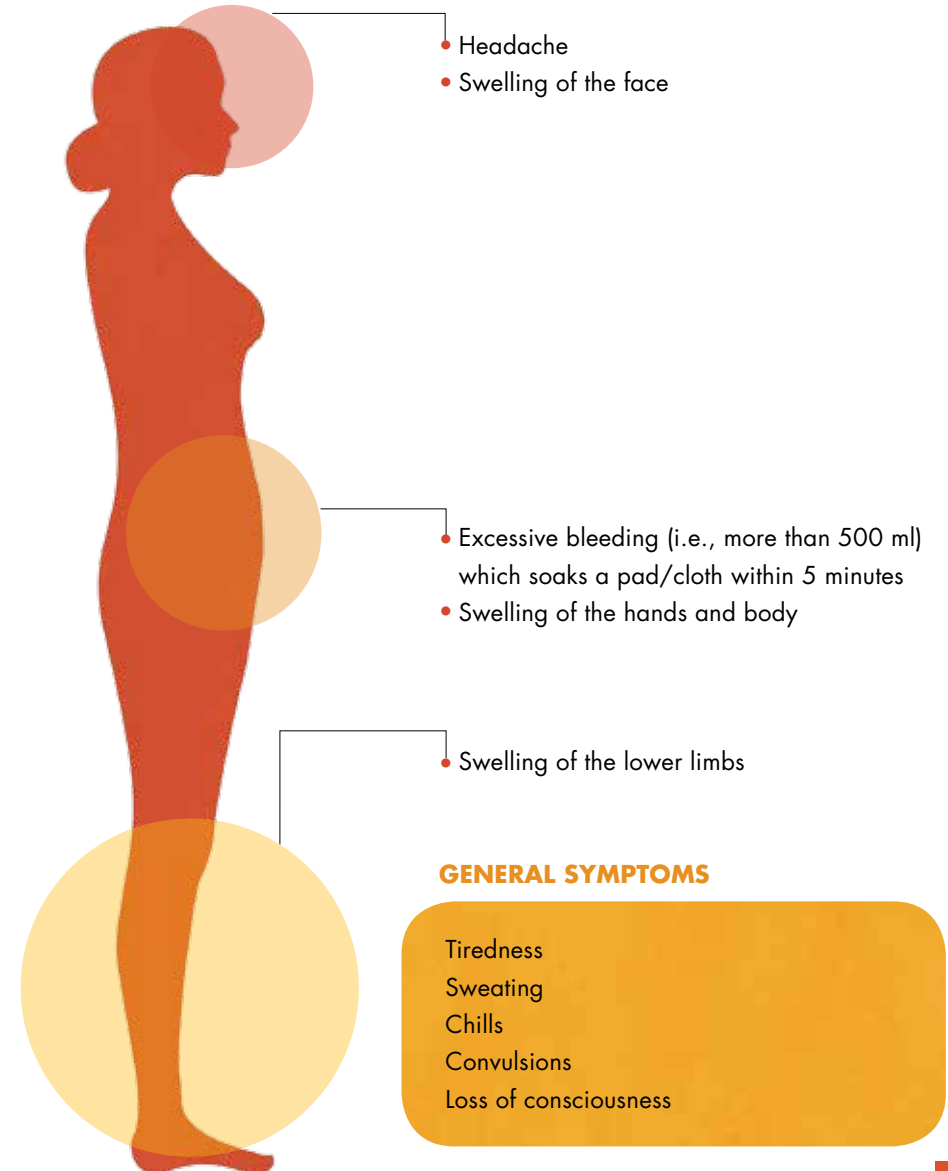
- 1. USG showing pregnancy outside the uterus, with or without rupture
- 2. USG showing multiple gestation
- 3. USG / Doppler revealing no foetal cardiac activity
- 4. USG showing a retroplacental clot with no foetal activity
- 5. USG showing the placenta at the lower pole

IMMEDIATE POSTPARTUM OBSTETRIC RISKS

(The symptoms, signs and test results observed up to 24 hours after delivery)



SYMPTOMS OF RISK ELICITED BY ASKING QUESTIONS



GENERAL SYMPTOMS

- Tiredness
- Sweating
- Chills
- Convulsions
- Loss of consciousness

SIGNS OF RISK ELICITED BY CHECKING A WOMAN'S VITAL PARAMETERS

1. Increased pulse rate (more than 100/minute)
2. BP of 140/90 mm Hg or higher
3. BP of 90/60 mm Hg or lower
4. Reduced urine output

SIGNS OF RISK ELICITED BY CONDUCTING A PHYSICAL EXAMINATION**Observe**

1. Pallor in the eyes (palpebral conjunctiva)
2. Breathlessness or gasping

Feel

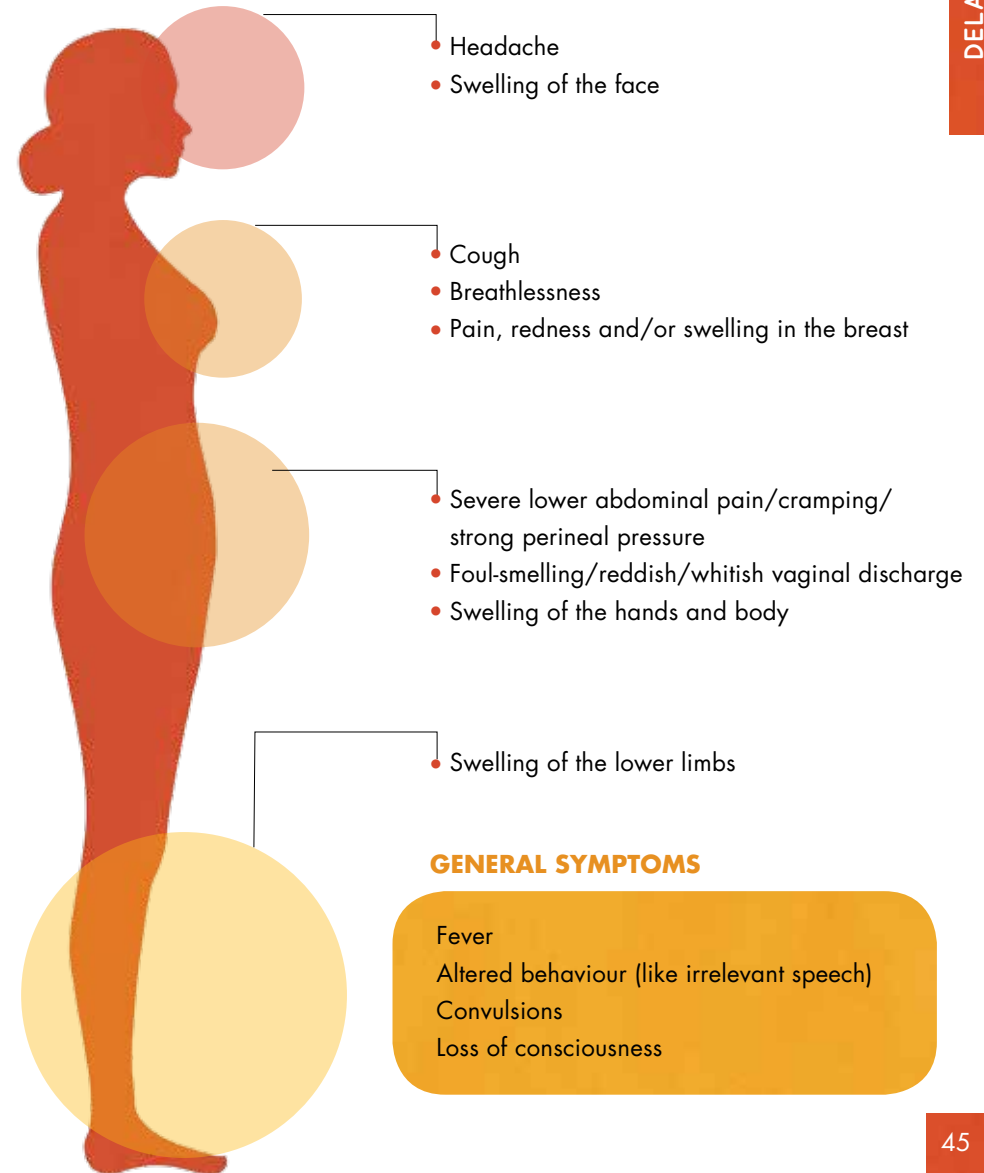
1. Cold and clammy extremities
2. Pitting oedema of the legs, hands and/or body

PV Examination

1. Active fresh and profuse bleeding

**DELAYED POSTPARTUM
OBSTETRIC RISKS**

(The symptoms, signs and test results observed 24 hours to seven days after delivery)

SYMPTOMS OF RISK ELICITED BY ASKING QUESTIONS

SYMPTOMS RELATED TO THE MIND

1. No interest in daily activities
2. No interest in feeding or caring for the baby
3. Disturbed or reduced sleep
4. Loss of appetite
5. Loss of joy in life
6. Feelings of shame, guilt or inadequacy
7. Withdrawal from family and friends
8. Intense irritability and anger
9. Severe mood swings
10. Thoughts and/or attempts to harm oneself (suicidal) or others (including the baby)
11. Refusal to feed the baby
12. Crying without provocation
13. Auditory and visual hallucinations

SIGNS OF RISK ELICITED BY CHECKING A WOMAN'S VITAL PARAMETERS

1. Raised or lowered temperature
2. Increased pulse rate (more than 100/minute)
3. BP of 140/90 mm Hg or higher
4. BP of 90/60 mm Hg or lower
5. Reduced urine output

SIGNS OF RISK ELICITED BY CONDUCTING A PHYSICAL EXAMINATION

Observe

1. Pallor in the eyes (palpebral conjunctiva)
2. Yellowish discolouration in the eyes (sclera)
3. Breathlessness and/or gasping
4. Stroke-like findings
5. Injury marks suggestive of suicidal attempts
6. Petechial haemorrhages

Feel

1. Tender and enlarged liver
2. Enlarged lymph nodes (inguinal)
3. Cold and clammy extremities
4. Pitting oedema of the legs, hands and/or body

Hear

1. Basal crepitations
2. Cardiac murmurs

Breast Examination

1. Increased local temperature in the breast
2. Tenderness in the breast

PV Examination

1. Active fresh and profuse bleeding
2. Foul-smelling discharge PV



TEST RESULTS INDICATING RISKS

Routine Blood Tests

1. Hb level below 11 g%
2. Raised WBC count
3. Elevated liver enzymes (SGOT, SGPT, etc.)
4. Abnormal coagulation profile (abnormal platelet count, bleeding time, clotting time, etc.)
5. Elevated levels of blood urea and serum creatinine

Imaging

1. CT scan of the brain revealing thrombus

Aspiration

1. Pus on aspiration / drainage of a swelling in the breast

CO-MORBID RISKS

Co-morbid conditions do not vary by gestational age. They can appear anytime during pregnancy: antepartum (any trimester), intrapartum or postpartum.



SYMPTOMS OF RISK ELICITED BY ASKING QUESTIONS

-
- Headache
 - Giddiness
 - Blurred vision
 - Hoarse voice
- Persistent cough for 2-3 weeks
 - Breathlessness
 - Palpitations
 - Chest pain
- Pain in the flanks
 - Pain/discomfort in the lower abdomen
 - Nausea and/or vomiting
 - Loss of appetite or increased appetite
 - Diarrhoea
 - Constipation
- Haematuria (blood in urine)
 - Burning sensation or pain while urinating
 - Increased frequency of urination
 - Increased urge to urinate
 - Vaginal discharge
 - Genital itching
 - Blebs and/or ulcers in the genital area
 - Tingling and numbness in the genital area
 - A history of STI
- Tremors
 - Swelling of the feet and/or hands

GENERAL SYMPTOMS

- Fever
- Chills
- Night sweats
- Muscle ache / muscle weakness / body ache / joint pain
- Weakness / tiredness
- Skin rash
- Intolerance to heat or cold
- Tension / nervousness / irritability
- History of frequently occurring infections
- Poor wound healing
- Excessive thirst
- Weight loss or weight gain
- Loss of consciousness

SYMPTOMS RELATED TO VIOLENCE

1. No interest in talking or eating
2. History of suicidal thoughts or attempts to commit suicide
3. History of name calling and beating and/or forced sex
4. Woman being prevented from meeting her family and friends

SIGNS OF RISK ELICITED BY CHECKING A WOMAN'S VITAL PARAMETERS

1. Increased body temperature
2. Pulse, lowered (less than 60/minute) or raised (more than 100/minute)
3. BP of 140/90 mm Hg or more
4. No weight gain since the last ANC visit

SIGNS OF RISK ELICITED BY CONDUCTING A PHYSICAL EXAMINATION

Observe

1. Pallor in the eyes (palpebral conjunctiva)
2. Sunken eyes

3. Bulging eyes
4. Yellowish discolouration in the eyes (sclera)
5. Dryness of the tongue
6. Injury marks or bruises over the body

Feel

1. Enlarged lymph nodes (cervical, inguinal etc.)
2. Enlarged liver
3. Dryness of the skin
4. Cold and clammy extremities
5. Pitting oedema of the legs, hands and/or body

Hear

1. Decreased air entry on auscultation
2. Basal crepitations
3. Cardiac murmurs

PV Examination

1. Watery and frothy discharge
2. Ulcers: single or multiple; painful or painless; shallow or deep
3. "Strawberry cervix" characterised by punctate haemorrhagic spots



TEST RESULTS INDICATING RISKS

Routine Blood Tests

1. Hb below 11g%
2. Raised WBC count
3. Peripheral smear positive for malarial parasite
4. Rapid test and/or ELISA positive for HIV
5. HBsAg test positive for hepatitis B
6. Fasting blood sugar (FBS) > 126 mg%
Postprandial blood sugar (PPBS) > 200 mg%
or Random blood sugar (RBS) > 200 mg%

Specific Blood Tests

1. Thyroid profile revealing abnormal levels of T3, T4 and TSH
2. IgM antibody positive against Toxoplasma / Rubella / Cytomegalovirus infection
3. Detection of Herpes simplex virus (HSV) antigen

Urine Tests

1. Microscopy showing more than 6 pus cells/HPF (High Power Field)
2. Gram stain showing Gram-negative diplococci (gonorrhoea)
3. Culture showing growth such as E. coli

Vaginal/Cervical Swab

1. Gram stain showing Gram-negative diplococci (gonorrhoea)
2. Wet mount positive for *Trichomonas*

Examination of Fluid/Scrapings from Lesions

1. Microscopic examination revealing *T.pallidum*
2. Direct isolation test detecting Herpes simplex virus

Vaginal/Cervical Swab

1. Gram stain showing Gram-negative diplococci (gonorrhoea)
2. Wet mount positive for *Trichomonas*

Sputum Examination

1. Sputum test positive for AFB (acid fast bacilli)

Skin Tests

1. Mantoux test positive (more than 10 mm)

Imaging

1. Chest X-ray showing patchy consolidations
2. Echocardiogram revealing an abnormality

CHAPTER 3

HOW TO IDENTIFY AND ASSESS RISK CONDITIONS: A CLUSTER APPROACH

In this chapter, we group the symptoms, signs and test results listed in Chapter 2 into clusters that must form the basis for the diagnosis of risk conditions. These clusters of symptoms, signs and test results pertain to 27 risk conditions, which are listed in Table 1. Of the 15 obstetric risk conditions discussed in this chapter,¹ we highlight the four major killers: PPH, anaemia, PIH, puerperal sepsis. Since pregnancy makes women susceptible to co-morbid conditions, we also include 12 co-morbid conditions that interact with pregnancy. Co-morbid conditions affect both the health of the woman and the outcome of her pregnancy. We discuss these two-way linkages between pregnancy and each of the co-morbid conditions.

We classify the indicative symptoms, signs and basic test results of 15 obstetric risk conditions into three stages of severity:

- (1) initial
- (2) advanced/serious
- (3) life-threatening²



¹ We focus on risk conditions that emerge during pregnancy and postpartum, but not those that occur during labour (e.g., prolonged, obstructed or non-progressing labour, maternal exhaustion and foetal distress) for reasons discussed in the Introduction.

² In order to keep the handbook sharply focused on obstetric risk conditions and avoid overloading readers with information, we do not grade co-morbid conditions in terms of severity.

Each stage connotes a different level of damage to the health and survival chances of the woman. An obstetric risk condition like PIH has symptoms, signs and test results indicative of all three stages, as it grows progressively worse if left untreated. On the other hand, conditions like ruptured ectopic pregnancy, PPH or CVT do not progress from an initial stage. They are serious or life-threatening conditions when they first appear.

A healthcare provider must keep three points in mind while using the cluster approach to diagnosing risks.

1. The symptoms, signs and test results within each cluster is extensive. In practice, all of these indications may not be present in a woman at any given time. Further, they can reveal risk conditions in atypical ways. For example, PIH may manifest as high BP with headache, but without swollen limbs (a typical symptom) or other indicators within the cluster.
2. Some symptoms and signs are common to a number of different risk conditions. For example, swelling of the lower limbs is a symptom of anaemia as well as PIH. Fever is common to sepsis and malaria, as well as to the severe forms of UTI and mastitis. Even so, each cluster (symptoms, signs and test results) uniquely points to one risk condition. Therefore, a healthcare provider must consider symptoms, signs and test results in clusters while diagnosing risk conditions.
3. A woman may have more than one risk condition at any given time. Therefore, the process of diagnosis does not automatically end after one risk condition has been identified. If some symptoms, signs or test results cannot be explained by a single risk cluster, then the doctor or staff nurse should consider the possibility of the woman having multiple risk conditions.



OBSTETRIC RISKS

1. HYPEREMESIS GRAVIDARUM

This condition, which commonly occurs in the first trimester, is characterised by excessive vomiting. The inability to retain food consumed orally leads to dehydration and food aversion. Left untreated, dehydration can lead to acute kidney failure and even death.

	INITIAL STAGE	ADVANCED STAGE
SYMPTOMS	Excessive vomiting	Excessive vomiting
	Tiredness	Tiredness
	Increased thirst	Increased thirst
	Decreased urine output, high coloured urine	Very little high coloured urine, or no urine at all
		Fainting
SIGNS	Hypotension	Hypotension
	Rapid pulse	Rapid pulse
	Dry tongue	Dry tongue
		Sunken eyes
		Skin retreats slowly after being pinched
TEST RESULTS	Ketonuria	Ketonuria
	Electrolyte imbalance	Electrolyte imbalance

2. THREATENED ABORTION/MISCARRIAGE

This condition is characterised by bleeding before the foetus becomes viable.

	INITIAL STAGE
SYMPTOMS	Bleeding with or without clots
	Lower abdominal pain
SIGNS	Closed cervical os
TEST RESULTS	USG showing gestational sac with a live foetus

3. ECTOPIC PREGNANCY

In this condition of pregnancy, the embryo develops outside the uterus such as in the fallopian tubes. If not identified early and terminated, an ectopic pregnancy can rupture the fallopian tube and develop into a **life-threatening emergency**. A ruptured ectopic pregnancy causes internal bleeding and hypovolemic shock that can lead to death in the absence of emergency intervention.

	SERIOUS STAGE	LIFE THREATENING STAGE
SYMPTOMS	Spotting/bleeding	Spotting/bleeding
	Lower abdominal pain	Lower abdominal pain Giddiness Fainting
SIGNS		Tender cervix Tender abdomen Falling BP Rapid pulse
TEST RESULTS	USG showing pregnancy outside the uterus without rupture	USG showing pregnancy outside the uterus with rupture

4. ANAEMIA

In this condition, the oxygen carrying capacity of the blood gets reduced due to deficient Hb (below 11 g%) in the blood. Anaemia with Hb values below 7 g% is classified as severe anaemia.

Untreated severe anaemia can lead to congestive heart failure, maternal exhaustion, PPH, even death. It can also lead to health problems in the long-term, including pelvic pain and discomfort (due to genital and pelvic infections), an inability to feed the baby and an increased clotting tendency.

	INITIAL STAGE	ADVANCED STAGE
SYMPTOMS	Tiredness	
	Disinterest in routine work	Disinterest in routine work
	Breathlessness on exertion	Breathlessness while sitting or lying down
	Swelling of the lower limbs	Swelling of the whole body Cough Right-sided upper abdominal pain
SIGNS	Pallor	Pallor
	Pitting pedal oedema	Pitting oedema all over the body Basal crepitations Tender hepatomegaly
TEST RESULTS	Hb level between 7 and 10.9 g%	Hb level below 7 g%

5. PREGNANCY INDUCED HYPERTENSION

This pregnancy-related disorder is characterised by increased BP and proteinuria. PIH has two grades of severity — moderate and severe depending on the values of BP, level of proteinuria and the presence/absence of danger signs. Severe PIH is further categorised into ‘imminent eclampsia’ and ‘eclampsia’ based on the absence or presence of convulsions. Left untreated, severe PIH can lead to loss of consciousness and even death.

PIH during the current pregnancy could put a woman at risk of PIH and foetal growth restriction in a subsequent pregnancy, or even chronic hypertension and stroke later in life.

	INITIAL STAGE (Pre-eclampsia)	ADVANCED STAGE (Imminent eclampsia)	LIFE-THREATENING STAGE (Eclampsia)
SYMPTOMS	Swelling of the lower limbs even after 8-10 hours of rest	Swelling of the limbs, body, face and vulva	Swelling of the limbs, body, face and vulva
SIGNS	Pitting pedal oedema		
	BP of 140/90 to 160/110 mm Hg		
TEST RESULTS	Proteinuria of 2+ or less		
		Sudden weight gain	Sudden weight gain

	SERIOUS STAGE	LIFE-THREATENING STAGE
SYMPTOMS	Headache (unrelieved by regular analgesics)	Headache (increasing in frequency, unrelieved by regular analgesics)
	Giddiness	Giddiness
	Blurred vision	Blurred vision
	Flashes in the eyes	Flashes in the eyes
	Upper abdominal pain	Upper abdominal pain
	Decreased urine output	Decreased urine output
	Cough	Cough
		Convulsions
		Loss of consciousness
SIGNS	Pitting oedema all over the body	Pitting oedema all over the body
	BP of 160/100 mm Hg or more	BP of 160/100 mm Hg or more
	Urine output below 400 ml in 24 hours	Urine output below 400 ml in 24 hours
		Basal crepitations
TEST RESULTS	Proteinuria higher than 2+	Proteinuria higher than 2+
		Haemolysis
		Elevated liver enzymes
		Lowered platelet count

6. INTRAUTERINE DEATH (IUD)

In this condition, the foetus dies while still in the uterus. If the dead foetus is not expelled quickly, the woman can develop sepsis and/or coagulation failure and die.

	INITIAL STAGE	ADVANCED STAGE
SYMPTOMS	Lack of foetal movements	Lack of foetal movements Fever
SIGNS	No foetal heart sounds on auscultation	No foetal heart sounds on auscultation Foul-smelling discharge Increased body temperature
TEST RESULTS	USG / Doppler revealing no foetal cardiac activity	USG / Doppler revealing no foetal cardiac activity Abnormal coagulation profile

7. ABRUPTIO PLACENTAE (PLACENTAL ABRUPTION)

This is one of the causes of antepartum haemorrhage (APH). Here, the placenta separates prematurely from the wall of the uterus causing concealed or revealed bleeding. If not attended to immediately, the chances of hypovolemic shock and IUD are very high. These, in turn, can lead to infection, coagulation failure and even death.

	SERIOUS STAGE	LIFE THREATENING STAGE
SYMPTOMS	Abdominal pain Bleeding/spotting	Abdominal pain Bleeding/spotting Lack of foetal movements
SIGNS	High BP Tense and tender abdomen	High BP followed by falling BP Tense and tender abdomen Rapid pulse Cold and clammy extremities
TEST RESULTS	USG showing retroplacental clot	USG showing retro-placental clot with no foetal activity

8. PLACENTA PREVIA

This is the other cause of APH. The placenta lying at, or very close to, the cervical opening may start separating at the time of labour causing heavy bleeding. This is a life-threatening emergency. Steps should be taken to stop the bleeding immediately.

LIFE-THREATENING STAGE

SYMPTOMS

Bleeding PV like a tap

No abdominal pain

Giddiness

Fainting

SIGNS

Active fresh and profuse bleeding

Falling BP

Rapid pulse

No signs of labour

TEST RESULTS

USG showing placenta at the lower pole

9. PREMATURE RUPTURE OF MEMBRANES (PROM)

In this condition of pregnancy, the placental membranes rupture before the onset of labour. If left untreated, it can lead to infection, foetal compromise, sepsis, coagulation failure and even death.

INITIAL STAGE

ADVANCED STAGE

SYMPTOMS

Watery discharge PV before the onset of labour pains

Watery discharge PV for 18-24 hours (or more) before the onset of labour pains

Foul-smelling discharge

Fever

Lack of foetal movements

SIGNS

Clear fluid leaking PV

Clear / blood-stained / meconium-stained / foul-smelling fluid leaking PV

Increased body temperature

TEST RESULTS

Raised WBC count

10. POSTPARTUM HAEMORRHAGE (PPH)

This condition is characterised by uncontrolled, profuse and active bleeding from the uterus after delivery. PPH is most commonly caused by a cervical tear (trauma), retained bits of placenta (tissue) or uterine atony (tone). **It is a life-threatening emergency.** If bleeding is not controlled immediately, the woman is certain to go into hypovolemic shock and die.

Survivors of PPH run the risk of developing renal dysfunction and Sheehan's syndrome (characterised by loss of breast milk, an inability to breastfeed, an inability to menstruate regularly, loss of hair in the genital area and arm pit, and low BP). They could also develop infertility due to disturbed menstruation, and blood-borne diseases from contaminated blood transfusions.

	LIFE-THREATENING STAGE
SYMPTOMS	Excessive bleeding after delivery of the baby
	Pads getting soaked in blood within 5 minutes
	Tiredness
	Sweating
	Chills
SIGNS	Falling BP
	Pallor
	Rapid pulse
	Breathlessness / gasping
	Loss of consciousness
	Cold and clammy skin

11. PUERPERAL SEPSIS OR SEPTIC ABORTION

Puerperal sepsis typically sets in 24-48 hours after childbirth, or bleeding following a miscarriage/induced abortion. If the condition sets in after a miscarriage or induced abortion, it is termed "septic abortion".

It starts as a local infection of the perineum or the birth canal and then spreads to other parts of the body. In its severe form, it involves multiple organs (the kidneys, liver, lungs, etc.), causing multi-organ failure, disseminated intravascular coagulation (DIC) and even death.

	SERIOUS STAGE	LIFE-THREATENING STAGE
SYMPTOMS	History of childbirth or bleeding (due to miscarriage) or induced abortion 24-48 hours prior to the onset of symptoms	History of childbirth or bleeding (due to miscarriage) or induced abortion 24-48 hours prior to the onset of symptoms
	Foul-smelling vaginal discharge	Foul-smelling vaginal discharge
	Severe lower abdominal pain / cramping / strong perineal pressure	Severe lower abdominal pain / cramping / strong perineal pressure
	Fever	Fever
		Altered behaviour (including irrelevant speech)
		Breathlessness

	SERIOUS STAGE	LIFE-THREATENING STAGE
SIGNS	Increased body temperature	Increased / lowered body temperature
	Rapid pulse	Rapid pulse
TEST RESULTS		Low BP
		Decreased urine output
		Jaundice
		Petechial haemorrhages
	Raised WBC count	Raised WBC count
		Lowered Hb
		Elevated liver enzymes
	Elevated levels of blood urea and serum creatinine	
	Abnormal coagulation profile	

12. CEREBRAL (CORTICAL) VENOUS THROMBOSIS

In this condition, a clot in the venous system of the brain restricts blood flow from parts of the brain. The extent, duration and location of the obstruction crucially determine the health outcome for the woman, which is long-term morbidity or death.

	LIFE-THREATENING STAGE
SYMPTOMS	Headache
	Fever
	Irrelevant behaviour
	Convulsions
	Loss of consciousness
SIGNS	Increased body temperature
	Stroke-like findings
TEST RESULTS	Thrombus visible in a CT scan of the brain

13. MASTITIS

Mastitis is a condition in which the breast tissue gets inflamed, most commonly due to bacterial infection caused by incomplete breastfeeding. If left untreated, the condition can develop into a breast abscess (a collection of pus), cause sepsis and even death.

	INITIAL STAGE	ADVANCED STAGE
SYMPTOMS	Breast pain	Severe breast pain
	Redness in the breast	Redness in the breast
		Swelling in the breast
		Fever
SIGNS	Tenderness in the breast	Tenderness in the breast
	Increased local temperature	Increased local temperature
		Increased body temperature
TEST RESULTS	Raised WBC count	Raised WBC count
		Pus on aspiration / drainage

14. POSTPARTUM DEPRESSION

Postpartum depression, a psychiatric disorder that affects some women after delivery, is characterised by persistently low spirit, despondency and loss of interest in practically everything. In its severe form, the woman may have suicidal thoughts or even attempt to end her life.

	INITIAL STAGE	ADVANCED STAGE
SYMPTOMS	Loss of interest in daily activities	Loss of interest in daily activities
	Disturbed or reduced sleep	Disturbed or reduced sleep
	Loss of appetite	Loss of appetite
	Loss of joy in life	Loss of joy in life
	Feelings of shame, guilt or inadequacy	Feelings of shame, guilt or inadequacy
	Withdrawal from family and friends	Withdrawal from family and friends
	No interest in feeding or taking care of the baby	No interest in feeding or taking care of the baby
		Intense irritability and anger
		Severe mood swings
		Thoughts of self-harm or harming the baby
	History of suicidal attempts	

	INITIAL STAGE	ADVANCED STAGE
SIGNS	Nothing significant	Injury marks suggestive of suicidal attempts
TEST RESULTS	Normal CT scan (no lesion in the brain)	Normal CT scan (no lesion in the brain)

15. POSTPARTUM PSYCHOSIS

Postpartum psychosis, a psychiatric disorder that affects some women after delivery, is characterised by feelings, thoughts and behaviours that are totally out of touch with reality. It is a life-threatening condition.

	LIFE-THREATENING STAGE
SYMPTOMS	Withdrawal from family and friends
	Irrelevant talk
	Crying without provocation
	Refusal to feed the baby
	Auditory and visual hallucinations
	History of harming others
	History of suicidal attempts
SIGNS	Injury marks suggestive of suicidal attempts
TEST RESULTS	Normal CT scan (no lesion in the brain)

CO-MORBID RISKS

16. DOMESTIC VIOLENCE

Domestic violence refers to behaviour by an intimate partner or ex-partner or other relatives that causes physical, psychological or sexual harm to the woman, including physical aggression, sexual coercion, psychological abuse and controlling behaviours³.

SYMPTOMS

Woman not interested in talking or eating

History of suicidal thoughts or attempts to commit suicide

History of name calling, beating and/or forced sex

Woman being prevented from meeting her family and friends

SIGNS

Irregular ANC visits

Woman not gaining weight since the last ANC visit

Injury marks / bruises



³ Acts of physical violence include slapping, hitting, kicking and beating. Sexual violence includes forced sexual intercourse and other forms of sexual coercion. Psychological abuse includes insults, belittling, constant humiliation, intimidation, threats of harm, threats to take away children. Controlling behaviours include isolating a woman from her family and friends, monitoring her movements, and restricting access to financial resources, employment, education or medical care.

Effect on pregnancy

- Physical violence during pregnancy can cause bruises and injuries. An abdominal injury can result in bleeding and maternal death, depending on the severity of the injury and volume of bleeding. It can also injure the foetus or result in foetal death.
- Psychological violence can cause low self-esteem, anxiety, depression, inability to sleep as well as suicidal thoughts and actual self-harm.
- Sexual violence during pregnancy can increase the risk for STIs, vaginal infections and HIV. Some STIs such as trichomoniasis can cause PROM and preterm labour. Gonococcal and chlamydial infections increase the risk of infertility for the mother, and of life-threatening eye and lung infections for the newborn.
- Any form of violence can cause depression and poor intake of food, which can result in poor weight gain and anaemia in the mother. The consequences of severe anaemia were discussed under cluster 4. Anaemic women are also likely to give birth to low birth weight babies.
- Violence can also result in poor healthcare seeking, which can adversely affect the woman's health during pregnancy.

17. URINARY TRACT INFECTION (UTI)

This is a condition in which bacterial colonies (most commonly that of *E. coli*) infect the urinary tract. In its moderate form, the infection is limited to the lower part of the urinary tract. In its severe form, the infection spreads to the kidneys, which can lead to sepsis.

SYMPTOMS	Burning sensation or pain while urinating
	Increased frequency of urination
	Increased urge but inability to urinate because of pain
	Pain and/or discomfort in the lower abdomen
	Fever
	Chills
	Frequent and severe pain in the flanks
SIGNS	Increased body temperature
	Rapid pulse
TEST RESULTS	Raised WBC count
	Urine microscopy revealing more than 6 pus cells/HPF
	Culture showing growth such as <i>E. coli</i>

Role of pregnancy

As the cells in the urinary tract undergo changes during pregnancy, the urinary tract is susceptible to infections. Also, the growing uterus sits directly on the bladder and hinders complete evacuation of the bladder. This leads to stasis, which makes the pregnant woman more vulnerable to UTIs.

Effect on pregnancy

Severe UTIs that involve the kidneys increase the risk of preterm delivery and low birth weight babies.

18. MALARIA

Malaria is an infectious condition caused by Plasmodium, a protozoan parasite. It is transmitted by mosquito bites.

SYMPTOMS	Fever and flu-like illness
	Shaking chills and sweating
	Headache
	Muscle ache
	Tiredness
	Nausea and vomiting
	Diarrhoea
SIGNS	Increased temperature
	Pallor
	Signs of dehydration
TEST RESULTS	Positive peripheral smear for malarial parasite
	Positive rapid malarial antigen test
	Low Hb levels

Role of pregnancy

As pregnant women have lowered immunity, they are at increased risk for developing infections, including malaria. Pregnant women are more susceptible to plasmodium falciparum infection. Studies have shown that prevalence of infection is highest during the second gravida.

Effect on pregnancy

Malaria in pregnancy puts the woman at increased risk for complications like anaemia, abortion, premature delivery, stillbirth and low birth weight babies.

19. TUBERCULOSIS

TB is an infectious disease, caused by bacteria, that most commonly affects the lungs. The symptoms, signs and test results listed below pertain to pulmonary TB. Extra-pulmonary TB that affects the fallopian tubes, bones and joints is not discussed in this handbook.

SYMPTOMS

Persistent cough for 2-3 weeks, intensifying in the morning and sometimes accompanied with blood

Night sweat with fever

Weight loss

Loss of appetite

Breathlessness

Chest pain

Weakness and tiredness

SIGNS

Possibly decreased air entry on auscultation

TEST RESULTS

Positive sputum test for AFB (acid fast bacilli)

Positive Mantoux Test (more than 10 mm)

Chest X-ray showing patchy consolidations

Role of pregnancy

- The role played by pregnancy in increasing a woman's susceptibility to TB, or influencing disease progression has not been clearly documented. However, it is possible that the lowering of immunity during pregnancy can make a woman susceptible.
- Frequent pregnancies may serve to re-activate latent TB.
- As opportunistic infections progress quickly during pregnancy, TB with HIV co-infection progresses quickly too. The prognosis is particularly poor when TB is diagnosed at an advanced stage during puerperium.

Effect on pregnancy

- TB puts the woman at risk for spontaneous abortion, poor weight gain in pregnancy and preterm delivery.
- It also increases the risk of a low birth weight baby and neonatal mortality.

20. SEXUALLY TRANSMITTED INFECTIONS (STIs)

STIs are inflammations of the reproductive tract, caused by bacterial, viral or parasitic infections. STIs are grouped into syndromes, based on their symptoms: (A) Discharge-causing syndrome; (B) Non-herpetic ulcerative syndrome; (C) Herpetic ulcerative syndrome and (D) Lower abdominal pain syndrome.

Diagnosis using a syndrome approach is based on symptoms. Test results are not essential for a diagnosis. Some tests may not even be available at peripheral centres. However, test results improve the accuracy of a syndrome based diagnosis.

(A) DISCHARGE-CAUSING SYNDROME:

This is of two types: (A1) Those that affect only the vagina (vaginitis) and (A2) those that affect even the cervix (cervicitis)

(A1) Vaginitis is caused by i) trichomoniasis, ii) candida vaginitis and iii) bacterial vaginosis.

i) Trichomoniasis or Tric, caused by protozoan *Trichomonas vaginalis*, is characterised by the following indications:

SYMPTOMS

Vaginal discharge

Genital itching

SIGNS

Watery and frothy discharge

“Strawberry cervix” characterised by punctate haemorrhagic spots

TEST RESULTS

Positive wet mount in saline showing motile *Trichomonas*

Positive Pouch test

ii) Candida vaginitis, also known as vaginal thrush, is caused by excessive growth of *Candida*, a type of yeast. It is a discharge-causing infection. It is not a STI, but is usually found associated with other STIs. It is, therefore, classified within the discharge-causing syndrome.

SYMPTOMS

Vaginal discharge

Genital itching

SIGNS

Curd-like vaginal discharge

Haemorrhagic spots on peeling of the curd-like discharge on the vagina

TEST RESULTS

Gram's stain / pap smear for hyphae of *Candida*

iii) Bacterial vaginosis is another discharge-causing non-STI, but usually found along with other STIs. It is caused by excessive growth of many bacteria, dominated by *Gardnerella vaginalis*.

SYMPTOMS

Vaginal discharge

Genital itching

SIGNS

Vaginal discharge with fishy odour

Haemorrhagic spots on peeling of the curd-like discharge on the vagina

TEST RESULTS

Demonstration of clue cells on saline.

(A2) Cervicitis is usually caused by gonorrhoea and chlamydia.

Gonorrhoea and chlamydia, caused by the bacteria *Neisseria gonococcus* and *Chlamydia trachomatis* respectively, are mostly asymptomatic STIs. Although these STIs may have manifesting symptoms, they are usually identified in routine examinations. They affect the cervix, causing cervicitis. In their severe form, they cause pelvic inflammation (see “lower abdominal pain syndrome” below).

SYMPTOMS

Vaginal discharge

Genital itching

SIGNS

Inflamed cervix with muco-purulent discharge

TEST RESULTS

Positive microscopic examination of the urine or cervical swab

(B) NON-HERPETIC ULCERATIVE SYNDROME is caused by syphilis and chancroid.

Syphilis is caused by the bacterium *Treponema pallidum*

SYMPTOMS

Single painless ulcer in the genital area

Itching

SIGNS

Single, firm, non-tender ulcer (chancre)

Lymphadenopathy

TEST RESULTS

Detection of *T pallidum* by microscopic examination of fluid or smears from lesions

Chancroid is caused by the bacterium *Haemophilus ducreyi*.

SYMPTOMS

Multiple painful ulcers in the genital area

Itching in the genital area

SIGNS

Tender ulcers with bleeding floors that may either be sharply defined or have irregular borders

Painful lymphadenopathy

TEST RESULTS

Tests for syphilis and herpes simplex virus are negative

(C) HERPETIC ULCERATIVE SYNDROME, caused by the *Herpes simplex virus*, is also a form of ulcerative STI, but is treated separately from non-herpetic ulcerative syndrome.

SYMPTOMS

Tingling and numbness in the genital area

Multiple small water-filled painful blebs in clusters

Ulcers

SIGNS

Tender shallow ulcers

Lymphadenopathy

TEST RESULTS

Direct tests for viral isolation and the detection of antigen

(D) LOWER ABDOMINAL PAIN SYNDROME: As explained earlier (under cervicitis), lower abdominal pain syndrome is caused by Gonorrhoea and Chlamydia. The pain is usually due to inflammations in uterus fallopian tubes. While treating this, the anaerobic infections are also considered together.

SYMPTOMS	Lower abdominal pain
	Difficult or painful sexual intercourse
	Vaginal discharge
	Fever
	Nausea
	Vomiting
SIGNS	Tender lower abdomen
	Cervical motion tenderness (tenderness on moving the cervix on vaginal examination)
TEST RESULTS	Positive microscopic examination of the urine or cervical swab.

Role of pregnancy

- Pregnancy is not known to affect a woman’s vulnerability to STIs or progression of these infections in any specific way. However, the lowered status of immunity in pregnancy may have a role to play, especially if the woman also has HIV.

Effect on pregnancy

- Syphilis can spread to the baby, causing congenital syphilis. Untreated infants that survive tend to develop problems in multiple organs, including the brain, eyes, ears, heart, skin, teeth and bones.
- Trichomoniasis results in preterm labour and PROM.

- Gonorrhoea and chlamydia increase a woman’s risk for pelvic inflammatory disease, infertility and ectopic pregnancy. They also increase the risk of life-threatening eye infections and pneumonia in the newborn.

21. HIV INFECTION

This condition is characterised by decreased immunity. Although it is mostly asymptomatic and identified only through a routine test, it may present with symptoms. It is transmitted through body fluids.

SYMPTOMS	A history of STI
	Weight loss
	Diarrhoea
TEST RESULTS	Positive results for Rapid tests, ELISA and Western blot

Role of pregnancy

- Lowered immunity during pregnancy may make a woman with HIV more susceptible to infections.

Effect on pregnancy

- Women infected with HIV are more susceptible to infections (e.g., bacterial pneumonia, UTI, oral and vaginal thrush) and post-surgical complications.
- HIV positive women are likely to have more severe obstetric morbidities such as ectopic pregnancies, early abortion, severe anaemia (especially if there is malarial co-infection).
- There is a risk of transmission to the baby during pregnancy, delivery or breastfeeding.

22. HEPATITIS B AND C

Hepatitis B and C are infectious diseases of the liver, caused by the viruses Hepatitis B and C respectively. They are transmitted through body fluids. These infections can compromise the liver (both acutely and chronically) and lead to cirrhosis, liver cancer and even death.

SYMPTOMS	Low-grade fever
	Nausea
	Loss of appetite
	Malaise
SIGNS	Jaundice
	Enlarged liver
TEST RESULTS	HBsAg test positive for hepatitis B
	HCV (Hepatitis C virus) test positive for hepatitis C

Effect on pregnancy

- Women infected with hepatitis B or C may have premature delivery, cirrhosis of the liver and liver cancer.
- There is a risk of transmission from mother to child during pregnancy, delivery or breastfeeding. Infected foetuses may die before delivery. Infants infected at birth have a 90 per cent chance of becoming chronically infected.

23. TORCH INFECTIONS

This is a group of infections that can be passed on to the foetus from the mother and are therefore called “vertically transmittable infections”. The acronym “TORCH” refers to:

- T Toxoplasmosis
- O Others (hepatitis B, C and syphilis) [refer to the conditions 20 and 22]
- R Rubella
- C Cytomegalovirus infection
- H Herpes simplex infection [refer to Herpetic Syndrome under Condition 20]

Toxoplasmosis, an infectious disease caused by the protozoan *Toxoplasma gondii*, is usually asymptomatic. However, in people with immunodeficiency, Toxoplasmosis may affect the skin, brain, eyes and other organs. It is commonly acquired through contact with infected animals, usually cats.

SYMPTOMS	Flu-like symptoms
	Muscle ache
SIGNS	Swollen posterior cervical lymph node
TEST RESULTS	Positive IgM antibody against Toxoplasma

Rubella infection, an infection caused by the rubella virus is also known as “German measles”.

SYMPTOMS	Rash spreading from the face to the body
	Low grade fever
	Muscle ache

	Joint pains
	Loss of appetite
	Headache
	Sore throat
SIGNS	Swollen glands
TEST RESULTS	Positive IgM antibody against rubella virus

Cytomegalovirus infection, an infection caused by human cytomegalovirus.

SYMPTOMS	Sore throat
	Fever
	Body ache
	Tiredness
SIGNS	Hepatomegaly
TEST RESULTS	Positive IgM antibody against cytomegalovirus

Role of pregnancy

- These infections can be passed on to the foetus from the mother and are, therefore, termed “vertically transmittable infections”.

- Pregnancy may increase the severity of herpes simplex infection, but is not known to affect other infections in this group.

Effect on pregnancy

Toxoplasmosis

- Toxoplasmosis increases the risk for miscarriage, intrauterine growth restriction (IUGR), as well as premature labour and delivery.
- The effect on an infected neonate can be neurological, ophthalmological and cognitive, as the child born is at increased risk of developing hydranencephaly and microcephaly.

The effects of syphilis, hepatitis B and C were described in sections 20 and 22.

Rubella

- Women infected with rubella are more likely to miscarry and have a stillbirth than non-infected women.
- If a pregnant woman gets infected during the first five months of pregnancy, she usually passes the disease on to her foetus.
 - A foetus infected within the first 12 weeks of pregnancy is likely to be born with eye problems (cataract, glaucoma, retinopathy), hearing loss and heart defects. These neonates with congenital rubella syndrome run the risk of developing other birth defects (e.g., mental retardation, movement disorders) and diabetes during childhood or later.
 - A foetus infected during the 12th to 20th week of pregnancy, usually inherits milder problems or none at all.
 - Some infected babies have short-term health problems, such as low birth weight, diarrhoea, feeding problems, pneumonia, meningitis, anaemia, an enlarged spleen and liver, red/purple spots on their faces and bodies.

Cytomegalovirus infection

- There are no serious implications of this infection for the mother.
- The baby may have IUGR, microcephaly, abnormalities of the central nervous system, hydrocephaly, deafness, blindness, and mental retardation.

Herpes simplex virus infection

- Infected neonates may have lesions in the skin, mouth or eye with potential permanent damage to the nerves or eyes.
- Herpes simplex virus in the newborn often spreads to the brain and other internal organs. About 50 per cent of the survivors develop mental retardation, cerebral palsy, seizures, blindness or deafness.

24. THYROID PROBLEMS

The thyroid gland (an endocrine gland situated in the neck) produces thyroid hormones, which affect the growth and metabolism of the body. Hypothyroidism is a state in which the levels of thyroid hormones are lower than normal. In hyperthyroidism, the levels are higher than normal.

Hypothyroidism

SYMPTOMS

Tiredness

Constipation

Weight gain

Breathlessness

Hoarse voice

Intolerance to cold

SIGNS

Dry skin

Cool extremities

Fluid collection in the limbs and body cavities

Reduced heart rate

TEST RESULTS

Reduced total thyroxine level

Normal or increased TSH levels

Hyperthyroidism

The diagnosis of hyperthyroidism must be cautiously made since pregnancy is, by itself, a hyperthyroid state.

SYMPTOMS

Increased appetite

Tremors

Muscle weakness

Weight loss

Heat intolerance

Diarrhoea

Tension and nervousness

Palpitations

SIGNS

Bulging eyes

Increased heart rate and abnormal heart rhythm

Increased BP

TEST RESULTS

Abnormally high levels of T3 and T4

Decreased levels of TSH

Role of pregnancy

Two hormones produced during pregnancy (human chorionic gonadotropin or hCG and oestrogen) give rise to higher than normal levels of thyroid hormone in the blood.

Effect on pregnancy

Hypothyroidism: Uncontrolled hypothyroidism increases the risk of PIH, anaemia, miscarriage, stillbirth, low birth weight and, in rare instances, congestive heart failure.

Hyperthyroidism: Uncontrolled hyperthyroidism increases the risk of congestive heart failure, PIH, thyroid storm (a sudden and severe worsening of the symptoms of hyperthyroidism), miscarriage, premature delivery and low birth weight.

25. DIABETES

This condition refers to diabetes that existed before pregnancy and is not induced by pregnancy⁴. Diabetes may be asymptomatic but identified through a routine laboratory test. Diabetes in pregnancy is commonly associated with Candida infections and hydramnios.

SYMPTOMS

Increase in appetite

Frequent urination

Excessive thirst

Feeling tired all day

Frequent infections

Poor wound healing

High irritability / depression

Blurred vision

Loss of consciousness

⁴ Diabetes that develops during pregnancy is termed gestational diabetes. Both gestational and chronic diabetes are manifested through the same set of symptoms, tests and test results. Therefore, gestational diabetes has not been considered separately in this handbook.

TEST RESULTS

FBS > 126 mg%

PPBS or RBS > 200 mg%

Glycated Hb (HbA1C) > 6

Role of pregnancy

Hormones produced during pregnancy (human chorionic gonadotropin or hCG and human placental lactogen or hPL) increase blood sugar level, and thereby exacerbate pre-existing diabetes.

Effect on pregnancy

- Diabetes increases the mother's risk for developing PIH.
- Diabetes can lead to poor birth outcomes. It increases the risk of miscarriage and birth defects. It also increases the risk of stillbirth and death of the newborn.
- Increased blood sugar levels make the foetus develop into a larger than average baby (macrosomia). This, in turn, causes problems for the mother during labour. Women with diabetes often require to be delivered via Caesarean section.
- The baby born is likely to develop hypoglycaemia immediately after birth.
- Diabetes increases the risk of jaundice and respiratory distress syndrome in the newborn. It also puts the baby at higher risk for obesity and Type 2 diabetes later in life.

26. CHRONIC HYPERTENSION

This condition refers to hypertension that is not induced by pregnancy. Chronic hypertension refers to high BP (140/90 mmHg or higher) before a woman completes 20 weeks of pregnancy. It should be differentiated from PIH, in which a woman with no history of hypertension develops high BP after 20 weeks of pregnancy.

SYMPTOMS

Giddiness

Headache

Swelling of feet that does not reduce with rest

SIGNS

BP of 140/90 or more before the 20th week of pregnancy

Role of pregnancy

Pregnancy is not known to affect chronic hypertension in any specific way. The variations in BP that normally occur between the first and third trimesters of pregnancy are also seen among pregnant women with chronic hypertension.

Effect on pregnancy

In addition to accelerated hypertension in the third trimester, pregnant women with chronic hypertension are at an increased risk of super-imposed PIH, IUGR, placental abruption, premature delivery and stillbirth.

27. HEART DISEASE

Heart disease refers to any condition in which the functioning of the heart of a pregnant woman is compromised. Most commonly, it includes congenital heart diseases or valvular heart diseases caused by rheumatic heart disease.

SYMPTOMS	Tiredness
	Breathlessness
	Palpitations
SIGNS	Pitting pedal edema
	Signs of heart failure (hepatomegaly, raised jugular venous pressure, basal crepitations etc.)
	Cardiac murmurs
TEST RESULTS	Echocardiogram showing an abnormality

Interaction between pregnancy and heart disease

- As blood volume, cardiac output and heart rate increase in pregnancy, the symptoms of heart diseases like mitral stenosis may worsen. Given this, a pregnant woman will be at an increased risk for dyspnoea, decreased exercise capacity, orthopnoea, paroxysmal nocturnal dyspnoea and pulmonary oedema.
- Women with valvular heart diseases are at increased risk for endocarditis in pregnancy. Those who have undergone valvular replacement are at higher risk for clotting at the heart valves, since pregnancy is a state of increased coagulability that complicates their post-surgery (anticoagulant) treatment.

CHAPTER 4

HOW TO ANALYSE OVERLAPPING SYMPTOMS OF RISK

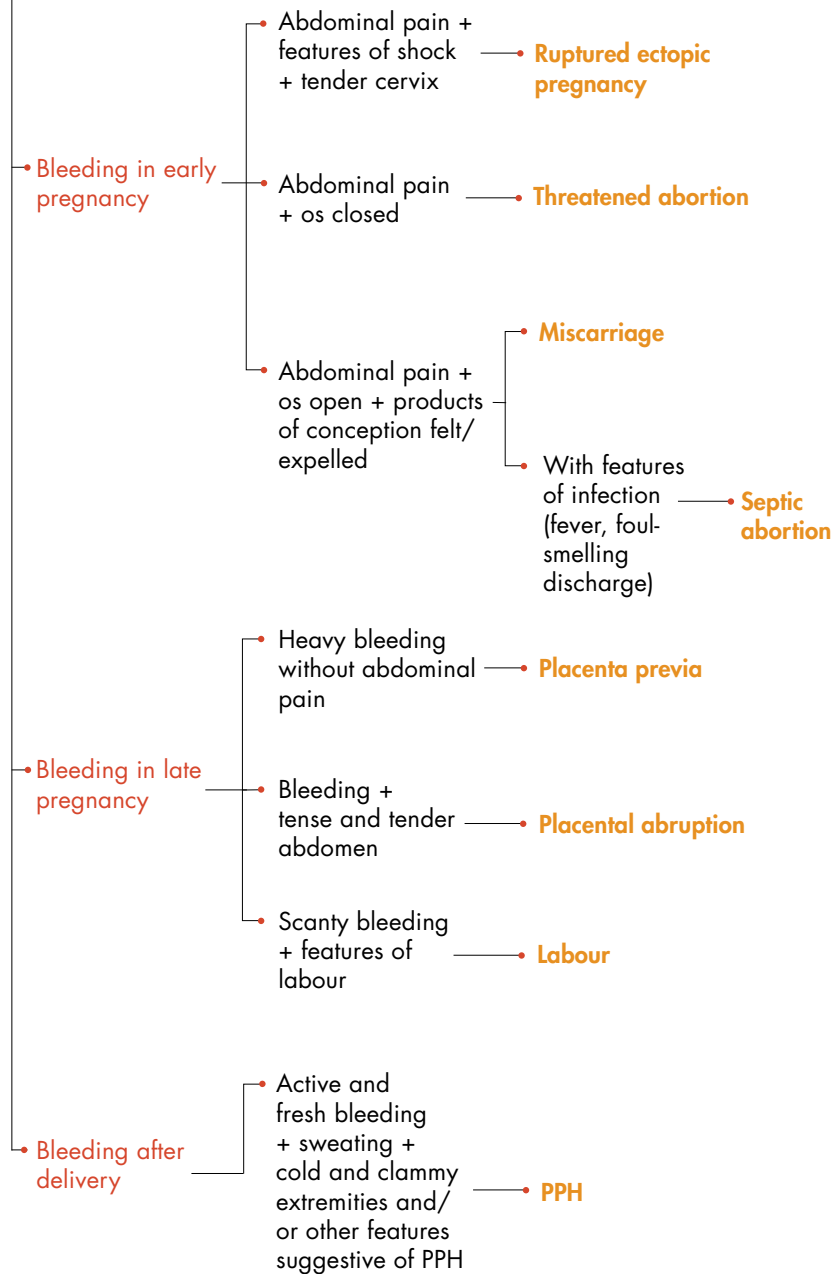
What is a doctor and staff nurse to do when they come across symptoms such as swelling of the lower limbs and fever that are common to different risk conditions? Overlapping symptoms can make the diagnosis of risks a tricky business.

In this chapter, we focus on seven commonly reported symptoms that can challenge a doctor and staff nurse because they belong to multiple clusters. These are bleeding, abdominal pain, swelling of the lower limbs, headache, fever, breathlessness and altered behaviour.

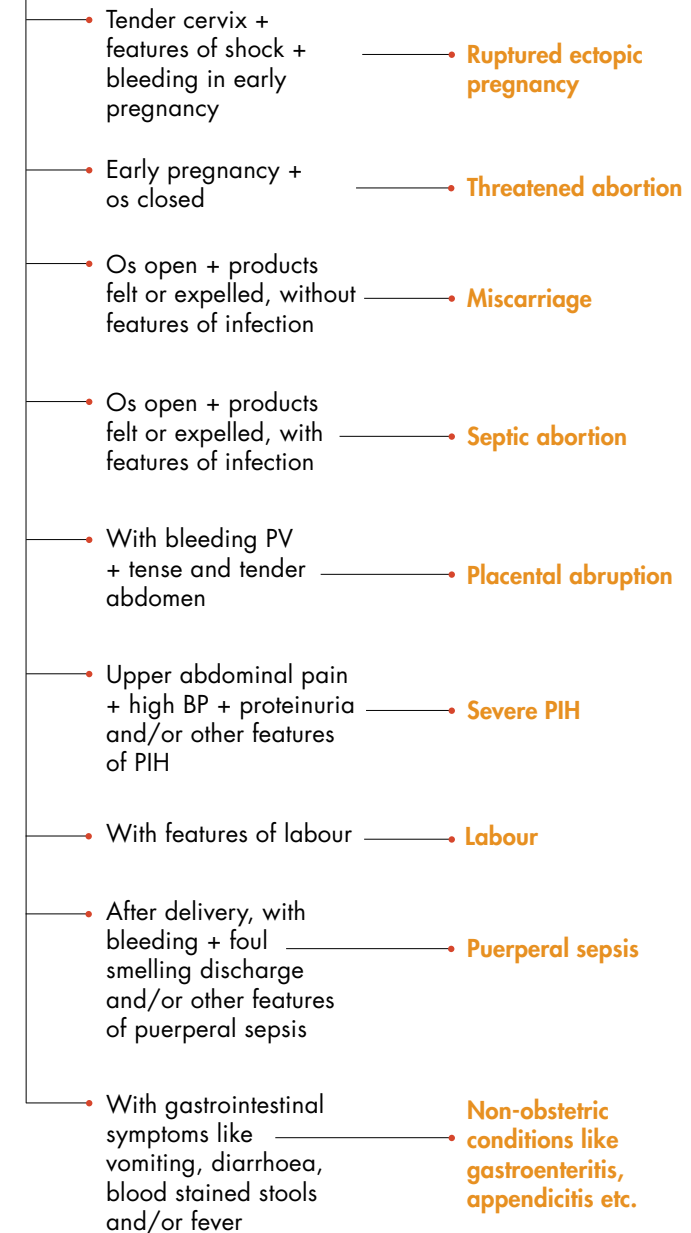
Using flow charts, we map out the different risk clusters to which each of the seven symptoms could potentially belong. Since risk conditions can be manifested in atypical ways, we cannot presume that the doctor and staff nurse conducting a clinical evaluation will encounter associated symptoms, signs and test results in a pre-determined sequence. Given this, the flow charts are brief and indicative. They are not diagnostic algorithms that can be routinely applied to analyse risk.



• BLEEDING



• ABDOMINAL PAIN



• SWELLING OF THE LOWER LIMBS

- Reduces after rest for 8-10 hours —→ **Normal**
- Does not reduce after rest for 8-10 hours
 - With high BP + proteinuria and/or other features of PIH —→ **PIH**
 - With tiredness + pallor + Hb below 11g% and/or other features of anaemia —→ **Anaemia**
 - Painful and can be in single limb —→ **DVT (deep vein thrombosis)**

• HEADACHE

- With high BP + proteinuria and/or other features suggestive of PIH —→ **Severe PIH**
- With fever + altered behaviour + stroke-like findings and/or other such features suggestive of CVT —→ **CVT**
- Intense throbbing pain + nausea and vomiting —→ **Migraine**
- Pressure around the eyes + fever + nasal discharge + sore throat —→ **Sinusitis**
- Moderate pain around the temples —→ **Tension headache**

• FEVER

- Close to delivery, with leaking PV for more than 18-24 hours —→ **PROM with infection (chorio amnionitis)**
- Headache + irrelevant behaviour + stroke like findings and/or other such features suggestive of CVT —→ **CVT**
- After delivery or abortion, with foul smelling discharge + abdominal discomfort and/or features of sepsis —→ **Puerperal sepsis / septic abortion**
- After delivery, with pain, swelling, redness in the breast —→ **Mastitis / breast abscess**
- With sore throat + dry cough + tiredness + mild headaches or muscle aches —→ **Upper respiratory tract infection**
- With cough + breathlessness + chest pain —→ **Lower respiratory tract infection**
- With vomiting/diarrhoea + abdominal pain —→ **Gastroenteritis**
- With weight loss + swollen lymph nodes + night sweats and/or other features of TB —→ **Pulmonary TB**
- Intermittent fever + chills + night sweats + headache + vomiting/ diarrhoea —→ **Malaria**
- With burning and/or frequent micturition and/or other features of UTI —→ **UTI**

CHAPTER 5

PRINCIPLES OF MANAGEMENT

In this chapter, we outline some general principles for managing the risk conditions described in Chapter 3, without going into technical details. We do not replicate the management protocols and standard treatment guidelines that have been developed by technical teams, both nationally and internationally. These can be freely downloaded from the Internet. A reader wishing to know more, can look at the references and web links listed at the end of the handbook.



MANAGING RISKS: ESSENTIAL STEPS

Once a pregnant woman is identified with any risk, determine her management by following the steps listed below.

1. Identify if she needs emergency care and treatment. Either way, take necessary steps to manage her risk.



2. If she does need emergency care, admit her immediately.
 - Stabilise her by securing an IV line and administering appropriate IV fluids.
 - Put her on oxygen, if required.
 - Monitor her vital parameters (temperature, pulse, respiration, BP and urine output).
 - Check for foetal heart sounds.
 - Keep her in a left lateral position and begin treatment.

cont. >>

• BREATHLESSNESS

- With tiredness + pallor + Hb of under 7 g% and/or other features of severe anaemia → **Severe anaemia with or without heart failure**
- With high BP + proteinuria and/or other features suggestive of PIH → **Severe PIH (with pulmonary oedema)**
- With fever + jaundice + reduced urine output and/or other features suggestive of sepsis → **Puerperal sepsis**
- With cardiac murmurs + history of heart disease and/or other features suggestive of heart disease → **Heart disease in pregnancy**
- With fever + cough and/or chest pain → **Lower respiratory tract infections**

• ALTERED BEHAVIOUR

- With fever + jaundice + reduced urine output and/or other features suggestive of sepsis → **Puerperal sepsis**
- With fever + headache + stroke-like findings and or other such features suggestive of CVT → **CVT**
- With hallucinations + disinterest in the baby and oneself and/or other such psychotic symptoms → **Puerperal psychosis**

3. If the demand for emergency care is greater than the capacity to respond:
 - Conduct a preliminary clinical assessment of all the women.
 - Start treating the woman with the most severe symptoms before attending to the other women.
4. If, for any reason, treatment is not possible at your facility, stabilise and refer the woman to an appropriate higher facility.
 - Contact the doctor at the higher facility and apprise him/her of the woman's condition.
 - Explain why a referral is necessary.
5. On the woman's return from the referral hospital:
 - Follow up by re-assessing her risk factors and verifying if they are under control.
 - Manage her risk by following the treatment determined by the doctor in the referral hospital.
6. Identify and address the social and/or familial contributors to the woman's risk to assure safety of the current (and future) pregnancies.
 - Tackle adverse belief systems (see Chapter 6).
 - Identify the lack of support and care for the woman, and counsel her family, if these are inadequate.
 - Be alert to the symptoms and signs of violence by her spouse and/or relatives, and take stern action.
 - Help women who have to migrate for work understand why they must carry their ANC cards with them, and continue receiving ANC services.
7. Help the family draw up a birth plan, including an emergency backup plan. The plan should include:
 - A financial plan to cover basic and emergency care.
 - A logistical plan covering (a) transport, (b) childcare at home, (c) care giving at the hospital, and (d) referral to a higher facility.

MANAGING OBSTETRIC RISKS: BASIC PRINCIPLES

1. HYPEREMESIS GRAVIDARUM

The primary objectives of management are:

- (1) to prevent further dehydration
 - (2) to rehydrate the woman.
- Give her **anti-emetic and antacid drugs**. Withhold all medications that aggravate vomiting, such as iron or antibiotics.
 - If the woman is unable to retain any oral food, stop oral intake and rehydrate her with **intravenous fluids**.

2. THREATENED ABORTION/MISCARRIAGE

Any bleeding in pregnancy during the first two trimesters should be assessed and managed for a potential miscarriage, depending on whether the miscarriage is imminent (threatened) or has actually taken place.

ABORTION/MISCARRIAGE

THREATENED

(as indicated by a closed os on examination and a viable foetal heart through a scan)

Preserve the pregnancy through a supportive conservative approach: **bed rest and observation**. However, there is no definitive treatment to preserve the pregnancy.

INEVITABLE

(as indicated by heavy bleeding with an open os/no viable foetal heart)

Ensure safe and complete expulsion of the foetus through **medication (misoprostol) or a minor intervention** with suction dilatation and curettage.

Note: Progesterone medication does not prevent an abortion.

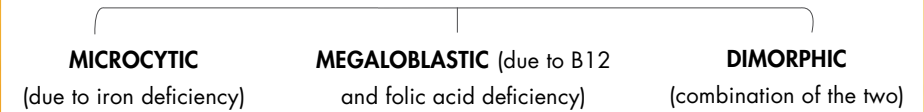
3. ECTOPIC PREGNANCY

Ectopic pregnancy can become a life-threatening obstetric emergency if it is not properly diagnosed and managed. An ectopic pregnancy can be terminated either medically and surgically. The choice of method depends on the **size and state of the tubal ectopic mass**.

- If the size of the mass is **smaller than 3.5 cm**, and there is **no evidence of intra-abdominal bleeding or rupture**, then terminate the ectopic pregnancy medically using **methotrexate**.
- If the size of the mass is **larger than 3.5 cm** or there is any **evidence of rupture**, then terminate the ectopic pregnancy through an **emergency surgery**.

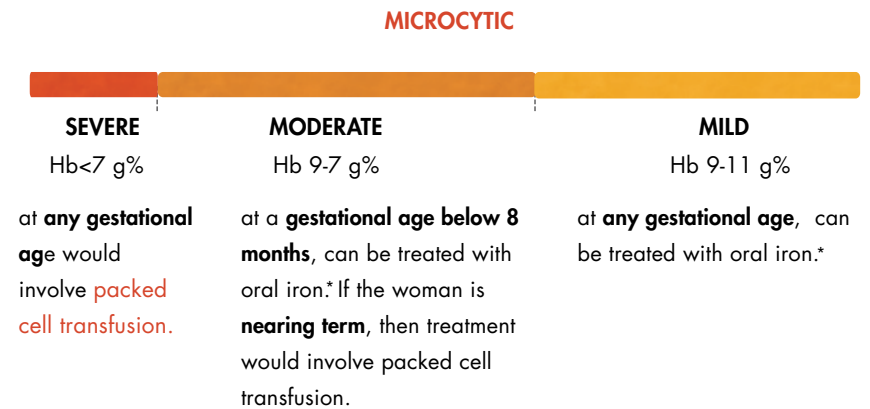
4. ANAEMIA

(1) Identify what **type of anaemia** a woman has:



Therefore, the healthcare provider should consider treating anaemia with **iron and/or B12 and folic acid** (as per the protocol).

(2) In case of iron deficiency anaemia, treatment would depend on 2 parameters: **severity of the anaemia (level of Hb)** and **gestational age**.



*In case of non-compliance or intolerance to oral iron, **iron injections** should be administered as per the protocol.

Due to the high prevalence of anaemia and the increased requirement for iron during pregnancy, all pregnant women should be given **IFA tablets (as per the protocol)**, even if they have normal Hb levels.

5. PREGNANCY-INDUCED HYPERTENSION

PIH



MILD

- The primary objective of management is to **prevent eclampsia** with the use of **anti-hypertensives**.
- Ask the woman to visit the doctor at more frequent intervals than would be necessary if she was risk-free. During these visits, **monitor her BP and proteinuria** to assess her status and take clinical decisions about management.
- Persuade the woman's family to give her time to **rest (in a left lateral position)** for a couple of hours during the day.
- Counsel the woman and her family to **recognise warning signs of severe PIH (imminent eclampsia and eclampsia)** and seek **emergency care**. Provide them with information about the facilities to be approached in an emergency and the transport options available.

SEVERE

- As part of general management, keep the woman in the left lateral position. **Give her oxygen. Monitor her urine output.**
- **Administer anti-hypertensive drugs** (like oral nifedipine or IV labatolol).
- **Administer anti-convulsant drug MgSO₄ (magnesium sulphate)**, even if the woman has no history of convulsions or is being referred to a higher facility for treatment.
- As part of obstetric management, **terminate her pregnancy** either by vaginal delivery or Caesarean section. The choice of delivery would depend on gestational age of the foetus, favourability of the cervix, and the presence/absence of IUGR.

6. INTRAUTERINE DEATH

The objectives of management are:

- (1) to terminate the pregnancy with minimal harm to the mother
- (2) to manage her psychological concerns.

There are three components to management:

Termination

- Induce and augment labour with **oxytocin**.
- Avoid a Caesarean section, as the foetus is dead.

Caution

- Watch for **coagulation failure and infection**.
- Treat the woman if these conditions emerge.

Counselling

- Explain the condition to the woman and provide psychological support.

7. ABRUPTIO PLACENTAE (PLACENTAL ABRUPTION)

The primary goals of management are:

- (1) to stabilise the woman, and
 - (2) to deliver the (live/dead) baby appropriately. The choice of delivery depends on the condition of the woman and the foetus.
- First, stabilise the woman and monitor the foetus.
 - If the woman is stable and the **foetus is dead**, consider a **vaginal delivery**.
 - If woman is stable and the **foetus is not compromised**, consider the possibility of a **Caesarean section**. Such a delivery can get complicated due to the loss of blood and the risk of coagulation failure. Given this, a primary care health provider is advised to stabilise the woman and refer her to a higher facility.

8. PLACENTA PREVIA

Placenta previa can become a **life-threatening obstetric emergency if it is not properly diagnosed and managed**. A woman with placenta previa is likely to have APH and preterm delivery. Given this, steps must be taken to obtain and transfuse cross-matched blood, if and when the need arises.

If placenta previa is suspected, then a **PV examination must not be conducted**.

PLACENTA PREVIA

No bleeding

+ no contractions
+ foetus is fine

Conservative management:
Wait until foetal maturity;
advise bed rest; monitor
the woman and the foetus

Scanty bleeding/spotting

+ placental edge further
than 20 mm from the os in
a 9th month scan

Attempt a **vaginal delivery**

Heavy bleeding +

contractions/ placental
edge less than 20 mm
from the os

Conduct a **Caesarean
section** or refer the
woman to a higher
centre for one

9. PREMATURE RUPTURE OF MEMBRANES

- Confirm **suspected PROM** by conducting a **speculum examination**.



- If there is any indication of **infection** (like fever or foul-smelling discharge), start the woman on a course of **antibiotics**.



- Confirm **foetal maturity** and **amniotic fluid index** by arranging for a **USG**.



- If foetal maturity corresponds to a **gestational age under 34 weeks**, then give the woman the required **corticosteroids** to accelerate lung maturity of the foetus.



- If the **amniotic fluid index** is **higher than 5**, then a **vaginal delivery** can be attempted with a realistic backup plan for a Caesarean section.



- If the **amniotic fluid index** is **lower than 5**, arrange for the woman to deliver via **Caesarean section**.

10. POSTPARTUM HAEMORRHAGE

MANAGEMENT

GENERAL MANAGEMENT

- Provide **fluid resuscitation, volume replacement** (crystalloid/colloid/blood transfusion) and **warmth**
- Keep the **foot end elevated**
- **Massage the uterus**

SPECIFIC MANAGEMENT

(depends on the cause for PPH.)

- **If the PPH is due to a tear either in the vagina or cervix**, then **secure the trauma** immediately.
- **If the PPH is due to retained placental bits**, then refer her to a higher centre where the retained tissue can be removed via **oxytocin** and, if needed, **evacuation**.
- **If the PPH is due to atonic uterus**, **massage the uterus** and administer **uterotonics** (oxytocin, methargin or prostaglandin).
- If specific management of the type mentioned above does not arrest the bleeding, then **refer the woman immediately** to a **higher centre** after stabilising her and giving her a **uterovaginal/pelvic pressure pack**.

11. PUERPERAL SEPSIS OR SEPTIC ABORTION

MANAGEMENT

GENERAL MANAGEMENT

- Keep the woman **adequately hydrated** and **nourished**.

SPECIFIC MANAGEMENT

- Administer appropriate **antibiotics**.
- **Remove** the source of **infection**, if any (e.g., products of conception in case of septic abortion).

TREATMENT OF CO-MORBID CONDITIONS

- Evaluate and **treat co-morbid conditions** such as anaemia, electrolyte imbalance, renal failure.



12. CEREBRAL (CORTICAL) VENOUS THROMBOSIS

The approach to managing CVT is largely supportive. Decisions about treatment depend on the **location and size of the clot**. Specific treatment consisting of **thrombolysis with heparin** and the **administration of anti-convulsants** may improve a woman's prognosis.


13. MASTITIS

- Manage mastitis with **antibiotics and pain medications**, unless it is complicated by a **breast abscess**.
- Advise the woman to feed the baby before she takes her medication and express and discard the milk for the next six hours. When the baby needs to be fed during this time, she must consider **alternative feeds**.
- As one of the most common causes for mastitis/breast abscess is **incorrect method of breastfeeding**, help the woman understand how she must breastfeed her child. That is, she should hold the baby in such a position that the baby's mouth covers the entire areola.
- If mastitis has led to a **breast abscess**, arrange for an **incision and drainage** followed by **a course of antibiotics**. The choice of antibiotic would depend on a culture and sensitivity analysis.

14. POSTPARTUM DEPRESSION

- Educate the woman and her family about the illness. Alleviate their fear of stigma associated with a **"psychiatric condition"**.

- **Refer her to a psychiatrist** for a **clinical evaluation, counselling and anti-depressant medication**, as appropriate.

- Follow up by assessing the woman's functionality, and clearly tackling the misconceptions that often prompt family members to seek care from an unqualified provider instead of a professional doctor.

15. POSTPARTUM PSYCHOSIS

- **Confirm the diagnosis** of postpartum psychosis only after the organic lesions associated with CVT and sepsis are ruled out.

- Once the diagnosis is confirmed, manage psychosis in the same way as postpartum depression, except for the choice of drugs (**anti-psychotics** rather than anti-depressants). Start treatment immediately, as the woman will have tendencies to harm herself and others.

MANAGING CO-MORBID RISKS: BASIC PRINCIPLES

16. DOMESTIC VIOLENCE

The management of domestic violence has five components.

Clinical management

- Treat the lacerations, bruises, fractures and other injuries, if any.

Documentation

- Record the physical injuries/mental health issues in detail. This will help the woman if/when she takes legal assistance or applies for a separation.

Education

- Educate the woman about domestic violence by talking about the
 - adverse health effects on her and the child
 - provisions under the Protection of Women against Domestic Violence Act in 2005
 - availability of shelters, NGOs, protection officers, doctors, police or the magistrate, and the assistance that she can hope to get from each of them.

Safety planning

- Help the woman understand why it is in her best interest to develop a safety plan and how she can do so. This includes keeping money handy, asking her relatives and friends to provide or help her move to a safe place, if and when needed.

Referral

- Refer the woman to appropriate support/shelter services.

17. URINARY TRACT INFECTION

UTI in pregnancy can be symptomatic or asymptomatic. Asymptomatic UTI is usually revealed in a routine urine examination. Either way, UTI must be managed using three approaches:

- (1) general measures
- (2) specific measures
- (3) management of complications

GENERAL MEASURES

- **Fluids:** Recommend plenty of **oral fluids** (about 8-10 glasses of water a day) to **flush out the bacteria**.
- **Hygiene:** Advise the woman to (1) **urinate after sex** (to flush out bacteria); and (2) **clean the anal area** from **front to back** after passing stools (to **avoid cross infection**).
- **Moisture:** Advise the woman to (1) use **cotton underwear** (to keep the perineal area dry and thereby **prevent bacterial growth**), and (2) **wipe the perineal area** with a clean dry cloth from front to back after urination.
- Advise her to **relieve herself whenever she has the urge to urinate**, instead of postponing or limiting her visits to the toilet.

SPECIFIC MEASURES

- Select an appropriate **antibiotic** depending on the **urine culture and sensitivity reports**.
- Make the woman understand that she must take the full course of antibiotics if she is to get well.

MANAGEMENT OF COMPLICATIONS

- If there is evidence of complications like **pyelonephritis**, then the woman requires intensive management at a **higher facility**.

18. MALARIA

The **primary mode of treatment** is through **anti-malarial drugs**. The choice of drug depends on the infective strain of malaria and gestational age.

INFECTION

UNCOMPLICATED PLASMODIUM VIVAX INFECTION

Chloroquine is the drug of choice. As quinine-based medicines may cause hypoglycemia in a pregnant woman, the woman should be advised to eat soon after she takes the tablet.

PLASMODIUM FALCIPARUM INFECTIONS

The drugs to be given include **chloroquine** in the first trimester; and **ACT-SP** [artemisinin-based combination therapy: artesunate + sulfadoxine - pyrimethamine] in the second and third trimesters.

19. TUBERCULOSIS

The treatment for TB must follow the national guideline. It involves a **combination of INH (isoniazid), rifampicin and ethambutol**. Streptomycin is not advised as it may have a teratogenic effect on the fetus.

20. SEXUALLY TRANSMITTED INFECTIONS

The management of STIs is syndromic. Treatment must follow the regimens specified in the coloured packs that are made available by the government. Each coloured pack is meant for a different sub-group of STIs.

INFECTION

TREATMENT

- Discharge causing STIs (vaginitis + cervicitis)**
- **Vaginitis** including trichomoniasis, candidiasis, and bacterial vaginosis: Treat with drugs in the **green pack** (secnidazole and fluconazole).
 - **Cervicitis** including gonorrhoea and chlamydia: Treat with drugs in the **grey pack** (azithromycin and cephixime)
- Non-herpetic ulcerative STIs (syphilis, chancroid and lymphogranuloma venerum)**
- Treat with drugs in the **white pack** (benzathene penicillin* and azithromycin)
- * If the woman is allergic to penicillin, then consider an appropriate alternative like erythromycin (refer to the protocol).*
- Herpetic syndrome**
- Treat with the drug in the **red pack** (acyclovir)
- Pelvic inflammatory disease (gonorrhoea, chlamydia and anaerobic infection)**
- Treat with the drugs in the **yellow pack** (cefixime, doxycycline and metronidazole).

The healthcare provider must make the woman (and her partner) understand that she (or they) must complete the course of treatment, even if their symptoms disappear before the treatment ends.

21. HIV INFECTION

The treatment of HIV with **anti retroviral drugs** must follow national guidelines. Treatment must extend to opportunistic infections like TB and diarrhoea (as specified in national guidelines).

22. HEPATITIS B

The treatment of hepatitis B is with conventional **interferon alpha therapy** and **anti viral drugs** (nucleoside/nucleotide analogs like tenofovir).

23. TORCH INFECTIONS

- Counsel the woman about the risk of vertical transmission of the infection to her offspring.
- The drug of choice depends on the type of infection that is present.

INFECTION

TREATMENT

Toxoplasmosis	• Antibiotic therapy. Give spiramycin to prevent foetal infection.
Others (like syphilis, hepatitis B and C)	• Refer to the management of the specific condition.
Rubella	• There is no specific treatment beyond a vaccine , but this must not be given to a pregnant woman. Women who are given the rubella vaccine must avoid getting pregnant for 28 days.
Cytomegalovirus	• Antivirals
Herpes simplex	• Antivirals
Genital herpes at the time of labour	• Arrange for her to be delivered via Cesarean section .

24. THYROID PROBLEMS

The primary objective is to manage the hormonal level.

THYROID

HYPOTHYROID

- course of T4 replacement

HYPERTHYROID

- anti-thyroid therapy

25. DIABETES

The management of diabetes has two components:

- (1) **Definitive management:** The safest drug in pregnancy for diabetes (both pre-existing diabetes and gestational diabetes) is insulin. If the woman is already on insulin, then there may be a need to change the kind, the dosage and the frequency depending on her present state of diabetic control.
- (2) **Supportive management:** This includes nutritional and lifestyle management.

- Advise the woman on the amount and types of food she should eat, and the gap between meals in order to **maintain optimal blood sugar levels**. Advise her on the need to do daily physical activities, keeping in mind her status of pregnancy and diabetes.

26. CHRONIC HYPERTENSION

The objective of management is to **prevent superimposed PIH**. For details, refer to the principles of management of PIH.

27. HEART DISEASE

The general management of heart disease during pregnancy consists of a regimen of:

- (1) restricted physical activity
- (2) salt restriction
- (3) diuretics

SPECIFIC MANAGEMENT

woman has **undergone valvular replacement**

she may have to be on **blood thinners** and treated with **antibiotics**, as she is at high risk of developing infections and endocarditis.

woman has an **uncomplicated heart disease***

she may need to be **spontaneously delivered**.

woman is at an **advanced stage of heart disease***

she should be assessed and managed at a **higher centre**.

(*For details on the grades of heart disease refer to the next page.)

GRADES OF HEART DISEASE

GRADE 1	GRADE 2	GRADE 3	GRADE 4
Cardiac disease, but no symptoms and no limitation in ordinary physical activity.	Cardiac disease with mild symptoms (viz., mild shortness of breath and/or angina) and slight limitation (due to symptoms) in ordinary physical activity.	Cardiac disease with marked limitation (due to symptoms) in ordinary and less-than-ordinary physical activities (e.g., walking between 20-100 metres) and feeling comfortable only while at rest.	Cardiac disease with a complete cessation of physical activities: symptoms appear even while the woman is at rest. She is mostly confined to bed.

CHAPTER 6

HOW TO UNDERSTAND AND TACKLE CUSTOMARY BELIEFS AND PRACTICES

Communities everywhere have customs and practices that shape the way its members (1) think about pregnancy and the postpartum period; (2) perceive and respond to risks; (3) routinely render care. Some of these beliefs and behaviours are helpful, while others cause unnecessary confusion. Some are actually harmful.

Doctors and staff nurses usually encounter these beliefs and behaviours during routine ANC clinics and obstetric emergencies. Tradition can clash with scientific evidence during these interactions. How then, are they to persuade the pregnant woman and her relatives to take medical advice seriously, when it runs counter to traditions? How are they to get the woman's family to recognise risks and understand that they need to act when symptoms first appear?

In this chapter, we list the most commonly held beliefs and practices related to childbearing in Koppal district. We first assess their scientific merit and potential impact on the health of the woman. We then offer suggestions that can be used to tackle adverse beliefs and practices in the course of day-to-day practice.



BELIEF 1: Physical work during pregnancy facilitates easy delivery.

HELPFUL NEITHER HELPFUL
 NOR HARMFUL HARMFUL



WHY? _____

In general, physical work strengthens the muscles and builds stamina, which will enable an easy vaginal delivery. However, physical work should be within limits of the pregnant woman's tolerance. Moreover, it should not compromise her health. Heavy physical work can harm a woman who has heart disease, anaemia, PIH or bleeding.

WHAT CAN BE DONE?

- Discuss the benefits of physical work with the woman and her relatives.
- Caution those with pre-existing heart disease, anaemia, PIH or bleeding against excessive physical work.



BELIEF 2: Pregnant women must stay at home during an eclipse, as it can create problems for both mother and child.

HELPFUL NEITHER HELPFUL
 NOR HARMFUL HARMFUL



WHY? _____

The idea that an eclipse can create problems for an expectant mother and her unborn child is baseless but has no adverse health impact. To that extent, it is not harmful. However, the restriction on a woman's mobility can be unhelpful, if she needs to go out of the house during the eclipse.

cont. >>

WHAT CAN BE DONE?

Clarify that there is no medical basis for restricting a pregnant woman's mobility during an eclipse while interacting with the woman and her family.



BELIEF 3: Pregnant women must avoid bananas, sesame seeds, coconut, guava, pumpkin, papaya, sweet potato and the cow's colostrum, as these can induce an abortion.

HELPFUL NEITHER HELPFUL
 NOR HARMFUL HARMFUL



WHY? _____

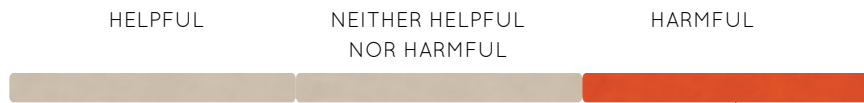
The food items listed do have nutritional value. Banana is rich in potassium and helps reduce water retention. Sesame seeds are rich in antioxidants. Papaya is rich in vitamin A. Sweet potato is rich in carbohydrates and fibre. And the cow's colostrum is rich in nutrients. However, the impact of these food items on a woman's pregnancy is not clear.

WHAT CAN BE DONE?

Encourage families who subscribe to this traditional belief to give the pregnant woman other food items that are equally nutritious.



BELIEF 4: Swelling of the feet is normal during pregnancy and will reduce on walking.



WHY? _____

Swelling of the lower limbs is a normal physiological change during pregnancy, starting from the second trimester. This swelling does not reduce with walking. It reduces only with rest in the left lateral position, as this position improves blood flow from the lower extremities.

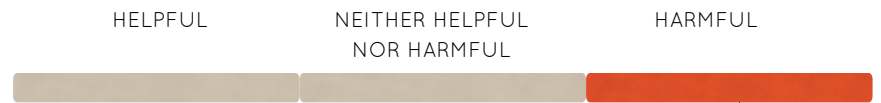
If swelling persists even after 10-12 hours of rest in a left lateral position, it clearly points to risks such as PIH and DVT. These risks must not be ignored. Walking would, not only worsen the swelling that a woman with PIH experiences, it would actually harm her health.

WHAT CAN BE DONE?

- Actively dispel the belief that persistent swelling during pregnancy is normal at every available opportunity: during ANC clinics/camps, home visits and group meetings with the woman and her relatives.
- Advise all pregnant women to rest for two hours in the left lateral position during the day, apart from eight hours of rest at night.



BELIEF 5: Headaches during pregnancy are not a problem. They go away after applying balm/Iodex.



WHY? _____

Occasional low-grade headaches are not a problem during pregnancy. Recurring headaches, on the other hand, or any headache when accompanied by other symptoms of PIH are cause for alarm. They point to impending eclampsia, which is a serious risk condition that can result in life-threatening complications.

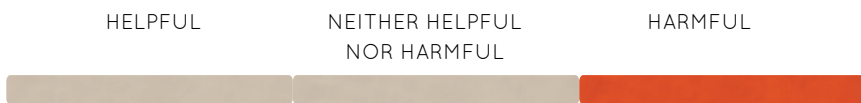
The belief that headaches are not a problem is harmful. It can make families take headaches lightly and stop the woman from seeking treatment.

WHAT CAN BE DONE?

- Actively dispel the idea that headaches are normal during pregnancy. Advise women and their relatives to seek care when they appear. Use every available opportunity to educate pregnant women and their relatives: during ANC clinics/camps, home visits and group meetings.
- Alert the families of women diagnosed with PIH during any previous pregnancy or currently, to the early warning signs of imminent eclampsia and advise them to take immediate action.



BELIEF 6: IFA tablets make the baby grow too big for normal delivery, and should therefore be avoided.



WHY? _____

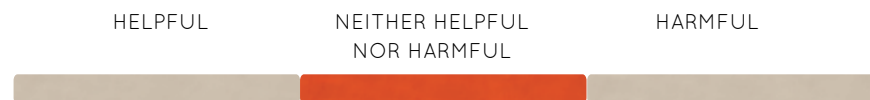
IFA is given to pregnant women to raise Hb levels, and thereby prevent maternal anaemia and low birth weight. While there is a chance that a healthy baby over 2.5 kg can make vaginal delivery difficult for a stunted woman, it is a chance that must be taken as anaemia and low birth weight can seriously damage the health and survival of both mother and child.

WHAT CAN BE DONE?

- Make the pregnant woman and her family understand the serious problems that can arise due to anaemia.
- Persuade the woman to take iron supplements, without dismissing her concerns about IFA tablets.
- Minimise the chances of non-adherence (due to gastric irritation) by advising her to take the tablets immediately after food.



BELIEF 7: A woman who has had a Caesarean section once will need to undergo Caesarean sections in subsequent deliveries.



WHY? _____

This belief is only partly true. The mere fact of a previous Caesarean section does not justify a repeat Caesarean.

cont. >>

A repeat Caesarean section is needed only if it was done the first time to tackle a prior health condition (e.g., heart disease, uterine abnormality) or a condition that is likely to recur (e.g., cephalopelvic disproportion in a short statured woman).

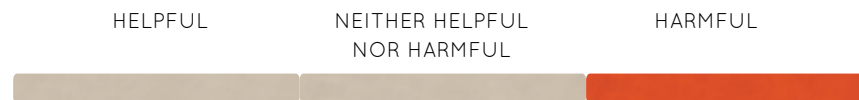
If the Caesarean section was done the first time to tackle a condition unlinked to a prior (or recurring) health condition (e.g., placenta previa, foetal distress), then subsequent deliveries could be vaginal, if there are no other indications for a Caesarean section.

WHAT CAN BE DONE?

Counsel the pregnant woman who has had a previous Caesarean section and her relatives about the factors that would determine her need for a repeat Caesarean section.



BELIEF 8: Heavy bleeding after delivery is good for the mother's health.



WHY? _____

Blood loss of up to 500 ml after a vaginal delivery and up to 800-1000 ml after a Caesarean section are to be expected. Anything more amounts to PPH, a serious complication that can either rapidly lead to hypovolemic shock and death (if left untreated), or to the intensification of anaemia in the medium term.

WHAT CAN BE DONE?

- Actively dispel this belief at every available opportunity: during ANC clinics/ camps, home visits and group meetings with women and their relatives.
- Explain why it is important to seek help immediately if there is excessive bleeding and what can be expected to happen if the bleeding is not controlled.

BELIEF 9: After delivery, a woman must be given little-to-no water, as her breast milk will get diluted and the baby can develop diarrhoea.

HELPFUL NEITHER HELPFUL
 NOR HARMFUL HARMFUL



WHY? _____

Breastfeeding mothers must drink more than their usual quota of fluids to compensate for the loss of body water through breast milk. Given this, the practice of denying water to postpartum women is harmful, as it leads to dehydration. Dehydration, in turn, increases the likelihood of CVT, especially among women who are also anaemic. It can also make them susceptible to UTI or aggravate an existing UTI.

WHAT CAN BE DONE?

Counsel the woman and her relatives about the need for increased water intake postpartum at every available opportunity: during interactions with them immediately after delivery, during postnatal visits and group meetings.



BELIEF 10: Postpartum women must be kept warm so that they lose the water that accumulated during pregnancy.

HELPFUL NEITHER HELPFUL
 NOR HARMFUL HARMFUL



WHY? _____

Providing warmth for a postpartum woman is not harmful in itself. However, if the provision of warmth is combined with the denial of water, dehydration can rapidly set in. Dehydration is harmful, as discussed above.

cont. >>

WHAT CAN BE DONE?

Emphasise the importance of adequate water intake postpartum, without dismissing the belief on the maintenance of warmth.



BELIEF 11: A postpartum woman who talks irrelevantly is possessed. She must be taken to a temple or spiritual healer for treatment.

HELPFUL NEITHER HELPFUL
 NOR HARMFUL HARMFUL



WHY? _____

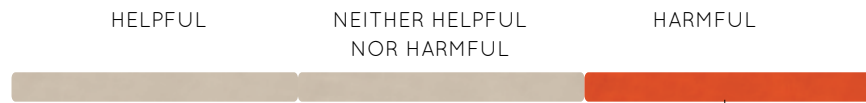
A woman who talks irrelevantly and exhibits altered behaviour could be suffering from sepsis, CVT or postpartum depression, which need immediate medical attention. Taking her quickly to a specialist could help her recover fully. But taking her to a temple or spiritual healer will do more harm than good.

WHAT CAN BE DONE?

Actively dispel this practice of not seeking medical care at every available opportunity: during ANC clinics, during interactions immediately after delivery, during postnatal visits and group meetings with the woman and her relatives.



BELIEF 12: A newborn should not be breastfed for three days after birth.
That milk is bad.

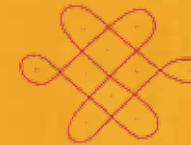


WHY? _____

First breast milk (colostrum) is rich in vitamins and protects the newborn from diarrhoeal diseases. So, denying colostrum to the newborn is detrimental to his/her health.

WHAT CAN BE DONE?

Educate pregnant women, mothers and their relatives about the need for early breastfeeding and the benefits of colostrum.





PART 2

ILLUSTRATIVE
CASE STUDIES

INTRODUCTION

The job of **identifying risks** can be challenging for doctors and staff nurses who practice in disadvantaged regions. At times, pregnant women can report atypical symptoms that are difficult to classify. At other times, they can have conditions (like diabetes or HIV) that are symptom-free. Women who do have symptoms may not always recognise or report them. Some women can have co-existing risk conditions. In this part of the handbook, we show how a clinical evaluation (of the type outlined in Chapter 1) and a cluster approach can help doctors and staff nurses identify risks in a complex world.

We take readers through 23 cases that capture the interplay of risks in disadvantaged regions. The cases build on the risk profiles of women who participated in the Project's pregnancy tracking system in Koppal district. The cases also draw on information gathered via detailed verbal autopsies of maternal deaths.

Starting from a basic description of each woman and her presenting symptoms, we take readers through the process of a clinical evaluation towards a diagnosis of her risk. As outlined in Chapter 1, the evaluation involves (1) **taking a detailed history**, (2) **conducting a physical examination (including an obstetric examination)**, and (3) **ordering a set of diagnostic tests**. Each step of the clinical evaluation provides information about the woman's symptoms, signs and test results that doctors and staff nurses can use to make a differential diagnosis.

We encourage doctors and staff nurses to read each case actively either individually or in groups. Each step of the clinical evaluation ends with a set of questions. Doctors and nurses can try to answer these questions without looking at our answers and interpretations. This would allow them to test their knowledge as they go on a guided tour of risk assessment.



CASE STUDY 1:

Govindamma, a 25 year old primi, comes to you at the beginning of her ninth month with abdominal pain and a history of recurring headaches during pregnancy.



What possible diagnoses come to mind from this initial description?

1. The most common condition that can explain both symptoms is PIH.

Other diagnoses that could explain abdominal pain or headache in a pregnant woman are:

2. Acidity
3. Preterm labour
4. Abruption placentae
5. Gastroenteritis
6. Migraine
7. Eye problems
8. Tension headache

In rare cases, abdominal pain could be due to appendicitis, ovarian cyst, etc.



On taking a **detailed history**, you elicit additional information about her symptoms:

- Pain in the upper abdomen
- Swelling of the lower limbs
- No bleeding PV or tightening of the abdomen
- Abdominal pain not associated with vomiting, diarrhoea or food intake

Now, can you narrow down the list of probable diagnoses? Why do you think so?

- Placental abruption and labour are unlikely because she has no bleeding PV or tightening of the lower abdomen.
- Acidity, gastroenteritis and appendicitis can be ruled out because she has no associated symptoms.
- Severe PIH seems the most likely cause. Swelling of the limbs with upper abdominal pain and headache point to severe PIH. Upper abdominal pain and headache are indications of imminent eclampsia.



You then identify signs from a **physical examination**:

Vitals

- BP : 150/96 mm Hg

General Examination

- Observe : Swelling of the limbs and body
- Feel : Pitting oedema all over the body

Obstetric Examination

- No tenderness in the abdomen
- No contractions in the abdomen
- FHS: 130 per minute

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- From her symptoms, we would have expected BP to be above 160/110. A reading of 150/96 is atypical. Even so, the swelling and pitting oedema all over her body support the diagnosis of severe PIH. Given this, it is safe to consider severe PIH as the most likely diagnosis, even if her BP reading is moderate.
- All findings obtained from the obstetric examination rule out labour pain and placental abruption.



Is a PV examination needed in this case?

Yes, to know if Govindamma is in labour.

Finding from a PV examination:

- The os is closed

How do you interpret this finding?

A closed os rules out labour.



Laboratory test results:

- Urine test result : Proteinuria 3+

Based on this finding, what is your final diagnosis?

Confirmed Diagnosis:

Severe PIH



CASE STUDY 2:

Sharanamma, aged 23, comes to you in the eighth month of her third pregnancy. She has been bleeding vaginally since this morning.



What possible diagnoses come to mind from this initial description?

The diagnoses that could explain the bleeding are:

1. Placenta previa
2. Abruptio placentae
3. Labour

In rare cases, bleeding could also be due to bleeding disorders, haemorrhagic fevers, and injuries.



On taking a **detailed history**, you elicit additional information about her symptoms:

- Swelling of the lower limbs
- Abdominal pain that is constant, increasing, and severe.
- A feeling of tightening in the abdomen.
- Bleeding that is moderate (i.e., not like an open tap).

In addition, you discover that she has been on treatment for hypertension for the past two months

Now, can you narrow down your initial list of diagnoses? How? Why?

- She was diagnosed with PIH and is on treatment. Her swelling can be due to PIH, and even anaemia.
- She is not likely to be in labour, since her abdominal pain is constant, not intermittent.
- Increasing and severe abdominal pain along with tightening are characteristic of placental abruption.
- Non-severe and painful bleeding is unlikely to be due to placenta previa.
- In sum, her symptoms point to abruptio placentae and/or PIH with or without anaemia.



You then identify signs from a **physical examination**:

Vitals

BP : 148/92 mm Hg

General Examination

- Observe : Pallor in the conjunctiva
Swelling of the limbs and body
Moderate vaginal bleeding
- Feel : Pitting oedema all over the body

Obstetric Examination

- Tense and tender abdomen
- No contractions in the abdomen
- FHS: Not located

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- High BP along with pitting oedema additionally points to PIH.
- Non-locatable FHS points to possible foetal death
- Pitting oedema with pallor points to anaemia.
- A tense and tender abdomen with painful bleeding points to placental abruption
- Sharanamma's symptoms and signs point to abruptio placentae with PIH, anaemia and with possible IUD.



Is a PV examination needed in this case?

A PV examination could be fatal, if the bleeding is due to placenta previa. Although the chances of placenta previa are remote, it is better to be cautious and avoid a PV examination.



Laboratory test results:

- Blood test : Hb of 8 g%
- Urine test : Proteinuria 2+
- Emergency scan : Retroplacental clot with no foetal cardiac activity

Based on these findings, what is your final diagnosis?

Confirmed Diagnosis:

Abruptio placentae with PIH, anaemia and with possible IUD



CASE STUDY 3:

Beeramma comes to you in the second month of her fourth pregnancy. Four days ago, she developed abdominal pain. Since this morning, the pain has become severe and has spread to her flanks.



What possible diagnoses come to mind from this initial description?

1. Beeramma's symptoms classically point to UTI with pyelonephritis.

Other diagnoses that could explain abdominal pain include:

2. Threatened abortion
3. Miscarriage
4. Ectopic pregnancy
5. Gastroenteritis
6. Conditions indicating surgery (e.g., appendicitis, ovarian cyst)



On taking a **detailed history**, you elicit additional information about her symptoms:

- Pain while urinating
- Fever with chills
- Bleeding PV
- No symptoms of vomiting or diarrhoea

Now, can you narrow down your initial list of diagnoses? How? Why?

- Fever with chills, pain while urinating and lower abdominal pain that has spread to Beeramma's flanks continue to support the initial diagnosis of UTI.
- Bleeding PV with abdominal pain in the second month of pregnancy can also be due to ectopic pregnancy or abortion.
- The absence of vomiting and diarrhoea rule out gastroenteritis.



You then identify signs from a **physical examination**:

Vitals:

- BP : 110/80 mm Hg
- Pulse : 120 per minute
- Temperature : 103° F.

General Examination:

- Observe : Vaginal bleeding
No foul-smelling discharge
- Feel : Mild abdominal tenderness

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- Increased pulse rate with high temperature points to either UTI or septic abortion.
- Normal BP with no symptoms of shock rules out ruptured ectopic pregnancy.
- The most likely diagnosis is UTI and, possibly, a threatened abortion or miscarriage.



Is a PV examination needed in this case?

Yes, for the following reasons:

- To see if the os is closed or open to determine if this is a threatened abortion or miscarriage;
- To look out for a tender cervix, and establish or rule out a ruptured ectopic pregnancy;
- To find out if the products of conception can be felt.

Finding from a PV examination:

- The os is open.
- The products of conception can be felt.
- No cervical tenderness.

How do you interpret these finding?

Together, these findings point to a miscarriage.



Laboratory test results:

- Blood test : Hb of 10 g%
- Urine test : 10 pus cells per HPF
- Scan : No gestational sac or foetal pole detected.

Based on these findings, what is your final diagnosis?

Confirmed Diagnosis:

Miscarriage with UTI and mild anaemia



CASE STUDY 4:

Seeta, aged 35, delivered at home and is brought to you four days later with fever and irrelevant speech.



What possible diagnoses come to mind from this initial description?

In the postpartum period, the most common causes for fever and irrelevant speech are sepsis and CVT. The irrelevant speech could also be due to psychosis. The fever could be due to an infection. The home delivery is a predisposing risk factor for sepsis.

Therefore, Seeta's symptoms could point to:

1. Puerperal sepsis
2. Puerperal psychosis
3. CVT



On taking a **detailed history**, you elicit additional information about her symptoms:

- No foul-smelling discharge
- Delivery was conducted by a trained dai in a hygienic environment, using clean instruments.

- Fever is moderate and reduces on taking tablets.
- No history of violent behaviour or hallucinations.
- Responsiveness to the newborn and his/her need for care.
- No domestic violence or mental problems.

Now, can you narrow down your initial list of diagnoses? How? Why?

- The absence of foul smelling discharge and the hygienic home delivery rule out sepsis.
- There is no contributing history to support the diagnosis of psychosis. Being a diagnosis of exclusion, however, psychosis cannot be ruled out completely.

Therefore, the likely diagnoses are:

1. CVT
2. Psychosis



You then identify signs from a **physical examination**:

Vitals:

- BP : 136/76 mm Hg
- Pulse : 90 per minute
- Temperature : 100° F
- Urine output : Normal
- Respiratory rate : 18 per minute

General Examination:

- Observe : Talking irrelevantly
Mild weakness in the right side of the body
No jaundice

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- The absence of jaundice and breathlessness together with normal urine output additionally rule out multi-organ involvement due to sepsis.
- Slightly increased temperature and mild stroke-like symptoms on the right side of the body suggest the possibility of CVT.



Is a PV examination needed in this case?

An examination is not needed, but an inspection to see if there is an infected wound or foul-smelling discharge would additionally rule out sepsis.

Finding from a PV examination:

- No infected wound or foul-smelling discharge.

How do you interpret this finding?

Puerperal infection is completely ruled out.



Laboratory test results:

- Blood test : WBC count of 10,000
- CT scan of the brain : CVT

Based on these findings, what is your final diagnosis?

Confirmed Diagnosis:

CVT



CASE STUDY 5:

Shabana, a 23 year old woman, is in fifth month of her second pregnancy. She comes to your health centre with a history of fever for the last four days.



What possible diagnoses come to mind from this initial description?

Co-morbid conditions that could explain fever during pregnancy are:

1. Malaria
2. Typhoid
3. UTI
4. Respiratory infections
5. Gastrointestinal infections

6. Septic abortion is a likely obstetric condition that could explain her fever.



On taking a **detailed history**, you elicit additional information about her symptoms:

- Intermittent fever with chills and rigours
- No history of burning micturition, cough, diarrhoea or abdominal pain.
- No history of bleeding or abdominal pain.

Now, can you narrow down your initial list of diagnoses? How? Why?

- The absence of bleeding and abdominal pain rules out septic abortion. Therefore, the fever is due to a co-morbid condition.
- The absence of burning micturition, cough, diarrhoea rule out urinary, respiratory and gastrointestinal infections.
- Intermittent fever with chills and rigours points to malaria.



You then identify signs from a **physical examination**:

Vitals:

- BP : 138/92 mm Hg
- Pulse : 110 per minute
- Temperature : 102°F

General Examination:

- Observe : Pallor in the conjunctiva
No swelling of the lower limbs or body
- Feel : Abdomen is soft.
- Hear : Chest is clear.

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- Raised temperature with pallor corroborates the diagnosis of malaria.
- Slightly higher than normal BP (92 mm Hg) without swelling suggests the possibility of early PIH.
- The clear chest additionally supports the absence of a respiratory infection.



Is a PV examination needed in this case?

No



Laboratory test results:

- Blood tests : Hb of 9 g%
Positive peripheral smear for malarial parasite
- Urine test : Proteinuria 2+

Based on these findings, what is your final diagnosis?

Confirmed Diagnosis:

Malaria with moderate anaemia and mild PIH

CASE STUDY 6:

Neela, aged 21, has severe vomiting for the past five days and has not urinated since yesterday.



What possible diagnoses come to mind from this initial description?

1. Neela's symptoms could be due to an infection in the gastrointestinal tract.
2. If she is pregnant, these symptoms could be due to hyperemesis gravidarum.



On taking a **detailed history**, you elicit additional information about her symptoms:

- Urine pregnancy test done a week ago was positive.
- Nausea, especially in the mornings, and aversion to food
- No abdominal pain or diarrhoea.
- Excessive thirst and exhaustion for the last two days.

Now, can you narrow down your initial list of diagnoses? How? Why?

- Neela's symptoms (nausea, vomiting and aversion to food during the first trimester) are classical presentations of hyperemesis gravidarum. Further, dehydration as a result of excessive vomiting is likely to have made her feel extremely thirsty.
- Absence of abdominal pain and diarrhoea along with definitive symptoms for hyperemesis gravidarum make the diagnosis of gastrointestinal infections unlikely.



You then identify signs from a **physical examination**:

Vitals:

- BP : 90/56 mm Hg
- Pulse : Rapid and feeble
- Urine output : NIL

General Examination:

- Observe : Sunken eyes
- Feel : Skin retracts very slowly after being pinched

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

Hypotension, rapid pulse, anuria, sunken eyes and dehydrated skin indicate severe dehydration. This dehydration has caused acute kidney failure, resulting in no urine output.



Is a PV examination needed in this case?

No



Laboratory tests:

- Urine test: ketonuria+

Based on this finding, what is your final diagnosis?

Confirmed Diagnosis:

Hyperemesis gravidarum with acute kidney failure.



CASE STUDY 7:

Shashi's pregnancy of two months was confirmed in the morning. That very evening, she noticed some spotting. She told her husband she had pain in the lower abdomen.



What possible diagnoses come to mind from this initial description?

Shashi's symptoms could be due to:

1. Miscarriage
2. Ectopic pregnancy
3. Co-morbid conditions such as UTI, gastrointestinal infection or appendicitis



On taking a **detailed history**, you elicit additional information about her symptoms:

- Severe abdominal pain.
- Spotting
- A fainting spell while coming to the health centre.
- No urinary symptoms
- No diarrhoea or vomiting

Now, can you narrow down your initial list of diagnoses? How? Why?

- Spotting with lower abdominal pain in the first trimester points to:
 1. Miscarriage
 2. Ectopic pregnancy
- Fainting supports the diagnosis of ectopic pregnancy.
- The absence of other localised symptoms (urinary or gastrointestinal) rules out co-morbid conditions such as UTI or gastrointestinal infections.



You then identify signs from a **physical examination**:

Vitals:

- BP : 90/56 mm Hg
- Pulse : 100 per minute

General Examination:

- Feel : Cold and clammy skin.

Obstetric Examination:

- Severe tenderness in the left lower abdomen.

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- Falling BP, rapid pulse and cold skin suggest hypovolemic shock, possibly due to ectopic pregnancy.
- Severe abdominal tenderness also points to a possible ruptured ectopic pregnancy.
- These signs along with spotting and fainting point to a very high likelihood of ruptured ectopic pregnancy.



Is a PV examination needed in this case?

Yes, to confirm other signs of ruptured ectopic pregnancy.

Finding from a PV examination:

- Severely tender cervix.
- Fluid collection felt in the pouch of Douglas.
- No products of conception are seen or felt.

How do you interpret these findings?

These findings point clearly to a ruptured ectopic pregnancy.



Laboratory test results:

- Emergency Scan : Ruptured tubal ectopic pregnancy with internal bleeding

Based on this finding, what is your final diagnosis?

Confirmed Diagnosis:

Ruptured ectopic pregnancy in hypovolemic shock.



CASE STUDY 8:

Roopa, with amenorrhoea of three months in her second pregnancy, started bleeding one morning and then developed abdominal pain, which increased during the day.



What possible diagnoses come to mind from this initial description?

Abdominal pain and vaginal bleeding in the first trimester are classically due to:

1. Miscarriage
2. Ectopic pregnancy

Abdominal pain can also be due to co-morbid conditions like:

3. UTI, gastrointestinal infections and appendicitis.



On taking a **detailed history**, you elicit additional information about her symptoms:

- No history of giddiness or fainting
- No history of urinary symptoms or diarrhoea or vomiting

Now, can you narrow down your initial list of diagnoses? How? Why?



You then identify signs from a **physical examination**:

Vitals:

- BP : 130/76 mm Hg
- Pulse : 86 per minute

Obstetric Examination:

- Tender abdomen

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

Normal BP, normal pulse with a tender abdomen do not provide any more information to support or rule out any of the initial diagnoses.



Is a PV examination needed in this case?

Yes. To find out whether she had miscarriage, and if so, whether it is complete.

Finding from a PV examination:

- Os is closed.
- No cervical tenderness.

How do you interpret these findings?

- A closed os rules out miscarriage.
- Absence of cervical tenderness rules out ruptured ectopic pregnancy.
- These findings, along with bleeding and abdominal pain, point to a threatened abortion.



Laboratory test results:

Scan : A viable intrauterine gestation

Based on this finding, what is your final diagnosis?

Confirmed Diagnosis:

Threatened abortion



CASE STUDY 9:

Swarna, aged 30, is in the eighth month of her third pregnancy. Her legs are swollen. She does not feel like working but forces herself to do household work.



What possible diagnoses come to mind from this initial description?

The conditions that explain her initial symptoms are:

1. Anaemia
2. PIH
3. The swelling can also be explained by problems related to the heart, kidney or liver.
4. In rare cases, these can be because of nutritional imbalance.



On taking a detailed history, you elicit additional information about her symptoms:

- She is in her seventh month of pregnancy.
- The swelling reduces slightly with rest but not completely.
- No swelling in the hands, face or body.
- No history of cough or breathlessness.
- No history of jaundice, abdominal pain or vomiting.
- No history of headache, blurring of vision or flashes of light.

Now, can you narrow down your initial list of diagnoses? How? Why?

- The swelling is not likely to be due to co-morbid conditions since there are no indicative symptoms.
- The swelling cannot be physiological, as it does not reduce significantly with rest.
- The manifestations of severe anaemia (breathlessness or cough) or severe PIH (abdominal pain, headache, breathlessness, blurring of vision) are absent.

Therefore, the likely causes are:

1. Moderate anaemia
2. Moderate PIH



You then identify signs from a **physical examination**:

Vitals:

- BP : 146/100 mm Hg
- Pulse : 78 per minute

General Examination:

- Observe : Pallor in the conjunctiva
No jaundice in the eyes
Pedal oedema of both limbs
- Feel : Pitting pedal oedema

Obstetric Examination:

- Fundal height corresponds to 30 weeks
- FHS : 130 per minute

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- Pallor and oedema point to anaemia.
- Increased BP and oedema point to PIH.



Is a PV examination needed in this case?

No



Laboratory test results:

- Blood test : Hb of 8 g%
- Urine test : Proteinuria 1+

Based on these findings, what is your final diagnosis?

Confirmed Diagnosis:

Moderate anaemia with moderate PIH



CASE STUDY 10:

Rathamma, 30 years, is in the seventh month of her fourth pregnancy. She comes regularly for ANC. You notice that she has not gained weight and is coughing.



What possible diagnoses come to mind from this initial description?

Rathamma's cough and lack of weight gain point to:

1. TB
2. Severe Anaemia

Her cough could also be due to:

3. Pneumonia
4. Upper respiratory tract infections
5. Allergies

Lack of weight gain can also be due to:

6. Undernutrition
7. Hyperthyroidism
8. Rathamma's multi-gravid status ("too many pregnancies") is a predisposing risk factor for anaemia.



On taking a **detailed history**, you elicit additional information about her symptoms:

- Cough that has persisted for about a month.
- Night sweats with fever.
- Cough with sputum, sometimes mixed with blood.
- Chest pain and weakness.
- Increased appetite.

Now, can you narrow down your initial list of diagnoses? How? Why?

- Chronic productive cough, night sweats and lack of weight gain point to pulmonary TB.
- Increased appetite does not support tuberculosis, but can be due to a co-existing condition like hyperthyroidism.
- Lack of weight gain and weakness can be due to anaemia, hyperthyroidism or HIV.
- Therefore, the likely diagnosis at this stage are:
 1. Pulmonary TB
 2. Anaemia
 3. Hyperthyroidism



You then identify signs from a **physical examination**:

Vitals:

- BP : 140/92 mm Hg
- Pulse : 120 per minute
- Temperature : 98° F

General Examination:

- Observe : No oedema of the limbs
Bulging eyes
Pallor in the conjunctiva
Throat is normal.
- Hear : Decreased air entry in the left lower lobe
Cardia is normal.

Obstetric Examination:

- Fundal height corresponding to 26 weeks
- FHS: 134 per minute

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- Increased BP, rapid pulse, bulging eyes along with no weight gain, increased appetite and weakness point to hyperthyroidism.
- Pallor along with weakness and no weight gain can be due to malnutrition or anaemia.
- Decreased air entry suggests a lung pathology. This sign supports the initial diagnosis of TB.
- Increased BP can also be due to PIH. But the diagnosis of PIH would be supported if there is swelling or proteinuria, or both. Even though it is not necessary that all the three should be present to make a diagnosis of PIH, it is important to obtain confirmatory indications in this case because high BP can also be explained by hyperthyroidism. However, Rathamma does not have any swelling. Therefore, PIH is unlikely.



Is a PV examination needed in this case?

No



Laboratory test results:

- Blood test : Hb 9 g%
- Urine test : No proteins in urine.
- Sputum test : Positive for AFB
- Mantoux Test : Positive
- Chest X-ray showing patchy consolidations
- Decreased levels of TSH
- Increased T3 and T4
- ELISA for HIV : Non reactive

Based on these findings, what is your final diagnosis?

Confirmed Diagnosis:

Pulmonary TB with hyperthyroidism with moderate anaemia in pregnancy

CASE STUDY 11:

Malathi, a 30 year old primi in her fourth month of pregnancy, has come to the health centre with a history of genital itching and profuse PV discharge.



What possible diagnoses come to mind from this initial description?

Genital itching and profuse discharge commonly suggest the presence of one or more of the following conditions:

1. Discharge causing syndrome with STIs like trichomoniasis.
2. Ulcerative syndrome (herpetic and/or non-herpetic).
3. If there is an additional history of abdominal pain, then lower abdominal pain syndrome is also a possibility.



On taking a **detailed history**, you elicit additional information about her symptoms:

- A history of painful ulcers
- A history of weight loss

Now, can you narrow down your initial list of diagnoses? How? Why?

- Discharge and itching point to a discharge causing STI.
- The presence of ulcers points to an ulcerative STI: syphilis, chancroid or herpes. But syphilis presents as a painless ulcer. So, the STI is likely to be either chancroid or herpes.
- The most common causes of weight loss are TB, malnutrition, hyperthyroidism, HIV, hepatitis B or C.
- Given Malathi's history suggestive of an STI, her weight loss is most likely to be due to another sexually transmitted condition, such as HIV and/or hepatitis B/C.



You then identify signs from a **physical examination**.

Vitals:

- BP : 130/86 mm Hg
- Pulse : 84 per minute

General Examination:

- Observe : Jaundice
- Feel : Inguinal lymphadenopathy

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

Jaundice and hepatomegaly suggest a liver pathology. With a history suggestive of STI, these signs support the diagnosis of hepatitis.



Is a PV examination needed in this case?

Yes, because a STI can be definitively diagnosed only through a local examination.

Finding from a PV examination:

- Multiple small water-filled painful blebs in clusters
- Tender shallow ulcers

How do you interpret these findings?

Multiple, shallow and tender ulcers are characteristic indicators of herpes.



Laboratory test results:

- Blood test : ELISA for HIV is non reactive
HBsAg is positive
- Wet mount of vaginal discharge shows motile flagella (tric)
- Positive direct test for viral isolation and detection of HSV antigen

Based on these findings, what is your final diagnosis?

Confirmed Diagnosis:

Hepatitis B with genital herpes and trichomoniasis

CASE STUDY 12:

Kalavathi, 30 years and pregnant for the third time, comes for a routine ANC checkup in her sixth month of pregnancy.



What possible diagnoses come to mind from this initial description?

No information suggestive of any problem.



On taking a **detailed history**, you elicit some symptoms:

- Her abdomen looks bigger than the reported gestational age.
- She complains of frequent micturition.
- She feels thirsty.
- She has no abdominal pain, discomfort, burning micturition or fever.
- She is not known to be diabetic.

Now, can you identify a list of possible diagnoses? How? Why?

An abdomen that looks bigger than the reported gestational age could be due to:

1. Wrong dates
2. Hydramnios
3. Twins

Frequent micturition is most commonly due to:

4. UTI, which is unlikely in Kalavathi's case because of the absence of burning micturition, fever or abdominal pain
5. Diabetes, which is more likely because of the symptoms of thirst and frequent micturition

At this stage, Kalavathi would appear to have gestational diabetes, possibly with hydramnios.



You then identify signs from a **physical examination:**

Vitals:

- BP : 140/88 mm Hg
- Pulse : 80 per minute
- Weight : 54 kg, weight gain of 4 kg from the previous month.

General Examination:

- Observe : Pallor in the conjunctiva
Bilateral pedal oedema
- Feel : Bilateral pitting pedal oedema

Obstetric Examination:

- Fundal height corresponding to 30 weeks
- Excessive fluid masking foetal parts.

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- Weight gain of 4 kg in a month is abnormal. This excessive weight gain could be due to PIH, hydramnios, and/or hypothyroidism.
- High BP (Systolic of 140 mm Hg), excessive weight gain and oedema point to PIH.
- Abnormally high fundal height with excessive fluid suggests hydramnios.
- Hydramnios with frequent micturition and thirst suggests diabetes.
- Pallor with oedema suggests anaemia.

Therefore, the most likely diagnoses are:

1. Gestational diabetes with hydramnios
2. PIH
3. Anaemia
4. Hypothyroidism



Is a PV examination needed in this case?

No



Laboratory test results:

- Blood tests : Hb 9 g%
FBS 130 mg%
PPBS 230 mg%
TSH, T3 and T4 Normal
- Urine Tests : Sugar Positive
Proteinuria 1+
- Scan : Hydramnios

Based on these findings, what is your final diagnosis?

Confirmed Diagnosis:

Gestational diabetes with hydramnios with moderate PIH and moderate anaemia



CASE STUDY 13:

Zareena, a 20 year old primi in her seventh month, comes to your health centre with a history of breathlessness and cough for the past one month.



What possible diagnoses come to mind from this initial description?

The breathlessness and cough could be due to:

1. Severe Anaemia
2. Severe PIH
3. Respiratory causes like TB, bronchitis.
4. Cardiac problems like valvular heart disease or congenital heart disease



On taking a **detailed history**, you elicit additional information about her symptoms:

- She was diagnosed one decade ago with a heart problem that began with a throat infection.

- She cannot carry out daily activities because of breathlessness.
- She cannot sleep soundly because the cough worsens when she lies down.
- She has swelling of the hands and feet.
- She does not have night sweats or cough with blood.

Now, can you narrow down your initial list of diagnoses? How? Why?

- A heart problem, diagnosed in early childhood, that was preceded by a throat infection is likely to be rheumatic heart disease.
- Extreme breathlessness and cough are also possibly due to a pre-existing heart disease.
- There are no specific reasons to consider a respiratory problem.
- Therefore, Zareena's condition is most likely to be due a pre-existing heart disease. Other conditions like PIH and anaemia cannot be ruled out at this stage.



You then identify signs from a **physical examination:**

Vitals:

- BP : 130/94 mm Hg
- Pulse : 110 per minute
- Respiratory rate : 28 per minute

General Examination:

- Observe : Severe pallor in the conjunctiva
Generalised swelling of the feet, hands and body.
Raised jugular venous pressure in the neck.
- Feel : Pitting oedema all over the body
Tender hepatomegaly
- Hear : (Lungs) Basal crepitations, no rhonchi.
(Heart) Both systolic and diastolic murmurs audible.

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- Pallor, breathlessness, basal crepitations, tender hepatomegaly, raised jugular venous pressure and systolic murmurs together suggest anaemia with heart failure.
- Diastolic murmurs with a history of diagnosed heart disease indicate a pre-existing heart disease.
- High BP (Diastolic is 94 mm Hg), swelling of the body and breathlessness suggest PIH.

Therefore, the most likely diagnoses at this stage are:

1. Pre-existing heart problem
2. Severe anaemia
3. PIH
4. Heart failure



Is a PV examination needed in this case?

No



Laboratory test results:

- Blood tests : Hb 6 g%
- Urine tests : No proteinuria
- Echocardiogram : Moderate mitral stenosis
- Obstetric scan : Single live intrauterine gestation corresponding to 26 weeks.

Based on these findings, what is your final diagnosis?

Confirmed Diagnosis:

Severe anaemia with mitral stenosis in failure and moderate PIH



CASE STUDY 14:

Shanta, a 35 year old woman is pregnant for the sixth time. She has come to your PHC in eighth month with a history of abdominal pain and weakness.



What possible diagnoses come to mind from this initial description?

These are non-specific symptoms. A detailed history is needed to identify Shanta's risk conditions.



On taking a **detailed history**, you elicit additional information about her symptoms:

- It has been four months since she visited the PHC.
- She has found it impossible to lift heavy loads (e.g., firewood, water) for many years, long before her current pregnancy.
- She limps while walking. On probing, she reports that she got injured the previous day after one of her husband's bouts of violence.
- Her pain is in the lower abdomen. It began yesterday.

Now, can you narrow down your initial list of diagnoses? How? Why?

- There is a clear history of domestic violence in Shanta's life, which has resulted in her missing ANC visits.
- Long-standing weakness is likely to be due to anaemia, either on its own or in combination with depression due to violence.
- Lower abdominal pain in the third trimester could be labour pain.
- Lower abdominal pain could also be due to abruption. Bleeding in abruption need not be visible.

There are four possible diagnoses at this stage:

1. Domestic violence
2. Anaemia
3. Labour
4. Placental abruption



You then identify signs from a **physical examination**:

Vitals:

- BP : 110/84 mm Hg
- Pulse : 66 per minute

General Examination:

- Observe : Severe pallor in conjunctiva
Multiple injury marks and bruises on the lower limbs
Swelling of both lower limbs.
- Feel : Pitting pedal oedema of both limbs

Obstetric Examination:

- Uterine contractions are palpable.
- Foetal head is fixed.
- FHS: 154 per minute

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- Pallor, oedema and weakness point to anaemia.
- Injury marks provide evidence for violence.
- BP being normal, the swelling may not be due to PIH.
- Uterine contractions indicate labour.

Therefore, the likely diagnoses are:

1. Domestic violence
2. Anaemia
3. Labour



Is a PV examination needed in this case?

Yes, to ascertain if Shanta is in labour.

PV examination:

- Cervix is 4 cm dilated, 80 percent effaced.

How do you interpret this finding?

She is in the first stage labour.



Laboratory test results:

- Blood tests : Hb 7 g%
RBS: 260 mg%
- Urine tests : No Proteinuria

Based on these findings, what is your final diagnosis?

Confirmed Diagnosis:

Woman in the first stage of labour with severe anaemia, gestational diabetes and a history of domestic violence



CASE STUDY 15:

Rama, a 25 year old primi, has completed eight months of pregnancy. She goes every month for an ANC checkup. Doctor recommended a scan but her mother and grandmother did not think it was necessary. At the toilet today, she suddenly started bleeding.



What possible diagnoses come to mind from this initial description?

Bleeding in third trimester is mostly due to:

1. Placenta previa
2. Abruptio placentae
3. Labour



On taking a **detailed history**, you elicit additional information about her symptoms:

- Rama's bleeding is heavy

- She does not have abdominal pain or backache.

Now, can you narrow down your initial list of diagnoses? How? Why?

- The absence of abdominal pain and backache indicates that Rama is not in labour. Her heavy bleeding must be due to a placental problem.
- Bleeding due to placental abruption is associated with abdominal pain and tightening. Since Rama does not complain of abdominal pain, her bleeding is not due to abruption.
- Bleeding that is painless and profuse is characteristic of placenta previa. Given this, Rama's bleeding is most likely due to placenta previa.



You then identify signs from a **physical examination**:

Vitals:

- BP : 80/50 mm Hg
- Pulse : Feeble and rapid
- Respiratory rate : 24 per minute

General Examination:

- Observe : Profuse PV bleeding
- Feel : Cold and clammy extremities

Obstetric Examination:

- No tenderness or contractions in the abdomen
- Foetal movements are felt.
- FHS is located and is 128 per minute

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- Falling BP, feeble pulse, profuse PV bleeding with cold and clammy extremities clearly indicate placenta previa.
- The absence of abdominal tenderness definitively rules out placental abruption.



Is a PV examination needed in this case?

No. In fact, a PV examination is contraindicated in placenta previa and must be avoided at all costs.



Laboratory test results:

- Emergency scan: Placenta at the lower pole.

Based on these findings, what is your final diagnosis?

Confirmed Diagnosis:

Bleeding placenta previa in hypovolemic shock



CASE STUDY 16:

Mangala is in her ninth month of pregnancy. Her waters broke early this morning.



What possible diagnoses come to mind from this initial description?

The most likely reasons for Mangala's waters to break are:

1. Labour
2. PROM



On taking a **detailed history**, you elicit additional information about her symptoms:

- It has been 12 hours since her waters broke.
- She does not have any abdominal pain.
- She does not have fever.

Now, can you narrow down your initial list of diagnoses? How? Why?



You then identify signs from a **physical examination**:

Vitals:

- BP : 126/76 mm Hg
- Pulse : 50 per minute

General Examination:

- Observe : Swelling of both limbs
- Feel : Non-pitting swelling of the limbs
Cool and dry skin

Obstetric Examination:

- No uterine contractions
- FHS : 160 per minute

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- The absence of uterine contractions rule out labour.
- Decreased pulse rate, non-pitting oedema, cool and dry skin suggest hypothyroidism.

The likely diagnoses at this stage are:

1. PROM
2. Hypothyroidism



Is a PV examination needed in this case?

Yes, to ascertain PROM and to know if there are any signs of labour.

PV examination:

- Cervical os is closed.
- Clear liquid is leaking PV

How do you interpret these findings?

- The closed cervical os confirms that labour has not started.
- The clear fluid discharge without signs of labour confirms PROM.



Laboratory test results:

- Blood test : Reduced T3 and T4, normal TSH
- USG : Oligohydramnios

Based on these findings, what is your final diagnosis?

Confirmed Diagnosis:

PROM with hypothyroidism



CASE STUDY 17:

Esther, a 28 year old second gravida, comes to your PHC with labour pains. She did not have any risks during pregnancy. She delivers within two hours after her arrival. One hour after delivery, her mother reports that she is sweating profusely.



What possible diagnoses come to mind from this initial description?

1. The most important reason for profuse sweating after delivery is PPH.

Rarely, it can also be due to causes such as:

2. Myocardial infarction
3. Amniotic fluid embolism
4. Metabolic disturbances



On taking a **detailed history**, you elicit additional information about her symptoms:

- She has giddiness.
- She is bleeding PV.
- She does not complain of chest pain.
- The staff nurse tells you that the placenta was expelled completely.

Now, can you narrow down your initial list of diagnoses? How? Why?

Bleeding PV after delivery, giddiness and sweating clearly suggest PPH.

- Further details are needed only to identify the specific cause for the PPH.
- As the placenta is expelled completely, remnants of placenta are unlikely to be the cause for PPH, in this case.



You then identify signs from a physical examination:

Vitals:

- BP : 86/58 mm Hg
- Pulse : Rapid and feeble
- Respiratory rate : 36 per minute

General Examination:

- Observe : Severe breathlessness

Obstetric Examination:

- Uterus is hard and well contracted.

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- Breathlessness, low BP and rapid pulse point to hypovolemic shock.
- A hard and well contracted uterus rules out uterine atony. Therefore, the most likely cause of PPH is trauma.



Is a PV examination needed in this case?

Yes, to confirm PPH and to assess if there are any injuries.

PV examination:

- Active and fresh bleeding PV
- No vaginal or perineal tears
- Cervical tear present

How do you interpret these findings?

This clearly establishes that PPH is due to a cervical tear



What is your final diagnosis?

Confirmed Diagnosis:

PPH due to cervical tear in hypovolemic shock



CASE STUDY 18:

Lakshmi, aged 14, has just delivered a baby at home. Within one hour of delivery, she fell from the bed and became unconscious. She is brought unconscious to your health centre.



What possible diagnoses come to mind from this initial description?

1. Loss of consciousness immediately after delivery is most likely due to severe PPH.

Other causes include:

2. Head injury
3. Eclampsia
4. Myocardial infraction
5. Metabolic disturbances like severe hypoglycaemia or severe hyperglycaemia.



On taking a **detailed history**, you elicit additional information about her symptoms:

- Only one pad/sari has been changed since delivery.
- She has not complained of chest pain.
- Her vision has been blurred for the last 10 days.
- For the past month, she has frequently complained of headache.
- After falling down, she was shaking her limbs violently for a few minutes before losing consciousness.

Now, can you narrow down your initial list of diagnoses? How? Why?

- Not changing the sari/pad frequently suggests that Lakshmi's postpartum bleeding is not excessive. Therefore, PPH seems unlikely.
- The absence of chest pain makes myocardial infarction unlikely.
- Head injury cannot be ruled out at this stage.
- Blurred vision and frequent headaches much before Lakshmi's fall point to PIH. Fits followed by the loss of consciousness indicate life threatening PIH (eclampsia).
- Pregnancy at an early age is a predisposing risk factor for PIH.

Therefore, the most likely diagnosis is an undiagnosed PIH, which is now complicated as a postpartum eclampsia. Even though PIH, usually comes down immediately after delivery, it can last for 48 hours after delivery in some cases.



You then identify signs from a **physical examination**:

Vitals:

- BP : 160/116 mm Hg
- Pulse : 100 per minute
- Respiratory rate : 28 per minute

General Examination:

- Observe : Swelling of whole body
Breathlessness
- Feel : Pitting oedema all over the body
- Hear : Basal crepitation in the lungs

Obstetric Examination:

- Uterus is hard and well contracted

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- High BP, breathlessness, swelling all over the body and basal crepitation clearly point to PIH in its most severe form (eclampsia).
- The well contracted uterus along with normal postpartum bleeding make PPH even less likely.



Is a PV examination needed in this case?

Yes, to rule out PPH with certainty.

PV Examination:

- There is no fresh and profuse bleeding.

How do you interpret this finding?

The absence of profuse bleeding PV conclusively rules out PPH.



Laboratory test results:

- Blood test : Hb 10 g%
RBS 120 mg%
- Urine test : Proteinuria 3+

Based on these findings, what is your final diagnosis?

Confirmed Diagnosis:

Postpartum eclampsia with mild anaemia

CASE STUDY 19:

Sunanda delivered a week ago. She has fever for the past two days.



What possible diagnoses come to mind from this initial description?

Fever in the postpartum period is mostly due to an infection, most commonly of the birth canal or of the breast, leading to:

1. Puerperal sepsis
2. Mastitis or breast abscess

Other causes of fever include:

3. Respiratory infections
4. UTI
5. CVT (in rare cases)



On taking a **detailed history**, you elicit additional information about her symptoms:

- She does not complain of abdominal pain or burning micturition or foul-smelling discharge.
- She is not able to feed the baby for the last two days due to pain in the breast.
- Her behaviour has not altered after delivery.
- She does not have headaches, weakness in any part of the body or loss of consciousness.
- She does not have cough, diarrhoea or any other complaint.

Now, can you narrow down your initial list of diagnoses? How? Why?

- Breast pain and an inability to feed the baby, in addition to fever, point to a problem in the breast: either mastitis or breast abscess.
- The absence of foul-smelling discharge and abdominal pain rules out puerperal sepsis.
- The absence of headache, altered behaviour, weakness in any part of the body or loss of consciousness, makes CVT less likely.

- The absence of abdominal pain and burning micturition rules out UTI.
- The absence of symptoms such as cough, diarrhoea rule out other sources of infection.

The most likely causes of Sunanda's fever are:

1. Mastitis
2. Breast abscess.



You then identify signs from a **physical examination**:

Vitals:

- BP : 110/68 mm Hg
- Pulse : 110 per minute
- Temperature : 103° F

Obstetric Examination:

- No abdominal tenderness

Breast Examination:

- Redness in the left breast.
- Localised swelling and severe tenderness on the left side of the left breast. The swelling is pointed.

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

High temperature and high pulse rate together with localised swelling, tenderness and redness in the breast clearly point to a breast abscess. The pointed nature of the swelling suggests that the pus collected inside the abscess is about to rupture.



Is a PV examination needed in this case?

Yes, to rule out perineal infections.

PV Examination:

- There is no foul-smelling discharge.
- There is no evidence of any infected wound.

How do you interpret these findings?

The PV findings rule out perineal infections and, thereby, puerperal sepsis.



Laboratory test results:

- Blood tests : WBC count of 15,000
- Pus culture : Pus aspirated from the swelling in the breast shows growth of *Staphylococcus aureus*.

Based on these findings, what is your final diagnosis?

Confirmed Diagnosis:

Staphylococcus aureus induced abscess of the left breast



CASE STUDY 20:

Girija delivered 10 days ago. She has fever and has been talking irrelevantly.



What possible diagnoses come to mind from this initial description?

Fever and irrelevant talk in a postpartum woman are commonly associated with three important conditions:

1. Puerperal sepsis
2. Puerperal psychosis
3. CVT



On taking a **detailed history**, you elicit additional information about her symptoms:

- She has been talking irrelevantly for the past five days.
- Since then, she has also started talking to someone who does not exist.
- She was taken to the temple three days ago.
- She developed fever after her visit to the temple.
- She has never taken care of the baby since its birth.
- She does not complain of abdominal pain.
- She does not complain of any other symptoms like burning urination, cough, diarrhoea or headache.

Now, can you narrow down your initial list of diagnoses? How? Why?

- Sepsis does present with fever and at times may result in irrelevant speech. But in Girija's case, the fever followed her irrelevant speech, which means that it could not have caused the irrelevant speech. Hence, sepsis cannot explain Girija's irrelevant speech.
- Hallucinations are a typical feature of psychological problems like psychosis. So this is most likely a case of psychosis superimposed with an infection.
- Sepsis seems unlikely because of the absence of abdominal pain, but cannot be ruled out at this stage without a physical examination.
- CVT cannot be ruled out either with these symptoms.

Therefore, in the order of likelihood, this is a case of:

1. Puerperal psychosis
2. CVT
3. Puerperal sepsis



You then identify signs from a **physical examination**:

Vitals:

- BP : 136/84 mm Hg
- Pulse : 98 per minute
- Temperature : 102°F

Obstetric Examination:

- No abdominal tenderness

Breast Examination:

- Localised swelling in the left breast with redness and extreme tenderness.

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- Increased temperature along with localised swelling in the breast with redness and tenderness clearly point to breast abscess.
- The absence of abdominal tenderness makes the diagnosis of puerperal sepsis unlikely.
- If sepsis is unlikely, Girija's irrelevant talk, hallucinations and disinterest in the newborn are probably due to a psychological condition such as puerperal psychosis.



Is a PV examination needed in this case?

Yes, to check for signs of infection.

PV Examination:

- No foul-smelling discharge
- No evidence of any infected wound

How do you interpret these findings?

- The absence of an infected wound, foul-smelling discharge, abdominal pain and tenderness conclusively rule out puerperal sepsis.



Laboratory test results:

- Blood tests : WBC count of 18,000
- CT scan of the brain : Normal

Based on these findings, what is your final diagnosis?

Confirmed Diagnosis:

Breast abscess with puerperal psychosis

CASE STUDY 21:

Nirmala, aged 23, delivered a male baby 10 days ago. For the past two days, she has loose stools and chest pain.



What possible diagnoses come to mind from this initial description?

The symptoms are non-specific and would require further investigation.

- At the very least, loose stools can be due to gastroenteritis. However, they could also indicate a more serious hidden problem such as HIV.
- Similarly, chest pain per se is non-specific. It could be due to respiratory problems, gastritis, musculoskeletal problem, etc.



On taking a **detailed history** from Nirmala's mother, you elicit additional information about her symptoms:

- Nirmala's chest pain started after she was hit on the chest by her husband.
- She is in a violent relationship. The physical violence has intensified after she got pregnant.
- Nirmala has become unusually irritable after delivery.
- She has severe mood swings, does not talk with anyone and feels shame and guilt.
- Nirmala's stools are watery and she has colicky abdominal pain for the past two days.
- She does not have fever.

Now, can you narrow down your initial list of diagnoses? How? Why?

- Watery stools, associated with colicky abdominal pain suggest gastroenteritis.
- Chest pain is clearly due to the physical injury inflicted on her by Nirmala's husband.
- The strong history of domestic violence coupled with Nirmala's irritability, mood swings and withdrawn behaviour suggest puerperal depression.



You then identify signs from a **physical examination**:

Vitals:

BP : 128/68 mm Hg
Pulse : 80 per minute

General Examination:

- Observe : Bruises on the left side of the chest wall, where she complains of pain
- Feel : Tenderness on the bruised area.
- Hear : Chest is clear

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

The evidence of painful bruises on the chest confirm the reported history of domestic violence.



Is a PV examination needed in this case?

No



What is your final diagnosis?

Confirmed Diagnosis:

Puerperal depression, gastroenteritis and domestic violence



CASE STUDY 22:

Pushpa, a 15 year old primi in her eighth month, is brought to the health centre with history of loose stools, vomiting and right-sided headache



What possible diagnoses come to mind from this initial description?

1. Vomiting and loose stools generally point to a gastrointestinal infection.
2. A one-sided headache would most likely be a migraine.

The headache could also be:

3. A tension headache
4. A headache related to visual problems
5. A headache due to hypertension



On taking a **detailed history**, you elicit additional information about her symptoms:

- She has swelling of the feet and face.
- She has blurred vision.
- She does not have fever.

Now, can you narrow down your initial list of diagnoses? How? Why?

1. Vomiting and loose stools suggest gastroenteritis.
2. All other symptoms, (i.e., swelling, blurred vision and headache), are classical features of severe PIH. Even though a one-sided headache is not typical of PIH, we should not always expect symptoms to be typical in all women.

Most likely, Pushpa has both severe PIH and gastroenteritis.



You then identify signs from a **physical examination**:

Vitals:

- BP : 180/110 mm Hg
- Pulse : 80 per minute

General Examination:

- Observe : Oedema of the feet and face
- Feel : Pitting oedema on the feet and face.

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- High BP and swelling of feet and face additionally support the diagnosis of severe PIH.



Is a PV examination needed in this case?

No



Laboratory test results:

- Blood test : Hb 9.5 g%
- Urine test : Proteinuria 2+
- CT scan : Normal

Based on these findings, what is your final diagnosis?

Confirmed Diagnosis:

Severe PIH with mild anaemia and gastroenteritis



CASE STUDY 23:

Jyothi, a 25 year old primi, comes to your health centre in her ninth month with abdominal pain.



What possible diagnoses come to mind from this initial description?

Abdominal pain towards the end of pregnancy can be due to:

1. Labour
2. Placental abruption
3. Severe PIH



On taking a **detailed history**, you elicit additional information about her symptoms:

- She had polio during her childhood.
- She has had headaches throughout the pregnancy.
- Her BP was said to be normal during previous ANC visits.

Now, can you narrow down your initial list of diagnoses? How? Why?

- She has a physical disability that could result in pelvic inadequacy.
- Frequent headaches and abdominal pain point to severe PIH.
- However, labour or abruption cannot be ruled out at this stage.



You then identify signs from a **physical examination**:

Vitals:

- BP : 180/120 mm Hg
- Pulse : 70 per minute

General Examination:

- Observe : Pale conjunctiva
Swollen feet

Obstetric Examination:

- Tender abdomen
- Inaudible FHS

How do you interpret these signs?

Do these signs support your initial diagnosis? How? Why?

- Very high BP and swollen feet with frequent headaches and abdominal pain point to severe PIH.
- A tender abdomen and history of abdominal pain suggest placental abruption.
- Inaudible FHS points to possible IUD.



Is a PV examination needed in this case?

Yes. To ascertain or rule out the onset of labour and PV bleeding.

PV Examination:

- Bleeding PV
- No dilatation or effacement

How do you interpret these findings?

- The absence of dilatation/effacement confirms that she is not in labour.
- Vaginal bleeding along with a tender abdomen and abdominal pain clearly points to placental abruption.



Laboratory test results:

- Blood test : Hb 9 g%
- Urine test : Proteinuria 3+
- USG : Retro-placental clot with no foetal cardiac activity.

Based on these findings, what is your final diagnosis?

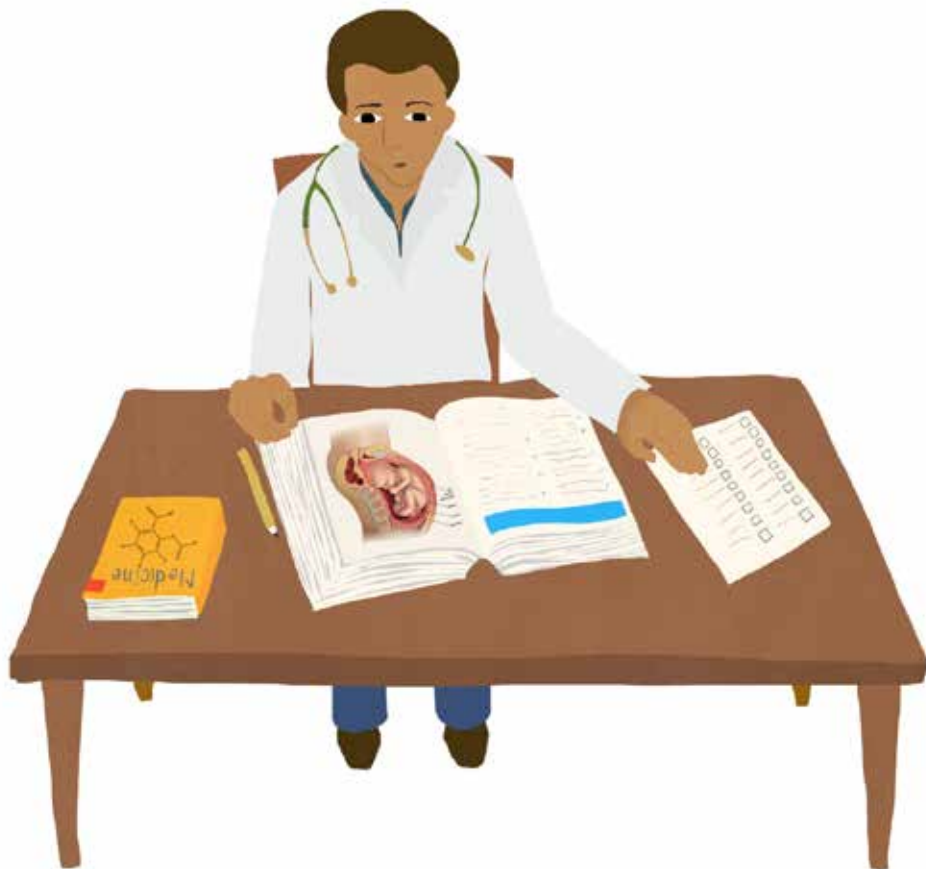
Confirmed Diagnosis:

Severe PIH with placental abruption with IUD and moderate anaemia



PART 3

EXERCISES



EXERCISE 1:

CASE STUDIES

Our objective in putting together this collection of cases is to help users of this handbook test their knowledge of risks. We present essential information about the clinical profiles of different women, including an obstetric index (“GPAL”) that summarises their obstetric histories.

- G** refers to the number of pregnancies, including the current one
- P** refers to the number of previous pregnancies that have crossed the period of viability (usually taken as 28 weeks in underprivileged settings)
- A** refers to number of abortions
- L** refers to the number of living children

We urge all users to read each case carefully and then answer three questions:

- i. What are the woman’s **predisposing risk factors and context**?
- ii. What are her **symptoms, signs and test results** ?
- iii. What are your **initial diagnosis (diagnoses)** of her underlying risk condition(s)?

(For answers to these questions, please refer to page 210.)

1. Lakshmi, aged 16, is a primi in her eighth month of pregnancy. She has a persistent cough for the past 1.5 months, and swelling of both limbs for the past month. Her weight gain was adequate until two months ago; ever since, it has been marginal. She has slight fever at night. She had a fit last week. She had repeated fits yesterday and is now unconscious.

i) **PREDISPOSING FACTORS+ CONTEXT**

ii) **SYMPTOMS+ SIGNS+ TEST RESULTS**

iii) **INITIAL DIAGNOSIS**

2. Huligamma, aged 40, delivered her eighth child at home. She had excessive sweating and breathlessness half an hour after delivery of the placenta. Seeing this, her attenders called for the 108 ambulance. Huligamma died in the ambulance on the way to hospital.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

3. Kempamma, aged 18, delivered her second child 15 days ago. She has fever, and a painful, swollen breast for the past four days. She has neither eaten well since delivery, nor fed the baby.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

4. Mallamma, aged 26 and P3L3, delivered at home 15 days ago. She has a history of excessive bleeding after delivery. She has fever for the past four days with foul-smelling vaginal discharge. She has yellowish discolouration of the eyes and breathlessness for the past two days.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

5. In her eighth month, 26 year old Shivamma, G2P1L1, has persistent swelling of the lower limbs. She complains of anxiety and palpitations. She also has loose stools for the last one month. She complains of genital itching and discharge. She has pallor and bulging eyes. Her BP is 140/100 mm Hg. On vaginal examination, a curd-like discharge and haemorrhagic spots are seen on peeling the white layer. On investigations, her Hb is 8 g%, proteinuria is 1+, ELISA is reactive for HIV.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

6. Neelamma, a 17 year old primi in her seventh month, has headache, vomiting and high fever on and off with chills for the last one week. She also has abdominal pain and swollen legs and face. On examination, you discover pallor and signs of jaundice but no abdominal tenderness. Her BP is 180/110 mm Hg. Her Hb is 6 g%. The peripheral smear is positive for malarial parasites. The HBsAg test is also positive. But her scan report shows no abnormality.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

7. Yallamma, 22 years, G4P3L3, is in her eighth month. She has easy fatiguability and breathlessness while doing routine housework for the past 15 days. Her Hb is 6.5 g% and RBS is 240.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

8. Sharanamma, 27 years, G5P4L3, is in her eighth month. She was diagnosed with high BP a month ago and put on treatment. Since this morning, she has a bleeding PV, abdominal pain and no foetal movements. The abdomen is tense and tender. There are no contractions.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

9. Ratnamma, 29 years, G4P3L2, is 8.5 months pregnant and is 145 cm tall. For the past 15 days, she has swollen lower limbs. For the past eight days, she has facial puffiness and oedema on the abdominal wall. For the past two days, she has breathlessness.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

10. Devamma, 22 years, G2P1L1, with eight months amenorrhoea has a history of high BP and fits in her previous pregnancy. She has swelling of the lower limbs for the past 10 days. She has a headache and blurred vision since yesterday.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

11. Yankamma, 19 years, G2P0A1L0, with five months amenorrhoea, has pain in both lower limbs but no swelling.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

12. Durgamma, 34 years, G4P2A1L1, with seven months amenorrhoea, has fever, swollen limbs, burning micturition and abdominal pain for the past four days. Her BP is 130/86 mm Hg, Hb is 11 g%, proteinuria is 2+ and RBS is 210.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

13. Mariamma, 39 years, G6P4A1L3, has six months amenorrhoea. She has no perceptible foetal movements, swelling of the lower limbs, facial puffiness and high BP.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

14. Rudramma, 24 years, G2P1L1, has abdominal pain and bleeding PV in her fourth month of pregnancy. Her last-born child is three years old. A PV examination revealed a closed os. She is pale and has a BP of 150/100 mm Hg. Her Hb is 9 g%.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

15. Renuka, 19 years, 136 cm tall, G2P1L1 is in her eighth month of pregnancy. Her BP is 140/94 mmHg but she has no swelling of the lower limbs. Her Hb is 10 g% and urine proteins are 1+.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

16. Parvathi, 34 years, G6P4A1L3 is in her sixth month of pregnancy. Her last-born child is a year and nine months. She suffers from easy fatigability. She has pallor and swelling of the lower limbs.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

17. Jyothi, a 28 year old G6P5A0L4 with seven months amenorrhoea, has yellowish discolouration of the eyes with abdominal pain and nausea. She has not been coming regularly for ANC check ups. On examination, you notice bruises on her arms. On further probing, she tells you that her husband beat her.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

18. Kempamma, aged 18 delivered two weeks ago. She has not breastfed the baby, as she believes the production of milk is insufficient. She complains of pain in the left breast, which is swollen.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

19. Annapurna, G3P2L2, is 24 years old. She lost both children from previous pregnancies. A known diabetic, she is on treatment for the past two years. Her height is 150 cm. Although she is in her seventh month, she looks as if she is nine months pregnant. On examination, the fundal height is found to be of 34 weeks but the foetal parts are not easily palpable suggesting excessive fluid. Her Hb is 8g%, ELISA for HIV is non reactive; FBS is 150 mg% and PPBS is 220 mg%.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

20. Kempamma, sixth gravida, is 28 years old. She has four living children. She is now seven months pregnant. Her eyes look pale. She has swollen limbs and tender hepatomegaly. She has breathlessness and cough. On examination, her BP is 160/100 mm Hg. There are basal crepitations. Her Hb is 6 g%.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

21. Shivamma, aged 26, is now in the eighth month of her second pregnancy. She has swollen lower limbs even after 12 hours of rest, and facial puffiness.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

22. Mariamma, sixth gravida, is 39 years old. She had one miscarriage. Another child died. She is now in the sixth month of pregnancy. She does not feel foetal movements, has high BP and swollen lower limbs and face.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

23. Kusuma is 26 years old. She delivered her third child 15 days ago. There was heavy bleeding after delivery. Four days ago, she developed fever. She has foul-smelling vaginal discharge as well. She has breathlessness. Her eyes look yellow.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

24. Yallamma was married at the age of 15 and is now 22 years old. She has three children aged six years, four years and 15 days. She has started talking irrelevantly since the past week. She becomes violent and shouts at everyone.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

25. Neelamma is a pale looking 17 year old primi in her sixth month of pregnancy. She has breathlessness and cough on and off. She has constipation, swollen lower limbs and BP of 130/86 mm Hg. On taking a detailed history, you learn that she was diagnosed with a heart disease in her early childhood. On examination, you record a pulse of 50 per minute. You notice that her swelling is non-pitting. Her blood test reveals an Hb of 8.5 g%

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

26. Sharanamma, aged 27, is in the eighth month of her fifth pregnancy. Today, she suddenly started bleeding heavily, but has no abdominal pain.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

27. Nagamma, a 16 year old primi, is in her ninth month. Her height is 135 cm. Her membranes ruptured a day ago. She does not have any abdominal pain. She stopped feeling foetal movements yesterday.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

28. Devamma, aged 22, is in the eighth month of her second pregnancy. In her first pregnancy, she had high BP and fits. She has swollen lower limbs for the past 10 days. She has a headache and blurred vision since yesterday. She now has upper abdominal pain.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

29. Gangamma, aged 31, is in the fourth month of her fifth pregnancy. She had five previous deliveries, which were normal. She has just received her first ANC check-up. The doctor told her she is fine.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

30. 24 year old Rudamma is brought to you in the second month of her second pregnancy. She has abdominal pain, spotting and burning micturition. She felt giddy before fainting at the health centre. On examination, you discover cervical tenderness and lower abdominal tenderness.

i) PREDISPOSING FACTORS+ CONTEXT

ii) SYMPTOMS+ SIGNS+ TEST RESULTS

iii) INITIAL DIAGNOSIS

EXERCISE 2:

TRUE / FALSE STATEMENTS

Mark each of the following statements as True/False, identify the situations in which they would be so, and provide reasons for your answers.

(For answers to these questions, please refer to page 220.)

1. Nausea and vomiting in the first trimester connote risk.

TRUE

FALSE

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.....
.....

2. Twin pregnancy is a risk.

TRUE

FALSE

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.....
.....

3. High BP identified during the third month of pregnancy points to PIH.

TRUE

FALSE

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.....
.....

4. Recurring headaches in pregnancy point to risk.

TRUE

FALSE

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.....
.....

5. Bleeding in pregnancy is a risk only when it is associated with abdominal pain.

TRUE

FALSE

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.....

6. Tightening of the abdomen is a risk.

TRUE

FALSE

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.....
.....

7. Diabetes is always a co-morbid risk condition.

TRUE

FALSE

.....
.....
.....
.....

8. Abdominal pain in pregnancy is a risk.

TRUE

FALSE

9. Leaking PV (rupture of membranes) is a risk.

TRUE

FALSE

10. Hb of 8 g% should be considered a risk, even in the absence of other symptoms.

TRUE

FALSE

11. A woman is now in the sixth month of her third pregnancy. Her second child is two years old. Her pregnancy is at risk.

TRUE

FALSE

12. Presenting symptoms are always the most important indicators of an underlying risk condition.

TRUE

FALSE

13. A multi-parous woman has had a normal delivery. The uterus is well contracted but she develops PPH. A tear is likely to have caused the PPH.

TRUE

FALSE

14. A primi of 39 weeks complains of sharp abdominal pain. On examination, she is found to be in shock, with a tense and tender uterus and no vaginal bleeding. The probable diagnosis is uterine rupture.

TRUE

FALSE

15. A woman with irrelevant behaviour should always be referred to a psychiatrist.

TRUE

FALSE

16. Each symptom should be attributed to a different diagnosis.

TRUE

FALSE

17. All symptoms must always be attributed to a single diagnosis.

TRUE

FALSE

18. There is no hypotension in pre-eclampsia.

TRUE

FALSE

19. A woman with fever after delivery must be treated with antibiotics.

TRUE

FALSE

20. In severe PIH, woman may complain of the inability to see in the dark.

TRUE

FALSE



EXERCISE 1: ANSWERS

CASE STUDIES

1. i) 16 years (teenage pregnancy), eighth month of pregnancy
- ii) • Cough of more than three weeks, fever in the nights and insufficient weight gain [TB]
• Swelling of both limbs, fits, loss of consciousness [Eclampsia]
- iii) TB and eclampsia



2. i) 40 years (elderly pregnancy), eighth pregnancy (multi-parity), home delivery
- ii) • Excessive sweating and breathlessness half an hour after delivery of the placenta
- iii) PPH in shock



3. i) 18 years (teenage pregnancy), 15 days postpartum
- ii) • Fever, painful and swollen breast [Breast abscess]
• Not eating well, not taking care of the baby [Postpartum depression]
- iii) Breast abscess and postpartum depression



4. i) Home delivery
- ii) • Excessive bleeding after delivery, breathlessness [Severe anaemia]
• Fever, foul-smelling vaginal discharge, yellow discolouration of the eyes, breathlessness [Puerperal sepsis]
- iii) Severe anaemia, puerperal sepsis and possibly multi-organ failure



5. i) Eighth month of pregnancy
- ii) • Loose stools, features suggestive of STI, and positive ELISA. [HIV]
• Swelling of the limbs, BP of 140/100 and proteinuria [PIH]
• Loose stools, anxiety, palpitations and high BP [Hyperthyroidism]
• Genital itching, curd-like discharge and haemorrhagic spots on peeling [Candida vaginitis]
• Swelling of the limbs with a lowered Hb of 8 g% [Anaemia]
- iii) Discharge causing vaginitis (candida) with HIV, PIH, hyperthyroidism, moderate anaemia



- 6.** i) 17 years (teenage pregnancy), primigravida, seventh month of pregnancy
- ii) • Headache, vomiting, high fever on and off with chills, pallor, jaundice and positive peripheral smear [Malaria]
• Headache, vomiting, abdominal pain, swelling of the legs and face, high BP [Severe PIH]
• Low Hb, swelling of the legs and face [Severe anaemia]
• Abdominal pain, jaundice and positive HBsAg [Hepatitis B]
- iii) Malaria with severe anaemia, and with PIH and hepatitis B



- 7.** i) Fourth gravida, eighth month of pregnancy
- ii) • Easy fatiguability, breathlessness while doing routine housework, Hb of 6.5 g% [Severe anaemia]
• Easy fatiguability with RBS of 240 [Gestational diabetes]
- iii) Severe anaemia and gestational diabetes



- 8.** i) Fifth gravida (multi-parity), eighth month of pregnancy, known case of PIH
- ii) • Abdominal pain, vaginal bleeding, tense and tender abdomen in the absence of uterine contractions [Placental abruption]
• No foetal movements [Possible IUD]
- iii) PIH, placental abruption and possibly IUD.



- 9.** i) Fourth pregnancy in the ninth month
- ii) • Swollen lower limbs, facial puffiness, oedema on the abdominal wall and breathlessness
- iii) PIH and/or severe anaemia



- 10.** i) Eighth month of pregnancy, history of high BP and fits in her previous pregnancy
- ii) • Swelling of the lower limbs, headache, blurred vision
- iii) Imminent eclampsia



- 11.** i) Fifth month of pregnancy
- ii) • Pain in both lower limbs without swelling
- iii) Simple muscle ache



- 12.** i) Seventh month of pregnancy
- ii) • Fever, burning micturition and abdominal pain [UTI]
• Swollen limbs and proteinuria even in the absence of high BP [PIH]
• Urinary infection with increased RBS [Gestational diabetes]
- iii) UTI, PIH, gestational diabetes.

- 13.** i) 39 years (elderly pregnancy), sixth pregnancy (multi-parity), sixth month of pregnancy
- ii) • Lack of foetal movements, swelling of the lower limbs, facial puffiness and high BP
- iii) PIH with possible IUD



- 14.** i) Fourth month of pregnancy
- ii) • Pain abdomen, vaginal bleeding with closed os. [Threatened miscarriage]
- High BP identified before 20 weeks of pregnancy [Chronic hypertension]
- Pallor with Hb of 9 g% [Moderate anaemia]
- iii) Threatened miscarriage with chronic hypertension and moderate anaemia



- 15.** i) Height of 135 cm. ("too short"), eighth month of pregnancy
- ii) • High BP, proteinuria [PIH]
- Hb of 10 g% [Mild anaemia]
- iii) PIH with mild anaemia



- 16.** i) Sixth pregnancy (multi-parity), last child is 1 year 9 months (poor spacing)
- ii) • Easy fatiguability, pallor, swelling of the lower limbs.
- iii) Anaemia



- 17.** i) Sixth pregnancy (multi-parity)
- ii) • Yellow discolouration of the eyes, abdominal pain and nausea [Hepatitis]
- Missing ANC visits, bruises on her arms [Domestic violence]
- iii) Hepatitis, domestic violence



- 18.** i) 18 years (teenage pregnancy)
- ii) • Breast pain, breast swelling.
- iii) Breast abscess/mastitis



- 19.** i) Known diabetic, loss of children from previous pregnancies, seventh month of pregnancy
- ii) • Big abdomen with excessive fluid (Hydramnios)
- Big abdomen, increased values of FBS and PPBS (Diabetes)
- iii) Hydramnios in a woman with pre-existing diabetes

- 20.** i) Sixth pregnancy (multi-parity) in the seventh month
- ii) • Pallor, swollen limbs, tender hepatomegaly, cough, breathlessness, basal crepitations, Hb of 6 g% [Severe anaemia in heart failure]
• Swollen limbs, high BP (160/100 mm Hg) and breathlessness [Severe PIH]
- iii) Severe PIH with severe anaemia in heart failure



- 21.** i) Eighth month of pregnancy.
- ii) • Facial puffiness, swelling of the lower limbs even after 12 hours of rest.
- iii) Needs further evaluation. Probably anaemia and/or PIH



- 22.** i) 39 years (elderly pregnancy), sixth pregnancy (multi-parity), bad obstetric history
- ii) • Lack of foetal movements, swelling of the lower limbs and face, high BP.
- iii) PIH and probable IUD



- 23.** i) Bleeding after delivery
- ii) • Foul-smelling vaginal discharge, fever, yellowish discolouration of the eyes [Puerperal sepsis]
• Excessive bleeding, breathlessness [Severe anaemia]
- iii) Puerperal sepsis and severe anaemia in cardiac failure (brought on by postpartum bleeding)



- 24.** i) History of multiple pregnancies at short intervals, postpartum
- ii) • Irrelevant talk, violent speech and behaviour
- iii) Puerperal psychosis



- 25.** i) 17 years (teenage pregnancy); diagnosis of heart disease in early childhood
- ii) • Cough and breathlessness in a pregnant woman diagnosed with heart disease [Heart disease in pregnancy]
• Constipation, non-pitting oedema, decreased pulse rate (50 per minute) [Hypothyroidism]
• Pallor with lowered Hb of 8.5%
- iii) Heart disease in pregnancy with moderate anaemia and hypothyroidism



- 26.** i) Fifth pregnancy (multi-parity), eighth month of pregnancy
- ii) • Painless vaginal bleeding
- iii) Placenta previa



- 27.** i) 16 years (teenage pregnancy), height of 135 cm ("too short"); ninth month of pregnancy.
- ii) • Ruptured membranes before the onset of labour pains [PROM]
• Lack of foetal movements [Possible IUD]
- iii) PROM, possibly with IUD



- 28.** i) High BP and fits in the previous pregnancy, eighth month of pregnancy
- ii) • Swollen lower limbs, headache, blurred vision, upper abdominal pain
- iii) Imminent eclampsia



- 29.** i) Five previous deliveries (multi-parity)
- ii) None
- iii) Difficult to say with this information.

- 30.** i) Within two months of pregnancy
- ii) • Abdominal pain, spotting, giddiness, fainting, abdominal tenderness and cervical tenderness [Ectopic pregnancy]
• Burning micturition [UTI]
- iii) Ectopic pregnancy and UTI



EXERCISE 2: ANSWERS

TRUE / FALSE STATEMENTS

- 1. True,** if the woman is unable to eat or drink and shows signs of dehydration with ketonuria. If not, she is not at risk.
- 2. True.** A woman with a twin pregnancy is at higher risk for miscarriage, pre-eclampsia, diabetes and anaemia. Although these complications are relatively rare, it is important for a doctor and staff nurse to be aware of them. Most complications associated with twin pregnancies can be detected during the antepartum period, so it is important to monitor the woman's health and be alert to symptoms of risk.
- 3. False.** PIH typically emerges only after 20 weeks of pregnancy. High BP identified in the third month points to chronic hypertension. Conditions like chronic hypertension can occur before pregnancy and continue into pregnancy.
- 4. True.** Recurring headaches signify a serious problem that merits a detailed medical examination. Even one bad headache in the second or third trimester must be taken seriously. A woman reporting such a headache in her second or third trimester must be examined *even if she does not have blurred vision, swollen hands and face, sudden weight gain, nausea or sharp upper abdominal pain*. Her BP and urine must be checked immediately to rule out pre-eclampsia. If the headache occurs in the second or third trimester in association with other symptoms and signs of PIH (high BP, swelling, proteinuria), it would point to impending eclampsia.
- 5. False.** Painless bleeding is a classical feature of placenta previa. It is a life-threatening event and needs emergency intervention.
- 6. False.** It is common to feel tightening of the abdomen from the fifth month of pregnancy. These are called Braxton Hicks contractions. But if tightening of the abdomen is associated with abdominal pain, tenderness and lack of foetal movements, it could indicate placental abruption with IUD.
- 7. True,** but not always. Sometimes, diabetes can also develop because of pregnancy. This is called gestational diabetes. It usually subsides just after delivery, but may continue, in rare instances, as chronic diabetes.
- 8. True.** Abdominal pain in the first trimester indicates threatened abortion. When accompanied by giddiness and shoulder pain, it indicates an ectopic pregnancy. During the second trimester, upper abdominal pain can be caused by gastritis. It can also be brought on by miscarriage or preterm labour. As pregnancy advances, abdominal pain could mean pre-eclampsia, placental abruption or uterine rupture. If abdominal pain is accompanied by backache, a small amount of bleeding and cervical dilatation, it would indicate labour pain.
- 9. False,** as leaking PV is a normal process during labour. True, if there is leaking before the onset of labour. PROM extending for 18-24 hours or more puts a woman at risk of intrauterine infection, chorioamnionitis and delayed placental expulsion.
- 10. True.** An Hb reading of 7-9 g% connotes moderate anaemia. If left untreated, moderate anaemia can worsen, and lead to congestive heart failure, maternal exhaustion or contribute to PPH.
- 11. True.** As the spacing between her present and previous pregnancies is less than two years (the minimum recommended gap), the chances of her developing anaemia are high.
- 12. False.** Presenting symptoms do indicate an underlying condition. But a doctor or staff nurse should not rely completely on presenting symptoms to make a diagnosis. Some conditions such as HIV and gestational diabetes can be symptom-free. Further, in places where risks are not recognised or taken seriously, they can be unreported. Given this, a thorough clinical evaluation (consisting of a detailed history, physical examination and appropriate tests) should guide the process of risk identification.

13. **True.** A well contracted uterus rules out atonic PPH. If the expelled placenta is intact, a well contracted uterus would rule out PPH due to retained placental bits as well. In such situations, PPH with a well contacted uterus would confirm the presence of a tear.
14. **False.** Findings from the clinical examination (particularly that of a tense and tender abdomen) support a diagnosis of placental abruption, rather than of uterine rupture.
15. **False.** The irrelevant behaviour can be due to psychiatric or non-psychiatric causes. Non-psychiatric causes include sepsis and CVT. In these cases, a psychiatric reference is unhelpful.
16. **False.** Generally, all symptoms in a woman must be considered together to identify one or more underlying conditions.
17. **False.** Not always. Generally, an effort should be to make a single diagnosis that can explain all symptoms. However, when it becomes impossible to explain all symptoms through one diagnosis, more than one diagnosis would be needed.
18. **True.** PIH is associated with hypertension, not hypotension. However, if a woman with PIH has IUD, then hypotension is possible.
19. **False.** Fever after delivery can occur for of many reasons, including CVT, which is not linked to an infection. Antibiotics are helpful only when the illness is due a bacterial infection.
20. **False.** This is night blindness unrelated to PIH. In severe PIH, there can be blurred vision, but this would be a problem even during the day.



FURTHER READINGS AND INDEX



FURTHER READINGS

Banerjee, S. 2011. Thyroid Disorders in Pregnancy. *Supplement to JAPI 59*: 32-34 http://www.japi.org/thyroid_special_jan_issue_2011/thyroid%20disorders%20in%20pregnancy.pdf

Bhattacharya, P.C., and Nayak. M. 2011. Malaria in Pregnancy. *Medicine Update 21*: 475-478 http://www.apiindia.org/pdf/medicine_update_2011/84_malaria_in_pregnancy.pdf

Cunningham, F.G. et al. (Eds.) 2014. *William's Obstetrics 24th Edition*. New York: McGraw Hill Medical.

Glynn, M., and Drake. W. (Eds.) 2012. *Hutchison's Clinical Methods 23rd Edition*. Edinburgh: Elsevier.

Gopalan, S., and Jain. V. (Eds.) 2011. *Mudaliar and Menon's Clinical Obstetrics 11th ed*. Hyderabad: Universities Press.

IIPS (International Institute of Population Sciences). Undated. *District Fact Sheet Koppal (2007-08)*. District Level Household and Facility Survey-3. New Delhi: Ministry of Health and Family Welfare. Government of India.

IIPS. Undated. *District Fact Sheet Koppal (2012-13)*. District Level Household and Facility Survey-4. New Delhi: Ministry of Health and Family Welfare. Government of India.

Klein, S., S. Miller, and F. Thomson. 2010. *A Book for Midwives*. Berkeley: Hesperian Foundation.

Konar, H. ed. 2013. *D. C. Dutta's Textbook of Obstetrics 7th Edition*. New Delhi: Jaypee Brothers.

MOHFW (Ministry of Health and Family Welfare) Government of India. 2010. *Skilled Birth Attendance: A Handbook for Conducting Training of Auxiliary Nurse Midwives Lady Health Visitors Staff Nurses*. New Delhi: MOHFW, Government of India. http://www.nrhm.gov.in/images/pdf/programmes/maternal-health/guidelines/sba_handbook_for_anm_lhv_sn.pdf

MOHFW, Government of India. 2010. *Skilled Birth Attendance: Trainer's guide for Conducting Training of Auxiliary Nurse Midwives Lady Health Visitors Staff Nurses*. New Delhi: MOHFW, Government of India. http://www.nrhm.gov.in/images/pdf/programmes/maternal-health/guidelines/sba_handbook_for_anm_lhv_sn.pdf

MOHFW, Government of India. 2014. *National Guidelines for Diagnosis and Management of Gestational Diabetes Mellitus*. New Delhi: MOHFW, Government of India. http://www.nrhm.gov.in/images/pdf/programmes/maternal-health/guidelines/National_Guidelines_for_Diagnosis_&_Management_of_Gestational_Diabetes_Mellitus.pdf

MOHFW, Government of India. 2014. *Screening for Syphilis during Pregnancy: Technical and Operational Guidelines*. New Delhi: MOHFW, Government of India. http://www.nrhm.gov.in/images/pdf/programmes/maternal-health/guidelines/Syphilis_Doc_Low-res_5th_Jan.pdf

MOHFW, Government of India. Undated. *Induction Training Module for ASHAs*. New Delhi: MOHFW, Government of India. http://nrhm.gov.in/images/pdf/communitisation/asha/ASHA_Induction_Module_English.pdf

National AIDS Control Organization and MOHFW, Government of India. 2007. *National Guidelines on Prevention and Management of Reproductive Tract Infections Including Sexually Transmitted Infections*, http://naco.gov.in/upload/STI%20RTI%20services/National_Guidelines_on_PMC_of_RTI_Including_STI%20I.pdf

Park, K. 2015. *Park's Textbook of Preventive and Social Medicine*. Jabalpur: Banarsidas Bhanot.

The Criteria Committee for the New York Heart Association. 1994. *Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Great Vessels* (9th ed). Boston: Little, Brown & Co.

The Gazette of India. 2005. *The Protection of Women from Domestic Violence Act 2005 No. 43 of 2005*. <http://wcd.nic.in/wdvact.pdf>

WHO, UNFPA, UNICEF and World Bank. 2000. *Managing Complications in Pregnancy and Child Birth; A Guide for Midwives and Doctors*; Geneva: WHO. http://whqlibdoc.who.int/publications/2007/9241545879_eng.pdf

WHO. 2000. *Mastitis: Causes and Management*. Geneva: WHO. http://whqlibdoc.who.int/hq/2000/WHO_FCH_CAH_00.13.pdf?ua=1

WHO. 2003. *Pregnancy, Childbirth, Postpartum and Newborn Care: A Guide for Essential Practice*. Geneva: WHO. http://www.afro.who.int/index.php?option=com_docman&task=doc_download&gid=2011

WHO. 2010. *WHO Recommendations for Prevention and Treatment of Pre-eclampsia and Eclampsia*. Geneva: WHO. http://whqlibdoc.who.int/publications/2011/9789241548335_eng.pdf

WHO. 2012. *Understanding and Addressing Violence Against Women; Health Consequences*. Geneva: WHO. http://apps.who.int/iris/bitstream/10665/77431/1/WHO_RHR_12.43_eng.pdf

WHO. 2012. *WHO Recommendations for the Prevention and Treatment of Postpartum Haemorrhage*. Geneva: WHO. http://apps.who.int/iris/bitstream/10665/75411/1/9789241548502_eng.pdf?ua=1

WHO. 2013. *Responding to Intimate Partner Violence and Sexual Violence Against Women; Clinical and Policy Guidelines*. Geneva: WHO. http://apps.who.int/iris/bitstream/10665/85240/1/9789241548595_eng.pdf?ua=1



INDEX

In this index, we list out key symptoms, signs and risk conditions that feature in Part 1 of the handbook. We indicate the pages in which these terms are explained in any detail or are critical to any risk condition that is being discussed.

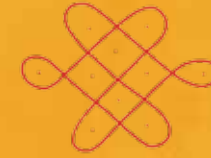
Abdominal pain	40, 45, 55, 56, 57, 59, 61, 65, 78, 80, 82, 96, 97 , 99
Abortion	5, 11, 55, 65 , 96, 97, 99, 103, 111 , 125 (also see 'miscarriage')
Abruptio placentae	5, 61 , 96, 97, 107
Altered behaviour	45, 65, 98, 100 , 131
Anaemia	5, 9, 16, 17, 18, 52, 53, 57 , 98, 100, 105 , 124, 128, 129
APH	61, 62, 108
Beating	49, 72
Blebs	48, 81
Bleeding	6, 7, 33, 40-44, 47, 55-56, 61-62, 64-65, 81, 96-97 , 103-104, 108, 110, 124, 129
Blurred vision	40, 48, 59, 91
Body ache	49, 86
BP	8, 10, 32, 41, 44, 46, 49, 53, 56, 58-59, 61-62, 64, 66, 90, 93, 97-98, 100-101, 106
Breast abscess	5, 68, 99, 112
Breathlessness	40-41, 44-46, 48, 57, 64, 76, 89, 94, 99-100
Bruises	50, 72, 114
Bulging eyes	50, 90
Burning micturition	48, 74, 99
Cardiac murmurs	5, 41, 47, 50, 94, 100
Chancroid	5, 80- 81 , 117
Chest pain	48, 76, 99-100
Chills	43, 49, 64, 74-75, 99
Chlamydia	6, 80, 82, 117
Chorioamnionitis	6
Coagulation failure	42, 47, 60-61, 63, 66, 107

Cold and clammy extremities	41, 44, 47, 50, 61, 64, 96	Heart disease	39, 94 , 100, 121-122 , 124, 128
Constipation	89	Heart failure	57, 94, 100
Convulsion	6-7, 10, 40, 43, 45, 58-59, 67, 106 40, 45, 48, 57,	Hepatitis	8 , 33, 50, 84 , 118
Cough	59, 76, 99-100	Hepatomegaly	(see 'enlarged liver')
Crepitations	41, 47, 50, 57, 59, 94	Herpes	39, 51, 81 , 85, 119
Crying without provocation	46, 71	HIV	7, 9 , 33, 39, 50, 83 , 119
CVT	5 , 15, 67 , 98-100, 111 , 130-131	Hoarse voice	48, 89
Cytomegalovirus infection	39, 51, 85- 86 , 119	Hydramnios	8 , 10
Decreased air entry	50, 76	Hyperemesis gravidarum	54 , 103
Diabetes	6 , 39, 91 , 120	Hypertension	8 , 10 , 39, 58 , 93 , 106 , 121
Diarrhoea	48, 75, 83, 90, 118, 130	Hyperthyroidism	89- 90 , 120
Domestic violence	6 , 15, 72 , 114	Hypothyroidism	89 , 120
Dry skin	50, 89	Imminent eclampsia	58-59 , 106 , 127
Dry tongue	41, 50, 54	Increased appetite	48, 90-91
Eclampsia	6 , 38, 58-59, 106, 127	Increased urge to urinate	48, 74
Ectopic pregnancy	6 , 53, 56 , 96, 104	Injury marks	46, 50, 70-72
Enlarged liver	8 , 41, 47, 50, 84	Intolerance to heat or cold	49, 89-90
Enlarged lymph nodes	9 , 41, 47, 50, 85, 99	Irritability	46, 49, 69, 91
FBS	50, 92	IUD	60-61 , 107
Feelings of shame/guilt/inadequacy	46, 69	Jaundice	39, 66, 84, 100 (also see 'yellowish discolouration')
Fever	40, 45, 49, 60, 63, 65, 67, 68, 74, 76, 82, 84, 86, 96, 99-100 , 109	Joint pain	49, 86
Forced sex	49, 72	Ketonuria	8 , 54
Frequent infections	49, 91	Leaking PV	33, 42, 63, 99
Frequent urination	74, 91, 99	Liver enzyme	42, 47, 66
Genital itching	33, 48, 78-79, 81	Loss of appetite	46, 48, 69, 76, 84, 86
Giddiness	40, 48, 56, 59, 62, 93	Loss of consciousness	40, 43, 45, 58-59, 64, 67
Gonorrhoea	7, 51, 81-82	Loss of joy in life	46, 69
Haemoglobin (Hb)	7, 34, 42, 47, 50, 57, 66, 75, 98, 100, 105 , 128	Lymphadenopathy	(see 'enlarged lymph nodes')
Hallucinations	46, 71, 100	Malaria	9-10 , 34, 50, 75 , 99, 116
Headache	9, 11, 40, 43, 45, 48, 59, 67, 75, 86, 93, 98-100 , 127	Mastitis	9 , 32, 68 , 99, 112
		Miscarriage	9 , 11, 29, 39, 55 , 65, 96-97, 103 (also see 'abortion')
		Mood swings	46, 69

Muscle ache	49, 75, 85, 99	STI	11, 34, 39, 48, 78-81 , 83, 117
Muscle weakness	49, 90	Strawberry cervix	50, 78
Nausea	9, 48, 75, 82, 84, 98	Suicidal thoughts	46, 49, 69-73
Nervousness	49, 90	Sunken eyes	41, 49, 54
Night sweats	49, 76, 99	Sweating	43, 64, 75, 96
Oedema	41, 44, 47, 50, 57-59, 100 (also see 'swelling')	Swelling	40, 43, 45, 47-48, 57-58, 68, 93, 98-99 , 126 (also see 'oedema')
Pain in the flanks	48, 74	Syphilis	11, 12, 33, 80-81, 85, 117 , 119
Pallor	9 , 41, 44, 46, 49, 57, 64, 75, 98, 100	Temperature	32, 41, 46-47, 49, 60, 63, 66-68, 74-75, 101
Palpitation	9 , 48, 90, 94	Tenderness	11, 47, 68, 82
PIH	10 , 58 , 106 , 121, 124, 126-127	Tension	49, 90
Placenta previa	10 , 62 , 96, 108, 129	Thirst	40, 48, 54, 91
Placental abruption	(see 'abruptio placentae')	Thrombosis	5, 11 , 34, 67, 98, 111, 126
Poor wound healing	49, 91	Tingling and numbness	48, 81
Postpartum depression	6, 69 , 91, 113, 131	Tiredness	40, 43, 49, 54, 57, 64, 75, 94, 98-100,
Postpartum psychosis	10 , 18, 71 , 100, 113	Toxoplasmosis	12 , 85 , 87 , 119
PPBS	50, 92	Tremors	48, 90
PPH	7, 52, 64 , 96, 110 , 129	Trichomoniasis (or Tric)	12 , 78 , 117
Pre-eclampsia	10 , 58 (also see 'PIH')	TB	12 , 34, 76 , 99, 116, 118
PROM	10 , 63 , 99, 109	Ulcer	12 , 48, 50, 80-81
Proteinuria	10 , 42, 58-59, 97-98, 100, 106	Urine output	32, 40-41, 44, 46, 54, 59, 66, 100-101, 106
Pus	47, 68	USG	29, 34, 42, 55-56, 60-62, 109
Pus cells	51, 74	UTI	74 , 99, 115 , 130
RBS	92	Vaginal discharge	45, 48, 65, 78-80, 82,
Raised WBC count	42, 47, 50, 63, 66, 68, 74	Vomiting	40, 48, 54, 75, 97-99, 103
Reduced sleep	46, 69	Weakness	49, 76
Refusal to feed the baby	46, 71,	Weight gain	40-41, 48-49, 58, 89,
Retroplacental clot	10 , 42, 61	Weight loss	48, 76, 83, 90, 99,
Rubella	39, 51, 85-86 , 119	Yellowish discolouration	41, 46, 51 (also see 'jaundice')
Sepsis	10 , 11 , 18, 60, 63, 65 , 97, 99-100, 111 , 131		
Septic abortion	11 , 65 , 96-97, 99, 111		
Skin rash	49, 85		
Spotting	40, 56, 61, 108		
Sputum	34, 51, 77		



NOTES



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