Basic Antenatal Care

Handbook

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Preface

The aim of this handbook is to provide the knowledge to perform basic antenatal care (BANC) effectively. This handbook has been designed after a series of interviews and focus groups with health care providers working in primary health care clinics, often where there were no practicing midwives. These interviews and focus groups were designed to understand current problems health workers experience when providing antenatal care and use this information to plan the workbook.

Overwhelmingly the health care providers asked for a programme based on the learning principles used in Integrated Management of Childhood Illnesses (IMCI) programme. There were numerous requests for flow diagrams and protocols for care designed like IMCI. All clinics also requested that obstetric emergencies be included as often they are the first point of call of a critically ill woman.

This handbook is not intended to replace any existing programme but aims to bring together all these resources and facilitate their use. The handbook is part of a BANC quality improvement package that includes:

- Basic Antenatal Care Handbook
- The Integrated Management of Pregnancy and Childbirth programme of the WHO (adapted for the Tshwane Metropole in cooperation with Tshwane Metropolitan Municipality and Tshwane/Metsweding Regional office of Gauteng Province, the Obstetrics and Gynaecology Department of the University of Pretoria and the MRC Maternal and Infant Health Care Strategies Research Unit). This programme provides the flow charts in the IMCI format.
- A training CD on basic skills needed for antenatal care.
- BANC Facilitators Guideline to Training of Trainers.
- BANC Training of Trainers file.
- BANC Task Book.
- Primary Health Care Facility's Manager's information leaflet.

As references:

- The Perinatal Education Programme (PEP). This functions as a reference work for BANC. Ideally once BANC is established those interested should progress to undergo the PEP training.
- Guidelines for Maternity Care in South Africa: A manual for clinics, community health centres and district hospitals
- Standard Treatment Guidelines and Essential Drug List for Primary Health Care
- Gauteng Antenatal Care Policy
- Saving babies 2003: The fourth perinatal care survey of South Africa
- Saving Mothers 1999-2001: Confidential Enquiries into Maternal Deaths in South Africa
- Fourth Interim report on Confidential Enquiries into Maternal deaths (including the national protocol for managing women with HIV infection)

The program is designed specifically for those primary health care facilities performing basic antenatal care, but can be used by any antenatal clinic providing

more advanced care to ensure each pregnant woman has the basic care also included and not overlooked.

The Basic Antenatal Care Handbook explains the process of providing antenatal care and explains the reasoning behind the guidelines presented. The process of providing antenatal care has been simplified and only interventions that are effective during the antenatal period are used and those that are not are excluded. All interventions have good evidence to support their use. All facilitators and trainers should read this handbook before running a training session.

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23rd November 2007

Contents

ISBN: 978-0-620-46272-3

Part 1 - Introduction to Basic Antenatal Care

Some useful definitions

Abortion: The definition used internationally is the loss of a baby born before 22 weeks gestation or weighing less than 500g. In South Africa the old definition is still used: the loss of a baby before 28 weeks (7 months gestation) or weighing less than 1000g. Babies born between 22 weeks and 28 weeks (5-7 months), or weighing 500g-999g are called late abortions.

Abruptio placenta: A bleed behind the placenta before the baby has been born. Abruptio placenta has a high perinatal mortality and is the most common cause of perinatal death in the metropolitan areas of South Africa. It is difficult to predict who will develop it, but women who smoke, have hypertension or have had a previous abruptio placenta are at higher risk. The women usually come to the clinic or hospital complaining of vaginal bleeding with clots and severe abdominal pain. This is an obstetric emergency.

Amniotic fluid infection: See page 35.

Anaemia: See page 25.

Antenatal period: The time from when a woman becomes pregnant until she goes into labour to deliver the baby.

Antenatal care (ANC): Health care provided to a woman in the antenatal period.

Asymptomatic bacteriuria: See page 35.

Body Mass Index (BMI): See page 25.

Congenital abnormality: See page 37.

Eclampsia: See page 23.

Expected date of delivery (EDD): The date on which it is expected that the baby will be born. It is calculated from the last normal menstrual period (LNMP) by adding 7 days to the date of the first day of the LNMP (to give the day), and then adding 9 months to the month (to give the month). If the LNMP is after March, you can subtract 3 from the month and add one to the year.

Fetus: An unborn baby.

Gestational age: It is how old the pregnancy is and is usually talked about in weeks. For example she is 20 weeks gestation.

Gravidity: The number of times the woman has been pregnant, including the current pregnancy. The pregnancy outcome is not important.

Hypertension: See page 23.

Intra-uterine growth restriction (IUGR): See page 27.

Low birth weight (LBW): See page 27.

Maternal death: The death of a pregnant woman during the pregnancy. The pregnancy is from conception until 6 weeks (42 days) after the birth of the baby. It includes deaths of women due to abortions or ectopic pregnancies, but does not include coincidental deaths, for example women dying due to motorcar accidents or assault. However, these deaths are still collected by the *National Committee for the Confidential Enquiries into Maternal Deaths* and are reported separately. It is a useful measure to determine the incidence of occurrences such as the abuse of pregnant women.

Maternal mortality ratio (MMR): The number maternal deaths (see above) divided by the number of live births. To make the figures easy to use they are multiplied by 100 000 - the MMR is expressed per 100 000 live births. The MMR is a figure that can be used to compare various places. A high rate is bad and a low rate is good. For example a developed country has a MMR of 10/100 000 live births; in South Africa that figure is about 200/100 000 live births.

Morbidity: Where damage occurs to the patient (mother or baby) but the patient does not die.

Mortality: The death of a patient.

Neonate: A baby that has been born alive. The baby is called a neonate for the first month (28 days) of its life.

Neonatal death: A baby born alive that dies within the first month (28 days) of life. An early neonatal death is a death within the first week (7 days). A late neonatal death is a death after the first week but before the end of the fourth week.

Parity: The number of times a woman has been pregnant in which the pregnancy has progressed as far as the baby being viable (28weeks gestation).

Perinatal death: A stillbirth or a neonatal death.

Perinatal mortality rate (PNMR): The number of perinatal deaths (see above) divided by the number of births. To make the figures easy to use they are multiplied by 1000 - the PNMR is expressed per thousand births. The PNMR is a figure that can be used to compare various places. A high rate is bad and a low rate is good. For example a developed country has a PNMR of 10/1000 births for babies weighing 500g or more; in South Africa that figure is about 55/1000 births. The PNMR for babies weighing 1000g or more in developed countries is about 5/1000 births; in South Africa it is about 40/1000 births. In South Africa the PNMR is used for babies over 1000g because there are not enough facilities to help all the babies born alive (neonates) under 1000g.

Placenta praevia: Where the placenta is positioned over the cervix (mouth) of the uterus (womb). When the cervix starts to open the woman begins bleeding vaginally. The placenta being torn away from the uterus causes the bleeding. The bleeding is usually painless and bright red. The condition is common and the bleeding can be very heavy; the woman can bleed to death very quickly. It is an obstetric emergency.

Post-maturity: See page 27.

Post-term: See page 27.

Pre-eclampsia: See page 23.

Pre-term: When the pregnancy is less than 37 completed weeks.

Pre-term labour: When a woman with a pre-term baby goes into labour. This is a common cause of low birth weight babies.

Premature neonate: A baby that has been born before 37 completed weeks of gestation. Premature neonates are very weak because they are immature and not all their organs have fully developed. Immaturity is major cause of neonatal death.

Premature rupture of membranes: When the membranes break more than 1 hour before the woman starts having contractions. If the pregnancy is pre-term, it is called *pre-term premature rupture of membranes*.

Proteinuria: See page 23.

Stillbirth: A baby born dead. It usually refers to babies weighing more than 500g.

Syphilis: See page 35.

Trimester: Pregnancy is divided into three time periods. The first trimester is the first 3 months (12 weeks), the second trimester is from 3 months to 7 months (12 weeks to 28 weeks), and the third trimester from 7 months (28 weeks) until the baby is born.

Upper mid-arm circumference (U-MAC): This measurement done by a tape measure of the upper arm in its middle gives a good indication of the body mass index, i.e. nutritional status of the woman.

Urinary tract infection (UTI): See page 35.

Vaginitis: See page 35.

What is antenatal care?

Antenatal care (ANC) is the health care of pregnant women in the months and weeks before the birth of their babies. The care is aimed at detecting those problems already present or those that can develop in the pregnant woman and her unborn child. Once detected, the problem can be treated. ANC has a further role of improving the general health of the woman. Not only is the pregnancy examined, but also the general health and habits of the woman. Interventions during pregnancy can have permanent beneficial effects later in the woman's life.

What can antenatal care achieve?

- Improve maternal health
- Improve the health and survival of the baby
- Provide the pregnant woman with information on:
  - Warning signs during pregnancy and how to respond
  - Bad habits such as drinking alcohol and smoking
  - Nutrition
  - Contraception
  - Feeding her infant
  - HIV

ANC can screen for, detect, and thus prevent many maternal complications occurring before childbirth. It can detect and treat anaemia, other chronic diseases such as tuberculosis, or complications of HIV infection and other sexually transmitted infections. It can also improve the nutritional status of the woman. This substantially improves the woman's chance of survival should a severe complication occur during pregnancy or childbirth. ANC cannot help to prevent some of the common causes of maternal death which occur during or after childbirth, which are often unpredictable, such as post-partum haemorrhage, ante-partum haemorrhage and puerperal sepsis

ANC can significantly improve the outcome of the unborn baby. It can allow detection and treatment of some of the maternal infections that are dangerous to the infant, of some maternal medical conditions such as diabetes mellitus that are harmful to the infant, and of complications arising in pregnancy such as pre-eclampsia or poor intra-uterine growth of the infant. Treatment and intervention may help to prevent the death of the infant.

Below is a table of conditions occurring during pregnancy that can be successfully detected and treated in ANC, thereby improving the health of the pregnant woman and the health and survival of the fetus.

Table 1. Conditions that can be successfully detected and treated in pregnancy

Maternal condition	Worst effect on pregnancy
Anaemia	More likely to bleed, smaller babies
Hypertension and pre-eclampsia	Convulsions, haemorrhage, maternal deaths, fetus/neonatal death
Medical diseases e.g. diabetes mellitus, epilepsy, heart disease	Maternal death; fetus/neonatal death
HIV complications	Maternal death; pre-term birth, growth impaired babies, HIV infected babies
Chronic infections e.g. tuberculosis	Maternal deaths; fetus/neonatal death
Urinary tract infections	Maternal kidney infection, pre-term labour, fetus/neonatal death
Vaginitis and other sexually transmitted infections	Pre-term labour, fetus/neonatal death
Malnutrition	Small babies
Fetal condition	
Poor fetal growth	Fetus/neonatal death
Post-maturity	Meconium aspiration, fetus/neonatal death
Congenital infections e.g. syphilis	Fetus/neonatal death
Congenital abnormalities	Fetus/neonatal death
Twins, triplets	Pre-term labour, fetus/neonatal death
Abnormal fetal lie	Ruptured uterus, fetus/neonatal death
Rhesus isoimmunisation	Anaemic neonate, fetus/neonatal death

Why should there be antenatal care in all health care clinics in South Africa?

In 1997 a maternal death became a notifiable condition. Deaths of all pregnant women, or those deaths occurring within six weeks of the woman giving birth, must be reported to the provincial departments of maternal and child health. The provincial MCWH units then inform the *National Committee for the Confidential Enquiries into Maternal Deaths*. Each death is assessed, and the cause, potential avoidable factors, missed opportunities and incidents of substandard care are recorded. The results of these enquiries have been detailed in the first and second **Saving Mothers: Confidential Enquiries in Maternal Deaths in South Africa** reports.

From these reports it is known that AIDS is the biggest killer of pregnant women in the country, followed by complications of hypertension in pregnancy, post-partum haemorrhage, pregnancy related sepsis (abortion and puerperal sepsis) and pre-existing medical conditions such as heart disease. Appropriate ANC can play a major role in preventing the deaths of pregnant women due to AIDS (and related conditions such as pneumonia, tuberculosis, meningitis and malaria), complications of hypertension and complications of pre-existing medical diseases. Further, by improving the health of the woman (for example correcting anaemia), women would be better able to withstand the complications of haemorrhage and sepsis.

South Africa also has good information regarding perinatal deaths. The fourth **Saving Babies: A perinatal care survey of South Africa** report details the most common primary obstetric causes of deaths of unborn and newborn babies. They are: unexplained stillbirths, spontaneous pre-term birth, intra-partum asphyxia and birth trauma, ante-partum haemorrhage and complications of hypertension. One in four perinatal deaths are recorded as unexplained stillbirths. Research has shown that these are likely to be caused by intra-uterine starvation (intra-uterine growth

restriction - IUGR), post-maturity, congenital abnormalities and intra-uterine infections. All of these causes can be detected, and some potentially prevented by antenatal care. Antenatal care can also reduce deaths due to hypertension in pregnancy, but unfortunately only has a limited impact on deaths due to spontaneous pre-term labour, intra-partum asphyxia and birth trauma, and ante-partum haemorrhage.

Effective antenatal care in South Africa can make a major contribution to improving the health of pregnant women, saving lives, and also significantly improving the health and survival of the unborn baby.

Where should basic antenatal care (BANC) be performed?

Every opportunity to see and treat pregnant women should be seized, and every site where pregnant women make contact with health services should be utilised. Thus all primary health care facilities should provide basic antenatal care (BANC). The more accessible the care is to the woman, the more likely it will be used. The national *Demographic and Health Survey (DHS)* shows that 94% of all pregnant women attend antenatal care at least once. However, antenatal care coverage is worst in the more rural and poor areas, and best in the urban areas. The aim of the Department of Health is for pregnant women to attend antenatal care four times, starting before 20 weeks gestation.

When should antenatal care start?

Antenatal care should start when the pregnancy is diagnosed. The sooner a pregnant woman is brought into the system, the earlier any problems can be detected. Treatment then has a greater chance of success.

Most women will confirm their pregnancy within the first three months of missing a menstrual period. Most women attend either to their local clinic or general practitioner. This means they make contact with the health services early in their pregnancy. This opportunity to initiate antenatal care should not be missed. The current structure of health services allows for immediate initiation of antenatal care. If the pregnancy test is done at the clinic or general practitioner's office, the first antenatal visit can be performed when the test result is given to the woman.

Earlier initiation of ANC does not result in an increased workload for the clinic, as new evidence shows that only 4 follow-up antenatal visits are required, rather than the 12 previously suggested. By starting ANC immediately, the clinic will actually save time, reduce the workload and improve the chances of a good outcome of the pregnancy.

Who should perform the antenatal care?

Research has shown that appropriately trained nurses, midwives, doctors or specialists all perform basic antenatal care equally well. Where complications are detected, the pregnant women are best seen and treated by specially trained midwives and doctors. This can be done in conjunction with the primary health care clinics.

How should basic antenatal care be performed?

Table 2 lists the effective interventions of the antenatal period. By detecting and treating the conditions in Table 2, pregnancy outcome will improve for both mother and child.

Each health care provider, after the greeting and rapid assessment and management (RAM), should follow the following clinical process at each antenatal:

- **Ask, check antenatal card**
- **Look, listen, feel**
- **Record signs**
- **Classify**
- **Treat and advise**
  All patients should receive or be checked at every visit
    Iron, folate and calcium (and multivitamins if indicated)
    Nutritional advice
    Advice on what to do if the warning signs in pregnancy appear
    Where she plans to give birth
    What transport arrangements have been made should she go into labour
- **Complete antenatal card and clinic checklist**
- **Make arrangements for the next visit**

Table 2. Effective interventions during the antenatal period

Problem	Prevention	Screen/diagnose	Treatment
Mother			
Anaemia	Iron and folate prophylaxis	Check haemoglobin	Iron and folate or iron injections or blood transfusion
Hypertension/pre-eclampsia	Calcium supplementation	Check blood pressure, urine	Treat hypertension
Syphilis	As for STIs	RPR, VDRL	Bicillin
Vaginitis	As for STIs	Syndromic approach	Erythromycin and metronidazole
Urinary tract infection	Personal hygiene	Urine dipsticks or urine culture	Ampicillin
HIV	As for STIs	Counselling and voluntary testing	Antiretroviral therapy for mother, PMTCT for fetus/neonate Multivitamin supplementation
Tuberculosis	TB prophylaxis where indicated	Chest X ray, sputum culture	Anti TB drugs
Malaria	Prophylaxis	Symptomatic treatment	Anti malarial drugs
Pre-existing medical conditions, Diabetes, heart disease, epilepsy		History and examination	Refer
Gestational diabetes mellitus		Family history, previous baby's birth weights, Glucosuria	Investigate, Treat as necessary or refer
Malnutrition	Balanced protein/calorie supplementation, multivitamin supplementation	History, clinical examination (Body/mass index) (Upper mid-arm circumference)	Refer social workers, Food supplementation
Fetus			
Poor fetal growth	Balanced protein/calorie supplementation, Advice on smoking	Uterine growth (serial symphysis-fundus measurements)	Timely delivery
Post-maturity	Accurate gestational age	Calculate gestational age	Induce labour at 41 weeks gestation
Multiple pregnancies	Careful assisted reproduction	Uterine growth, Sonar	Refer
Breech presentation		Uterine palpation	External cephalic version/ Caesarean section
Congenital abnormalities	Peri-conception folic acid supplementation, Advice on alcohol consumption	Maternal age, previous history, Uterine growth, Sonar abnormalities	Refer to specialists
Rhesus isoimmunisation	Anti –D prophylaxis for Rh negative women in previous pregnancy	Rapid Rh, Coombs test for Rh negative women	Refer Rhesus negative women with anti-D antibodies
Neonatal tetanus	Tetanus Toxoid immunisation		

How should antenatal care be organised?

What was done in ANC, how this was done, and when the visits were arranged originated from European models in the early 20th century. There was no scientific basis for the way ANC was performed or for what was included in each visit. The traditional model entailed monthly visits until 28 weeks gestation, fortnightly visits until 36 weeks gestation, and weekly visits thereafter till labour. This usually amounted to 12 visits. The content of the visits remained the same and each visit was more of a ritual than a method designed to detect and solve problems.

In recent years there has been a thorough evaluation of the way ANC was being conducted (including the number, timing and content of antenatal visits) and of who should be performing the visits. The principles on which ANC now stands consist of:

- Identification of women with special health conditions and/or those at risk of developing complications by using a simple checklist.
- Referral of those women with special health conditions or risk factors to higher levels of care. Care must be taken to ensure that all women with special health conditions or risk factors are identified.
- Timing of the visits so that the maximum benefit can be obtained without wasting human resources.
- Performing only examinations and tests that have been proven to be beneficial and conducting these at the most appropriate times (see Tables 1 and 2).
- Using rapid, easy-to-perform tests at the antenatal clinic or in a facility close to the clinic wherever possible. The results should be available the same day so treatment can be initiated at the clinic without delay
- Accessible and convenient ANC for the women. Health care providers should make all the pregnant women feel welcome at their clinic, and opening hours should be as appropriate as possible to allow the women to come to the clinic.

Providing effective ANC is dependent on identifying those pregnant women who are suitable for BANC, those that require specialist attention, and those that can receive care from both groups of health care providers. This identification occurs at the first meeting, ideally at the time of pregnancy confirmation. This is called the first visit. At this visit those pregnant women with uncomplicated pregnancies can enter the BANC program. There are set criteria that must be met for women to qualify for BANC, and these are recorded in the patient's clinic file on a checklist, and on the woman's antenatal card. At each subsequent visit, the woman must be reassessed to see if she still qualifies for BANC, or whether she should be referred to a higher level of care. Approximately 25% of pregnant women at the end of their first visit will not qualify for BANC and will need further special care. This percentage is greater in poorer areas. During pregnancy that percentage will increase by about a further 20%. This should not worry you - it means you are doing your task correctly.

After the first visit, the subsequent BANC visits have the same format, and are recorded on the woman's antenatal card and the checklist in the clinic file. (See below). The first side of the antenatal card is filled in during the first visit, and the reverse side during the follow-up visits. At the end of the first visit, it should be clear whether the woman qualifies for BANC or needs further assessment. The woman should be informed of the date and place of her follow-up visit.

The ANC process begins as soon as the pregnant woman steps into the clinic. (See charts on Principles of Good Care. These charts apply to all contact between the health care provider and the women and their babies.) There are certain specific issues for relating to ANC.

Patient flow
Each patient should be greeted and immediately assessed using the quick-check and rapid assessment and management (RAM) system (see charts). If it is the woman's first visit to the clinic regarding her pregnancy or if pregnancy has just been confirmed, providing there are no acute factors, she must undergo the "first visit". This is a very important visit and serves to classify the woman as eligible for BANC or requiring specialised care in addition to BANC. The antenatal card is issued at this visit, and the clinic record and checklist are completed. The woman is advised on her next visit.

The **follow-up visits** are at 20, 26, 32 and 38 weeks gestation. At the follow-up visits, after the questioning and examination, the antenatal card is completed and the follow-up visit checklist filled in.

Record keeping
At antenatal clinics there needs to be a record for each pregnant woman. This is filled in at each visit and results of the special investigations are recorded or attached to the record. This file is mainly for clinic administrative purposes. The new checklist (below) is an adaptation of the clinic file. Checklists have been shown to improve the quality of care of pregnant women by ensuring that procedures are not forgotten.

There should also be a record of the findings of each antenatal visit which contains the core information regarding the pregnancy. This record is the antenatal card which the woman keeps with her during the pregnancy. This is good practice as it has been proven that it is far more effective for the pregnant woman to keep her card than for it to be retained by the clinic or hospital. Gauteng Province has a standard antenatal card that is very effective as a means of capturing essential pregnancy data and facilitating communication between the different health care providers involved in the care of the woman during pregnancy and childbirth.

Audit
The proper functioning of the clinic requires that the number of pregnant women being seen per month and various other pieces of information are recorded. This information must be kept by the clinic and sent monthly to the local head office.

Further, the quality of the antenatal care can be assessed using the antenatal care audit tool. This tool, in combination with assessment of the checklists, will inform the supervisor of how well the clinic is functioning (details are given later).

Basic equipment and drugs
Each clinic that deals with pregnant women must have essential drugs and equipment required for antenatal care. An "emergency trolley" must also be available. The trolley should contain the basic equipment required for the clinic to manage an emergency while waiting to transfer the patient to the appropriate facility, for example the basic equipment needed to conduct a safe birth and to manage haemorrhage or eclampsia (see later).

Role of the supervisor/s

Each clinic will have one or more people in the role of antenatal care supervisor. There are two major categories of supervision: clinical care and administration. The specific tasks in each category are:

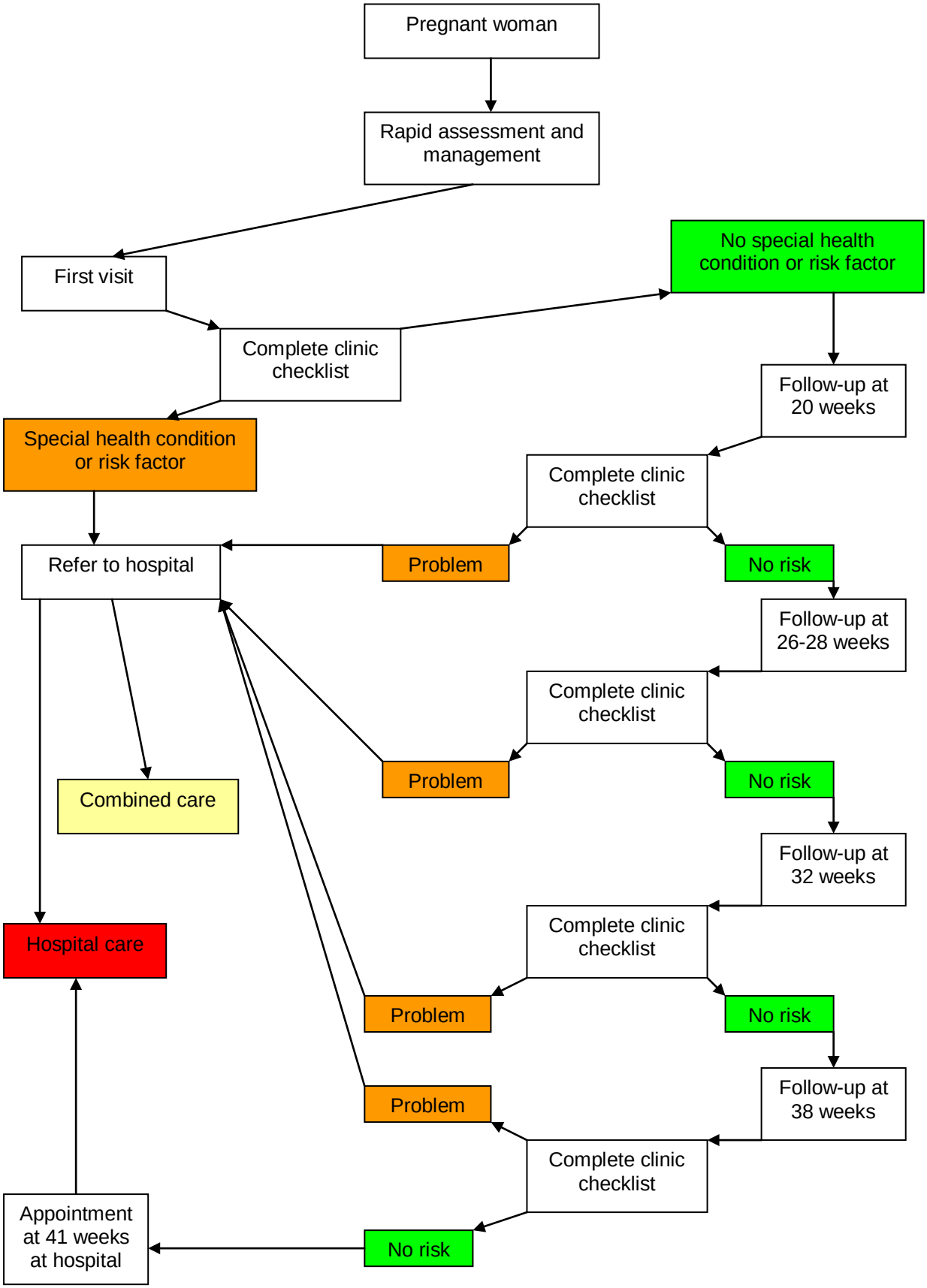
Clinical supervision

- Act as a clinic antenatal care consultant for other health care providers
- Perform quality assurance analysis
- Check cases
- Train health workers

Administration

- Collect clinic statistics
- Order drugs and equipment
- Ensure facilities and equipment are in working order

Organisation of antenatal care



Part 2 - Checklists
Clinic Checklist – Classifying (first) visit

Name of patient_____ Clinic record number | | | | | | | |

Address _____ Telephone _____

_____ Cell _____

INSTRUCTIONS: Answer all the following questions by placing a cross mark in the corresponding box

Obstetric History	**No**	**Yes**
1. Previous stillbirth or neonatal loss?		
2. History of 3 or more consecutive spontaneous abortions		
3. Birth weight of last baby < 2500g?		
4. Birth weight of last baby >4500g?		
5. Last pregnancy: hospital admission for hypertension or pre-eclampsia/eclampsia?		
6. Previous surgery on reproductive tract		
(Caesarean section, myomectomy, cone biopsy, cervical cerclage,)		
Current pregnancy		
7. Diagnosed or suspected multiple pregnancy		
8. Age < 16 years		
9. Age > 40 years		
10. Isoimmunisation Rh (-) in current or previous pregnancy		
11. Vaginal bleeding		
12. Pelvic mass		
13. Diastolic blood pressure 90 mmHg or more at booking		
14. AIDS		
General medical		
15. Diabetes mellitus on insulin or oral hypoglycaemic treatment		
16. Cardiac disease		
17. Renal disease		
18. Epilepsy		
19. Asthmatic on medication		
20. Tuberculosis		
21. Known 'substance' abuse (including heavy alcohol drinking)		
22. Any other severe medical disease or condition		

Please specify _____

A yes to any ONE of the above questions (i.e. ONE shaded box marked with a cross means that the woman is not eligible for the basic component of antenatal care

Is the woman eligible (circle) **No** **Yes**

If NO, she is referred to _____

Date_____ Name _____ Signature _____

(Staff responsible for antenatal care)

Clinic Checklist: Follow-up visits

(Back page of first visit checklist)

First visit for all women at first contact with clinics, regardless of gestational age. If first visit later than recommended, carry out activities up to that time	VISITS				
	1	**2**	**3**	**4**	**5**
DATE :					
Approximate Gest. Age.	___	**(20)** ___	**(26-28)** ___	**(32)** ___	**(38)** ___
Classifying form which indicates eligibility for BANC					
History taken					
Clinical examination					
Estimated date of delivery calculated					
Blood pressure taken					
Maternal height/weight					
Haemoglobin test					
RPR performed					
Urine tested					
Rapid Rh performed					
Counselled and voluntary testing for HIV					
Tetanus toxoid given					
Iron and folate supplementation provided					
Calcium supplementation provided					
Information for emergencies given					
Antenatal card completed and given to woman					
AZT and NVP given (if required) – Check each visit if AZT sufficient					
Clinical examination for anaemia					
Urine test for protein					
Uterus measured for excessive growth (twins), poor growth (IUGR)					
Instructions for delivery/transport to institution					
Recommendations for lactation and contraception					
Detection of breech presentation and referral					
Complete antenatal card and remind woman to bring it when in labour					
Give follow-up visit date for 41 weeks at referring institution					
Initials staff member responsible					

Additional Visits		
Date	**Reason**	**Action/Treatment**

Notes on completing checklists

1. The front page of the checklist is completed during the first (classifying) visit. The full history and examination must be conducted, and the antenatal card filled in, before the checklist is completed. If there is a tick in any one of the "yes" (shaded) boxes, the woman must be referred to a higher level of care.

2. The level of referral depends on the indication for referral, and on the protocols that have been developed in the clinic. For example, a woman aged 35 may be referred to the clinic's own doctor or to a genetic counsellor if this is indicated in the protocol developed by the clinic health workers in collaboration with the referral hospital. The doctor or counsellor would then refer the woman to the hospital if the woman opts for genetic testing.

3. At the end of the first visit the first column on the reverse side of the checklist must also be completed. This ensures that nothing is forgotten in the first visit. The date is entered, and the gestational age recorded. The date of the next visit depends on the gestational age. For example, if the woman has her first ANC visit at 22 weeks gestation, her next visit will be at 26 weeks gestation (ie. visit 3).

4. The reverse side of the checklist is completed after each follow-up visit. The date and the woman's gestational age must be completed under the appropriate column. Ensure that all clear spaces in that column are completed.

5. If the woman returns for an additional visit to the regular schedule, it should be recorded in the "Additional Visits" section of the checklist. The date, reason for the visit, and action taken should be noted here.

Part 3 - The visits

The first (classifying) visit: How, what and why

At this visit the pregnant women are divided into two groups according to pre-set criteria: those qualifying for the BANC program, and those requiring a higher level of care. Those eligible for the BANC program are those found not to require any further assessment or special care at the time of the first visit, regardless of the gestational age at which they started the program. The remaining women have specific health conditions or risk factors that may pose a risk to the pregnancy, and thus require additional care. It is possible that a woman initially referred to a higher level of care, because of a condition identified in the first visit, is subsequently considered suitable to follow the BANC program.

Note: All procedures in the BANC program must be carried out in all pregnant women, irrespective of the level of care being provided.

Ideally, the first visit should occur in the first 12 weeks of the pregnancy. This is usually possible if the first antenatal visit is performed at the time of pregnancy confirmation, as most women confirm their pregnancy within the first 12 weeks. (Pregnancy tests must be provided at the clinic). However, regardless of the gestational age, any pregnant woman attending antenatal care for the first time must undergo the procedures of the 'first visit'. This will take about 30-40 minutes.

The first page of the antenatal card is filled in, as well as the clinic checklist.

Table 3.1 outlines the *how*, *what* and *why* of the first visit, as well as the actions that should be performed.

Table 3.1. The First Visit (How, what and why)

How	What	Why – Identify special conditions or risk factors for referral
Ask	**Personal history**	**Identify special conditions or risk factors for referral**
	Name	
	Age	<16 or >34 years high risk. Refer Genetic counselling for >34 years
	Address and telephone or cell number	Contact
	Relationship with father of child	
	Tobacco and alcohol use	Tobacco – increased risk growth restriction, abruptio placenta Alcohol – Fetal alcohol syndrome
	Housing	Support system
	Sanitary conditions	Hygiene possible
	Energy source	Storage medication
	Literate	Information given to woman – written or verbal
	Income, occupation	Resources available, e.g. medical aid to supply antiretroviral therapy
	Obstetric history	**Identify special conditions or risk factors for referral**
	Number previous pregnancies	More than 5 pregnancies
	Year, gestational age at birth of baby, sex, birth weight	Low birth weight (<2500g), growth-restricted, pre-term (<34 weeks), macrosomic (>4500g)
	Method of delivery (obstetric operations)	Previous caesarean section Previous assisted delivery
	Outcome (live, miscarriage, IUD, ENND, LND, infant deaths)	Risk for current pregnancy. If any deaths – refer
	Special maternal complications	Recurrent early abortion, thrombosis, embolus, hypertension, pre-eclampsia, eclampsia, abruptio placenta, placenta praevia, breech or transverse presentation, obstructed labour, third-degree tears, third stage excessive bleeding, puerperal sepsis, post-partum depression – refer
	Special perinatal (fetal and newborn) complications	Multiple pregnancy, malformed or abnormal child, Rhesus-antibody affection, resuscitation or other treatment of newborn - refer

	Gestational age history First day of last normal menstrual period (LNMP) Cycle, regular/irregular, duration Previous contraception, type When contraception stopped When and how pregnancy was confirmed Sonar in this pregnancy Future plans for pregnancies	**Calculate EDD** Calculate gestational age Reliability of LNMP to calculate gestational age Determine "washout" period Reliability of LNMP to calculate gestational age Help with estimation of gestational age Accurate gestational age Introduction to contraceptive use after current pregnancy and what contraceptive method would be appropriate
	Medical history Specific conditions: hypertension, heart or renal problems, diabetes, epilepsy, asthma, tuberculosis (TB) HIV status if known Medication Operations other than C/S Allergies Family history: twins, diabetes, congenital abnormality	**Identify special conditions or risk factors for referral** High risk pregnancy - refer Stage, antiretroviral therapy, other medication, prevention of mother to child transmission Managed at designated clinic - refer to designated clinic Severity of medical condition, teratogenic drugs Might indicate high risk Penicillin allergy Risk for current pregnancy, might need referral
Look, feel, listen (Physical Examination)	Record weight and height Measure blood pressure Check general condition, pale, malnourished, jaundiced, short of breath, etc Thyroid mass, breasts Chest and heart auscultation Feel for uterus (if palpable measure height - cm), look for abdominal scars, especially C-section scars Consider vaginal examination using a speculum	**Identify special conditions or risk factors for referral** Body mass index (weight (kg)/height(m)^2) - refer if BMI <18.5 or>32.3 kg/m^2 (malnutrition or overweight) Upper mid-arm circumference (U-MAC) Hypertension - refer Anaemia, chronic disease - refer Thyroid lump high risk - refer Ability to breast feed Heart or lung lesions - refer Correlate with estimated gestational age calculated from LNMP - if don't correlate refer for sonar If 30 years or more with no cervical smear, or suspect STI

Tests	Test urine: protein, nitrites, leucocytes, glucose Haemoglobin Rapid Rh test RPR Counselling and testing for HIV Cervical smear	**Identify special conditions or risk factors for referral** Pre-eclampsia, urinary tract infection, diabetes Anaemia Rhesus iso-immunisation Syphilis If know status can make changes to improve lifestyle of HIV negative woman to prevent infection, or if infected, to improve general health of woman and decrease risk of transfer to infant If over 30 years and not had one before
Plan	Classify for BANC or referral Clinic Checklist	**Determine level of antenatal care** Check that nothing overlooked
Implement	Iron and folate supplements to all women Calcium supplementation to all women Tetanus toxoid: booster or first injection RPR positive – treat for syphilis Rh negative send Coombs test or refer HIV infected – send for full evaluation for ARVs In malaria endemic areas: sulphadoxine/pyrimethamine Refer high-risk cases – see checklist	**Preventing complications** Prevent anaemia Prevent hypertension and pre-eclampsia Prevent neonatal tetanus Prevent congenital syphilis and stillbirths Prevent rhesus iso-immunisation or refer for treatment Improve woman's health and pregnancy outcome for infant Prevent malaria Improve pregnancy outcome
Give advice	Safe sex Stop tobacco, alcohol Infant feeding Education about haemorrhage & warning signs Birth plan	**Preventing complications and improve general health** Prevent STIs Prevent fetal alcohol syndrome, growth restriction, abruptio plaentae Discuss options if HIV infected, promote breast feeding if HIV negative Educate woman Where (what institution) she will give birth, arrangements for transport when goes she into labour
Questions and answers	Give time for free communication	May raise issues that are worrying woman or things left out
Schedule next visit	Write on antenatal card and clinic checklist	
Complete records	Complete clinic record Complete antenatal care and give it to the woman	Checklist helps to prevent things being overlooked Patient carried card is far more effective than clinic held notes

Follow-up visits: How, what, when, why

As mentioned, the traditional model of antenatal care was more of a ritual than a scientific method designed to detect and solve problems, and in recent years there has been a thorough evaluation of antenatal care. The follow-up visits have been found to be most effective at 20, 26, 32 and 38 weeks gestation. This coincides with performing examinations and tests at times that are of most benefit to the pregnant woman and that give the greatest chance of detecting problems that can be treated. A large study was by the WHO in developing countries in which this schedule was compared to the traditional method of ANC visits. The study found that there was no difference in maternal and perinatal outcomes under the new schedule, and that the cost of ANC was reduced. However, some women felt somewhat insecure because of the long time between each visit.

In South Africa, antenatal care has tended to start late, after 20 weeks gestation. This must be dealt with in order to reach the goal of having healthy women and babies. Antenatal care should start in the first trimester, that is, in the first three months of pregnancy. To accommodate this goal and the wishes of pregnant women, the ideal timings of ANC visits in South Africa would be at pregnancy confirmation (usually within the first 12 weeks), and thereafter at 20, 26, 32 and 38 weeks gestation. Care must be taken to ensure that all actions that need to be performed are performed at each of the visits, and that any problems identified are acted upon. It should be stressed to the woman that she is able to attend the clinic at any time, and must do so if anything is worrying her.

Each follow-up visit should last about 20 minutes. Table 3.2 outlines the *how*, *what*, *when* and *why* of the follow-up visits, as well as the actions that should be performed. At the end of each visit the woman's clinic checklist should be checked to see that all the appropriate tasks have been performed.

Table 3.2. Follow-up visits (How, what, when and why)

How	What	When				Why
Rapid assessment and management (RAM)						Act immediately if there is an emergency
Ask;		**20**	**26**	**32**	**38**	
	How are you?	✓	✓	✓	✓	
	Is the baby moving?	✓	✓	✓	✓	
	Have you had any bleeding?	✓	✓	✓	✓	
	Have you any concerns/symptoms of……?	✓	✓	✓	✓	
	Vaginitis					Risk of ascending infections
	Urinary tract infection					Risk of ascending infections
	Cough					Risk of tuberculosis, other chest infections
	Malnutrition					Chronic disease, poverty
	HIV/AIDS					Ensure proper management
Check antenatal card						
	Calculate current gestational age	✓	✓	✓	✓	Need this to fill-in antenatal card and check fetal growth
	Syphilis serology	✓	✓	✓	✓	Check that result has been entered and the woman treated, if necessary
	Haemoglobin	✓	✓	✓	✓	Check for the Hb result and treatment of any anaemia
	Counselled and tested (HIV)	✓	✓	✓	✓	Check that this has been performed
	Booster dose Tetanus toxoid			✓		Only if immunising for the first time
	Previous visits concerns	✓	✓	✓	✓	Have these been solved?
Look, feel, listen						
	Anaemia	✓	✓	✓	✓	Screen for anaemia, Hb again at 32 weeks
	Blood pressure	✓	✓	✓	✓	Screen for hypertension
	Urine; protein/glucose	✓	✓	✓	✓	Screen for pre-eclampsia and diabetes
	Uterine growth	✓	✓	✓	✓	Screen for IUGR
	Fetal position (from 34 weeks)				✓	Screen for abnormal lie, e.g. breech

Signs		✓	✓	✓	✓	Note all the abnormalities
Classify		✓	✓	✓	✓	Classify the abnormalities into diseases
Treat and advise		✓	✓	✓	✓	Treat and advise according to the diseases identified.
Fill in antenatal card and revise birth plan if necessary		✓	✓	✓	✓	
Implement the following interventions	Iron and folate supplements to all women	✓	✓	✓	✓	To prevent anaemia
	Calcium supplementation to all women	✓	✓	✓	✓	To prevent hypertension
	Tetanus toxoid; booster or first injection					To prevent neonatal tetanus
	RPR positive – treat for syphilis	✓	✓	✓	✓	To prevent congenital syphilis and stillbirths
	Rh negative send Coombs test or refer					To identify Rh iso-immunisation
	HIV infected – send for full evaluation for ARVs (See HIV protocols)					To support, treat and prevent transmission
	In malaria endemic areas: sulphadoxine/pyrimethamine	✓	✓	✓	✓	
General advice	Safe sex	✓	✓	✓	✓	Prevent STIs
	Stop tobacco, alcohol	✓	✓	✓	✓	Prevent IUGR and congenital abnormalities
	Infant feeding			✓	✓	Plan for feeding after the birth of child
	Education about haemorrhage & warning signs	✓	✓	✓	✓	Early identification of complications
	Birth plan	✓	✓	✓	✓	Make sure the appropriate institution for delivery is identified and that there is a transport plan to get there
	Contraceptive advice			✓	✓	Plan for future pregnancies and allow appropriate spacing of children
Questions and answers		✓	✓	✓	✓	Enable woman to voice concerns
Date next follow-up visit		✓	✓	✓	✓	
Maintain complete records		✓	✓	✓	✓	Ensure antenatal care and clinic checklist completed

Part 4 - Special Skills

Monitoring blood pressure and urine

Some useful definitions

Eclampsia: fits (convulsions) in a woman with pre-eclampsia

Hypertension: diastolic blood pressure of 90 mmHg or more, and systolic blood pressure of 140 mmHg or more.

Pre-eclampsia: a disease that only occurs during pregnancy and affects every organ in the body, including the baby. Signs and symptoms include swelling, headaches and abdominal pain. The cause of the disease is unknown, but it is the most common direct cause of maternal mortality in South Africa. Deaths are usually a result of heart or lung failure, or a brain bleed. Kidney failure and bleeding due to a loss of clotting factors may also occur. In addition, pre-eclampsia is a common cause of perinatal deaths and IUGR. Pre-eclampsia may be prevented, or at least delayed, by giving calcium supplementation to the woman. Complications can be prevented by early detection and appropriate management of the disease. In emergencies, it is very important to lower the blood pressure and prevent convulsions.

Proteinuria: 1+ or more of protein as measured on a reagent strip.

Why should the blood pressure and urine be monitored?

Approximately 1 in 4 maternal deaths in South Africa are due to complications of high blood pressure (hypertension) in pregnancy. High blood pressure, especially when occuring together with protein in the urine (proteinuria), is a key indicator of pre-eclampsia (see above). Pre-eclampsia is more likely to occur in women:

- in whom the pregnancy is the first by the current partner
- who have had pre-eclampsia or eclampsia before
- with hypertension
- less than18 years old or more than 35 years old
- with a multiple pregnancy

Usually the earliest sign of pre-eclampsia is hypertension. However, sometimes the earliest signs might be proteinuria or IUGR. A woman might also have some of the following symptoms indicating severe disease:

- Severe headache
- Blurred vision
- Epigastric pain

Detecting the disease early and referring the women to the appropriate level of care can prevent complications in the woman and her baby. Measuring the blood pressure regularly and testing the urine for protein are the best ways of detecting pre-eclampsia early. Therefore it is important to do these at each antenatal visit.

Unfortunately eclampsia can occur without any warning, even in women regularly attending antenatal care. Therefore it is important for every clinic to be able to give women with eclampsia and pre-eclampsia the emergency treatment required before referring the women. In emergencies it is very important to lower the blood pressure and prevent convulsions.

How should the blood pressure and urine be monitored?

The woman's blood pressure should be measured, and her urine tested, at every visit.

The blood pressure can be taken with the woman sitting or lying on her side, but it is important that she should not lie on her back. The cuff should cover two-thirds of the arm. It is important to check this in obese women, as an obese cuff might be needed to ensure an accurate blood pressure measurement. The systolic blood pressure is when the first sound is heard, and the diastolic blood pressure is when the sound disappears. (See skills CD for demonstration or PEP Maternal Manual – Skills Workshop 3).

The urine is tested for protein using urine dipsticks. It is important to wait 30 seconds before reading the strip and to ensure that the dipsticks have not expired. (See skills CD or PEP Maternal Manual – Skills Workshop 3).

What should be done with women with hypertension and or proteinuria?

A woman has **severe pre-eclampsia** if:

- diastolic blood pressure 110 mmHg or more with 3+ proteinuria
- diastolic blood pressure 90 mmHg or more on 2 readings with 2+ proteinuria and symptoms (severe headache, blurred vision or epigastric pain)

She should first be given magnesium sulphate, and then antihypertensive treatment if the diastolic blood pressure does not fall below 110 mmHg 15 minutes after receiving the magnesium sulphate. She should then be referred urgently to the referring hospital.

A woman has **pre-eclampsia** if:

- diastolic blood pressure between 90-110 mmHg on 2 readings with at least 1+ proteinuria but no symptoms

She should be referred to hospital the same day.

A woman has **hypertension** if:

- diastolic blood pressure above 90 mmHg on 2 readings with no proteinuria or symptoms

If the diastolic blood pressure is above 100 mmHg on 2 readings she should be advised to rest and to reduce her workload, be informed about pre-eclampsia danger signs, and then be referred to hospital.

If the diastolic blood pressure is between 90 and 100 mmHg on 2 readings she should be advised to rest and to reduce her workload, be informed about pre-eclampsia danger signs, and then be seen at the clinic again in 1 week. If the blood pressure remains high she should be reviewed by a doctor or advanced midwife. Anti-hypertensive treatment may need to be started.

Can pre-eclampsia be prevented?

Pre-eclampsia can be prevented or its onset delayed by giving calcium tablets to pregnant women. The woman must take 1.5g of calcium per day. This is a recent finding and very few institutions have implemented routine calcium supplementation. However, in the next few years calcium supplementation should become part of the standard supplementation given to pregnant women, along with iron and folic acid.

Screening for anaemia and malnutrition

Some useful definitions

Anaemia: low level of haemoglobin (substance in the blood that carries oxygen). A woman is said to be anaemic when her haemoglobin level is below 11g/dl, but treatment usually only occurs when haemoglobin is below 10g/dl.

Body Mass Index (BMI): a measure of nutritional status. BMI is calculated by dividing the woman's weight (kg) by her height (m2)

Upper Mid-Arm Circumference (U-MAC): This is also a measure of the BMI, but is much easier to do. The circumference of the upper part of the arm is measured in the middle of the arm and recorded in centimetres.

Why should there be screening for anaemia and malnutrition?

Malnourished women have an increased risk of pregnancy complications, including death, than women who are not malnourished. For example, if a woman bleeds after giving birth, she is more likely to die from this haemorrhage if her haemoglobin level is 8g/dl (anaemia), than if it is 12g/dl (normal). This is because in anaemia there is much less oxygen available to her body. (Anaemia is one of the early signs of malnutrition.)

Anaemia is a very common condition, with one in five pregnant women having a haemoglobin value less than 10g/dl in some districts of South Africa. In many more pregnant women the iron stores are also low. Iron is essential for the body to be able to produce haemoglobin.

Anaemia may also be a sign of another chronic disease such as like HIV infection, tuberculosis or malaria.

Malnutrition is often a sign of poverty. If malnutrition is identified then referring the woman to a social worker can be of help the woman, and she can also receive food parcels. Malnourished women deliver more low birth weight babies than women who are well nourished. It has been shown that giving a malnourished woman balanced protein/caloric supplementation can improve both the general health of the mother and birth weight of the baby.

Babies that are malnourished in the uterus, and in the first year of life, are more likely to develop hypertension, heart attacks, strokes and diabetes mellitus as adults.

Obese women are also malnourished.

How should screening for malnutrition be performed?

In all women the U-MAC should also be measured at the first visit. A U-MAC is a simple measure of the BMI and hence the nutritional status of the woman. A U-MAC of 23 cm or less correlates very well with a low BMI and malnutrition. The U-MAC is also useful as it does not change during pregnancy. So the value obtained can be used irrespective of how far pregnant the woman is. The BMI unfortunately is

affected by pregnancy as she gains weight during pregnancy, so malnourished women might be missed when calculating the BMI in the second half of pregnancy.

At the first visit the woman should be also be weighed and her height measured so that the body mass index (BMI) can be calculated (see definition above). A BMI of less than 18.5kg/m2 indicates malnutrition, and a BMI of more than 32.3kg/m2 indicates obesity, which is also a form of malnutrition.

If the BMI cannot be calculated, a pregnant woman who weighs less than 45kg or more than 85 kg is at greater risk of complications and should be referred for further evaluation.

How should screening for anaemia be performed?

Women who are severely anaemic are pale (in their conjunctiva and on their hands) and may complain that they tire easily or get short of breath doing routine tasks, like the housework. All women should be questioned at each visit about these symptoms, and should have her hands and conjunctiva of her eyes examined.

At the first ANC visit and at 32 weeks gestation the haemoglobin level should be tested. Testing can be done using copper sulphate or a haemoglobinometer. If using the copper sulphate method, a drop of blood is dropped into a special solution of copper sulphate. If the drop floats the haemoglobin is less than 10g/dl, if it sinks it is more than 10g/dl. (See CD on obstetric skills.) Using copper sulphate is simpler and more sustainable than a haemoglobinometer, because there are no batteries, glass slides or sticks to haemolyse the blood that can be lost or may need to be replaced. The copper sulphate solution is also very cheap.

What action should be taken if there is malnutrition?

A malnourished woman must be examined to determine the cause of the malnutrition. She needs to be assessed to see if there is an underlying disease (like HIV infection or tuberculosis), and her social circumstances need to be evaluated. If she is starving because of a lack of money or support, she should be referred to the social workers who will help her obtain financial support and ensure that she receives food parcels.

She will need to be seen by a doctor or an advanced midwife.

What action should be taken if there is anaemia?

If there is **severe anaemia** (haemoglobin <8g/dl, symptoms or pallor) she should be referred to hospital. She should be started on iron *(ferrous sulphate 200mg (1 tablet) three times daily)* and folic acid *(5mg (1 tablet) daily)* supplementation immediately. She should be counselled on the importance of taking her tablets. Nutritional advice should be given.

If there is **mild anaemia** (haemoglobin >8g/dl but <10g/dl) she should be given iron (*ferrous sulphate 200mg (1 tablet) three times daily)* and folic acid *(5mg (1 tablet) daily)* supplementation. She should be counselled on the importance of taking her tablets. Nutritional advice should be given.

If the woman is less than 34 weeks pregnant, she should be seen again in 4 weeks and the haemoglobin checked again. If it is still low she should be referred to hospital. If she is 34 weeks pregnant or more she needs to be referred to hospital for follow-up and delivery.

Can anaemia be prevented?

Yes, anaemia can be prevented. All pregnant women should receive ferrous sulphate 200mg (1 tablet) daily, and folic acid 5 mg (1 tablet) daily throughout their pregnancy. If women are found to be anaemic, more iron and folic acid will be required.

Monitoring fetal growth and post-maturity

Some useful definitions

Intra-uterine growth restriction (IUGR): when a fetus does not weigh as much as he/she should for his/her age. In other words, the fetus is smaller than he/she should have been. IUGR is usually due to the fetus not receiving enough nutrients (including oxygen) during the antenatal period. It is a common condition in South Africa, and a major contributor to perinatal deaths. IUGR is diagnosed when the weight of the fetus is below the 10^{th} percentile for his/her age, as determined by growth charts. IUGR can be detected during the antenatal care, and appropriate interventions taken to prevent the death of the baby.

Low birth weight (LBW): A baby born weighing less than 2500g.

Post-maturity: when the fetus is mature but begins starving in the uterus, due to a lack of nutrients. It occurs most commonly in post-term fetuses.

Post-term: when the pregnancy has exceeded 41 weeks.

Why should fetal growth be monitored?

Poor fetal growth is a sign that the fetus might be suffering inside the uterus. Poor fetal growth or intra-uterine growth restriction (IUGR) is also a major cause of stillbirths and of neonatal morbidity. By identifying those IUGR, appropriate interventions can occur to help the fetus and improve his/her health, which might save his/her life. If better care is able to be provided to the baby in the nursery, pregnancy may be induced. Research has also shown that babies that are malnourished in the uterus and in the first year of life are more likely to develop diseases such as hypertension, heart attacks, strokes and diabetes mellitus later in life. Identifying and helping these malnourished babies can improve their future health substantially. Detecting IUGR and managing these pregnancies appropriately is one way in which antenatal care can make a difference to the outcome of the pregnancy.

How should fetal growth be monitored?

The **first step** is to establish the expected date of delivery (EDD) of the baby. It is crucial to accurately determine the EDD, so that the gestational age of the fetus can be calculated whenever the pregnant woman seeks health care. It is very important to spend some time in establishing the EDD accurately, because it is central to diagnosing important conditions such as IUGR and post-maturity.

The EDD is calculated using the woman's last normal menstrual period (LNMP), if reliable. (See definition, *Introduction to Basic Antenatal Care*). The EDD is best established as early as possible, and is an important reason for initiating ANC at pregnancy confirmation. If the LNMP dates are uncertain, the woman can be sent for an ultrasound (sonar) examination. Ultrasound is only accurate in determining gestational age if conducted early in the pregnancy (if the SFH <24 cm), which is another very good reason for conducting the first ANC visit when the pregnancy is confirmed. Many women have sonar performed privately, so it is essential to ask them if they have had a sonar examination when trying to establish the EDD.

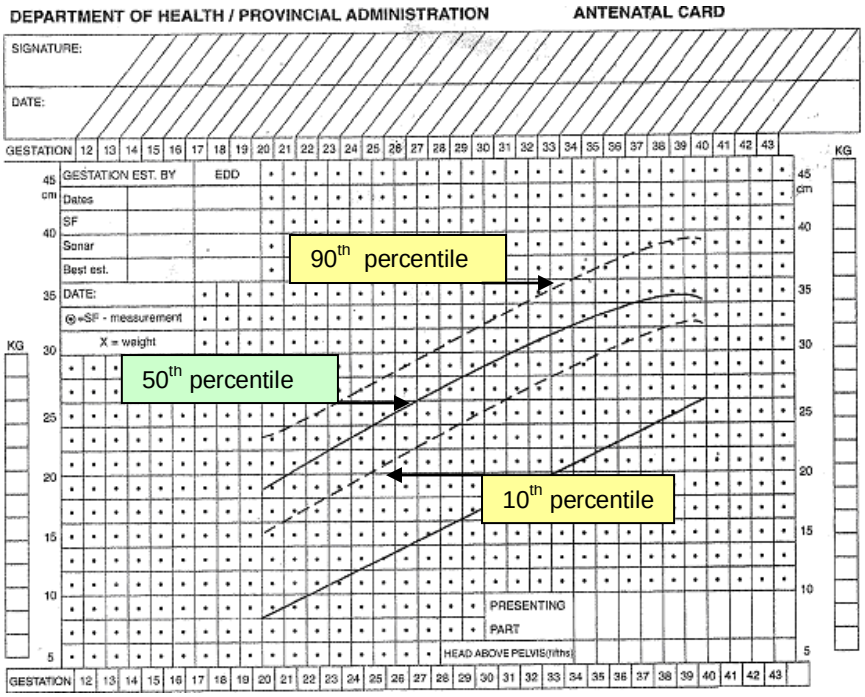
The **second step** is to determine the gestational age of the baby at the visit. This is best calculated by using a gestational age calculator which should be present in all clinics.

The calculator is used by putting the 40-week (term) marker of the inner wheel against the date on the outer wheel that corresponds to the EDD. The gestational age (weeks) is the number on the inner wheel that corresponds to the date of the visit on the outer wheel. Once the gestational age is known, the fetus can be measured and the actual size compared with what it should be for that gestational age. The gestational age should be marked on the growth chart. (The gestation (in weeks) is found running horizontally above and below the symphysis-fundus growth chart.)

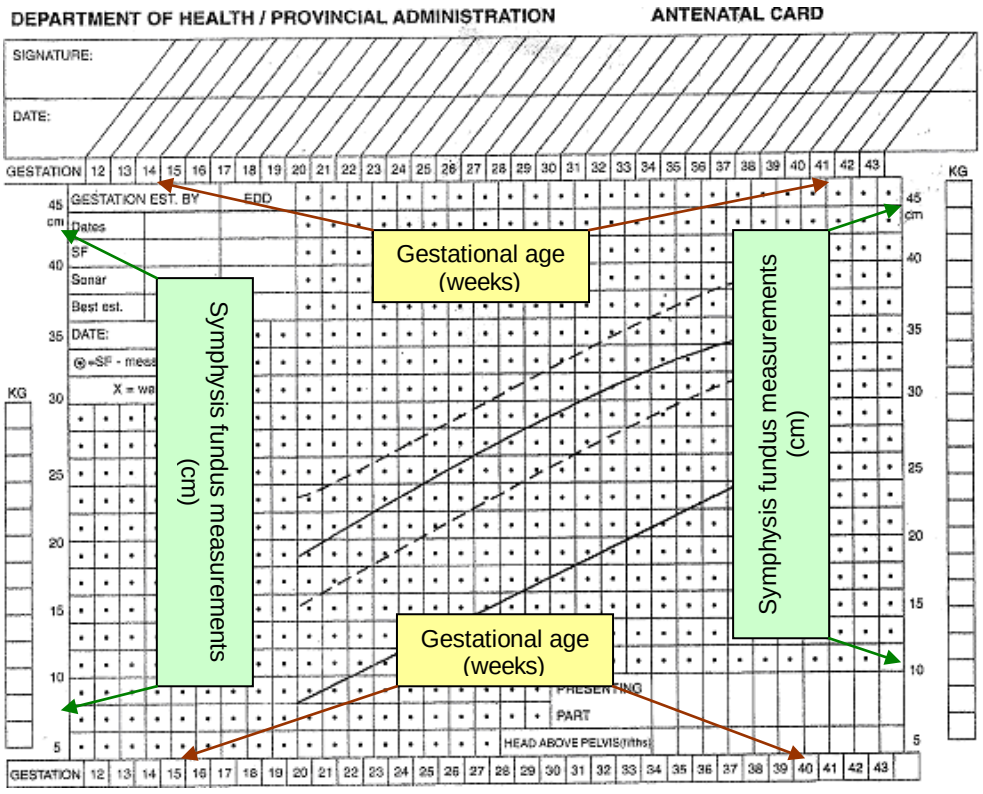
The **third step** is to measure the fetus. Measuring the fetus is done indirectly by measuring the size of the uterus. This is done by measuring the distance from the top point of the symphysis pubis to the top point of the fundus of uterus using a tape measure. This is known as the symphysis-fundus (SF) measurement. It is measured in centimetres.

The **fourth step** is to plot the SF measurement on a symphisis-fundus growth chart. The symphysis-fundus growth chart is a chart that shows how the uterus grows during the weeks of pregnancy.

The growth of an average uterus is shown by a solid curved line, known as the 50th percentile line. The average fetus' growth will follow the 50th percentile line. The 90th percentile and the 10th percentile lines are also shown on the growth chart. The 90th percentile means that 90% of fetuses will fall below that line. If the measurement falls above the 90th percentile line then the fetus might be growing too much, or there might be a multiple pregnancy. The 10th percentile means that 10% of fetuses fall above this line. If the measurement falls below the 10th percentile then the fetus may be growth restricted. The size of the uterus should be marked on the line corresponding to its gestational age in weeks. See chart below.

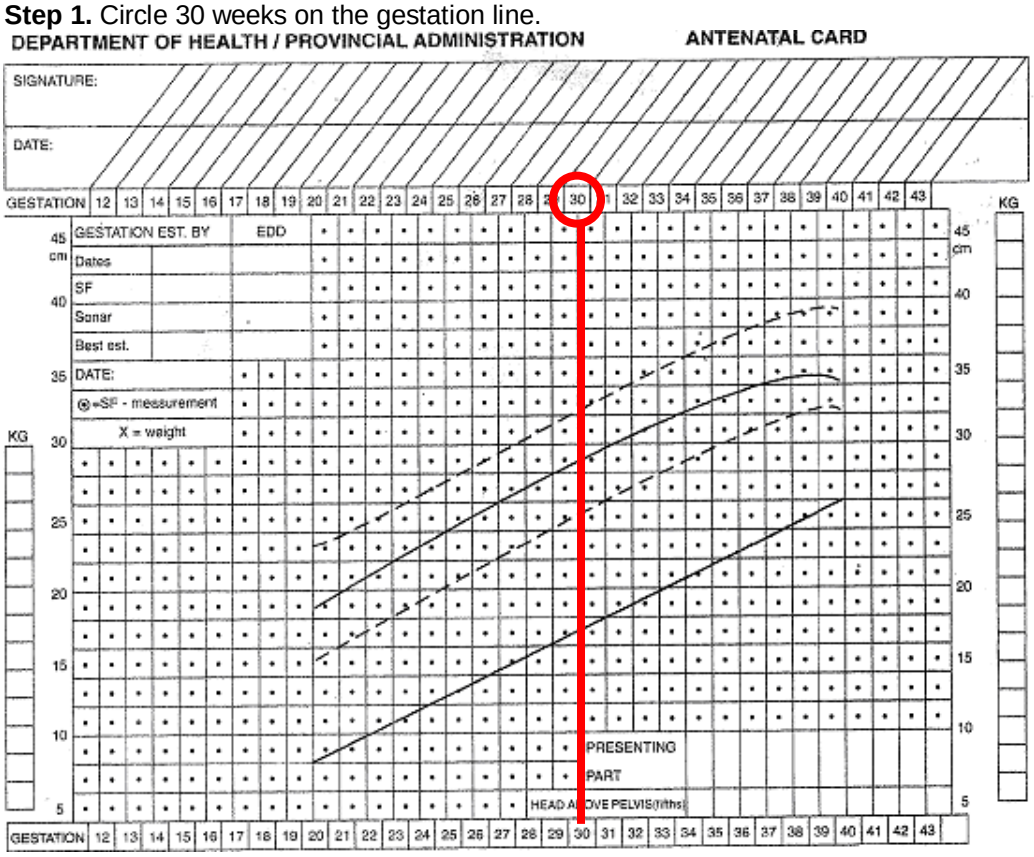


To plot the SF measurement, mark the gestational age in weeks (that has been calculated for the visit) on the horizontal axis. Follow the corresponding vertical line down until the measurement (cm) is reached on the vertical axis, and make a dot and circle. Note: The gestation in weeks always runs horizontally and the SF measurements in centimetres always run vertically (see diagram).

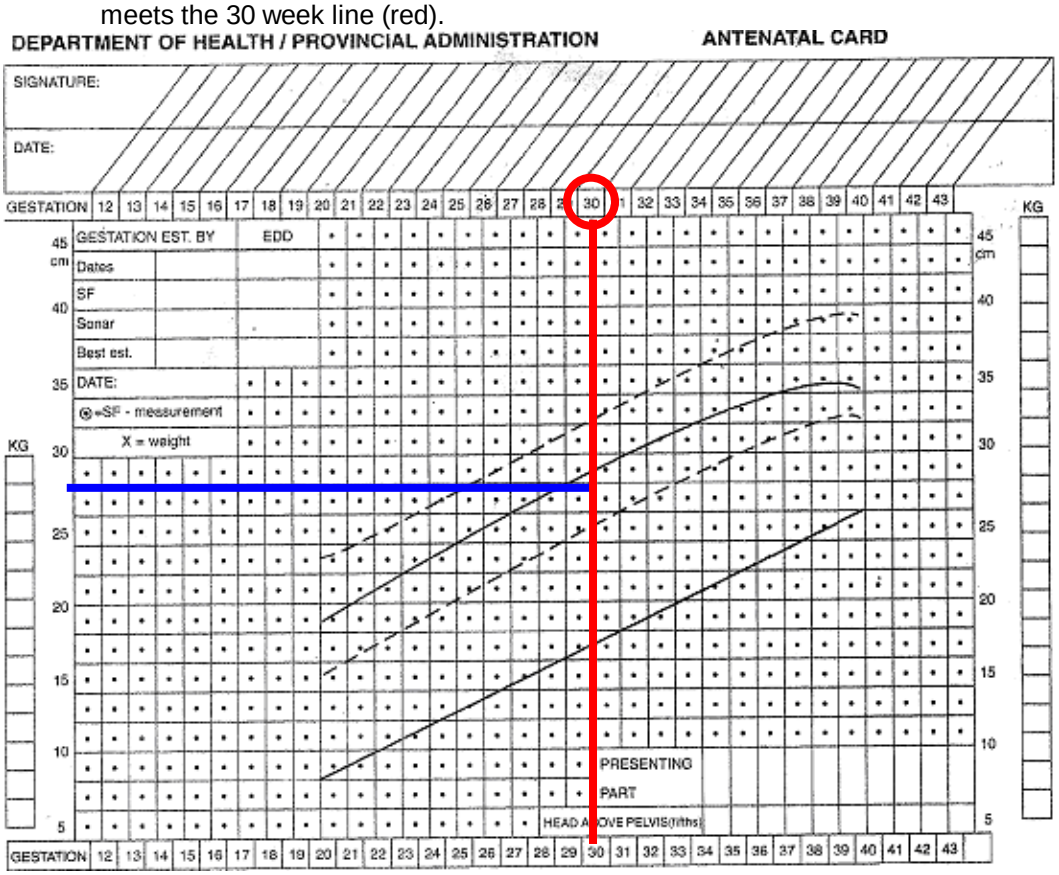


For example: if the EDD is the 30th September, and the date of the visit is the 22nd July, then the gestational age at the time of the visit is 30 weeks. The SF measurement was found to be 28 cm. Circle 30 weeks on the gestation line (**step 1**). Go to the SF measurement side and at 28 cm read across (blue line) until you reach the vertical line of the gestational age (red) at 30 weeks (**step 2**). At that point make a small circle (**step 3**).

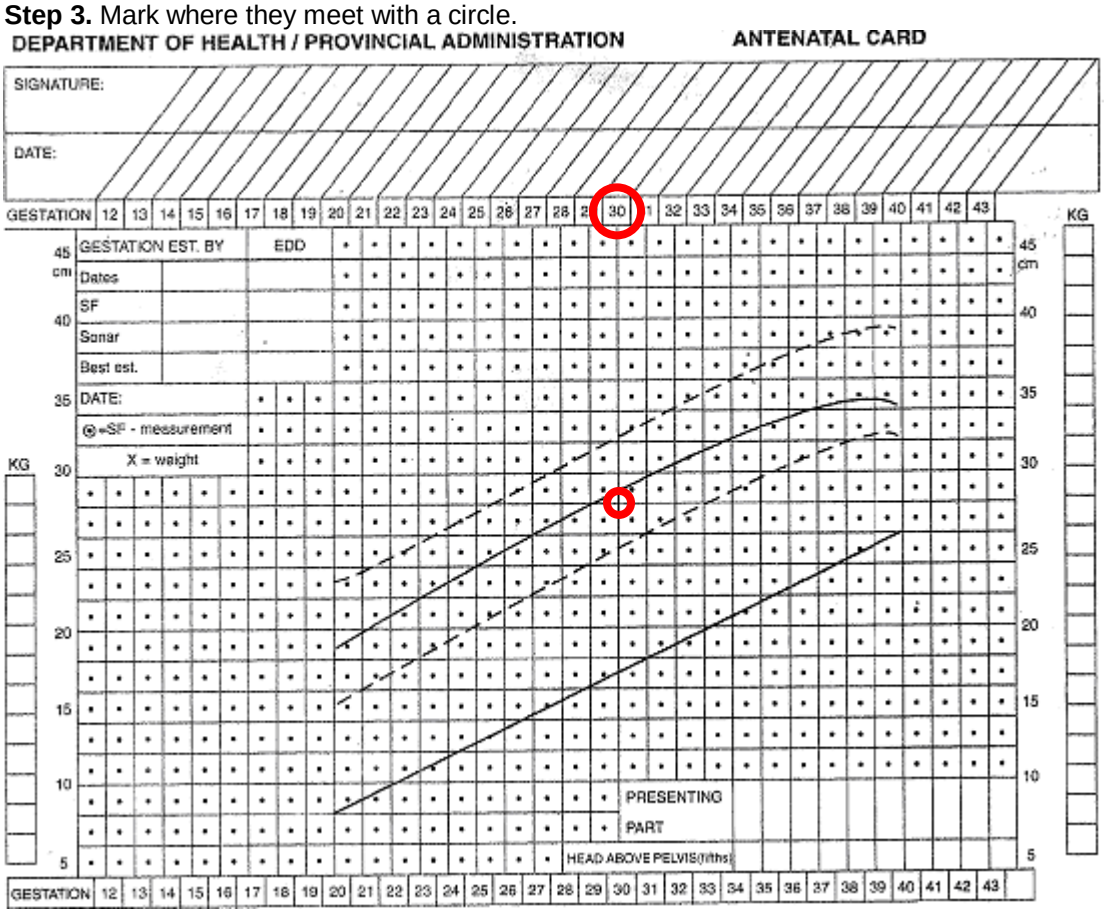
Step 1. Circle 30 weeks on the gestation line.



Step 2. Go the 28 cm on the SF measurement line and follow it across (blue line) until it meets the 30 week line (red).



Step 3. Mark where they meet with a circle.



The **fifth step** is to compare the size of the fetus with the size of normal fetuses of the same gestational age. This is done by looking at where the mark is in relation to the 10th, 50th and 90th percentile lines.

- If it lies between the 10th percentile and the 90th percentile growth is usually normal
- If it lies below the 10th percentile there might be poor fetal growth
- If it lies above the 90th percentile there might be excessive growth or it may be a multiple pregnancy

(In the example shown above, the uterine size is appropriate for the gestational age)

The **sixth step** is to examine the pattern of growth - how the uterus has grown over time in the pregnancy. In other words, how the fetus has grown since the last visit and the previous visits.

If the uterus is the same size as it was at the last visit, then growth might have stopped. If the last measurement was taken more than 4 weeks before, then this might indicate poor fetal growth, even if the measurement is not below the 10th percentile line. If the measurement is below the last measurement, this may also indicate poor fetal growth.

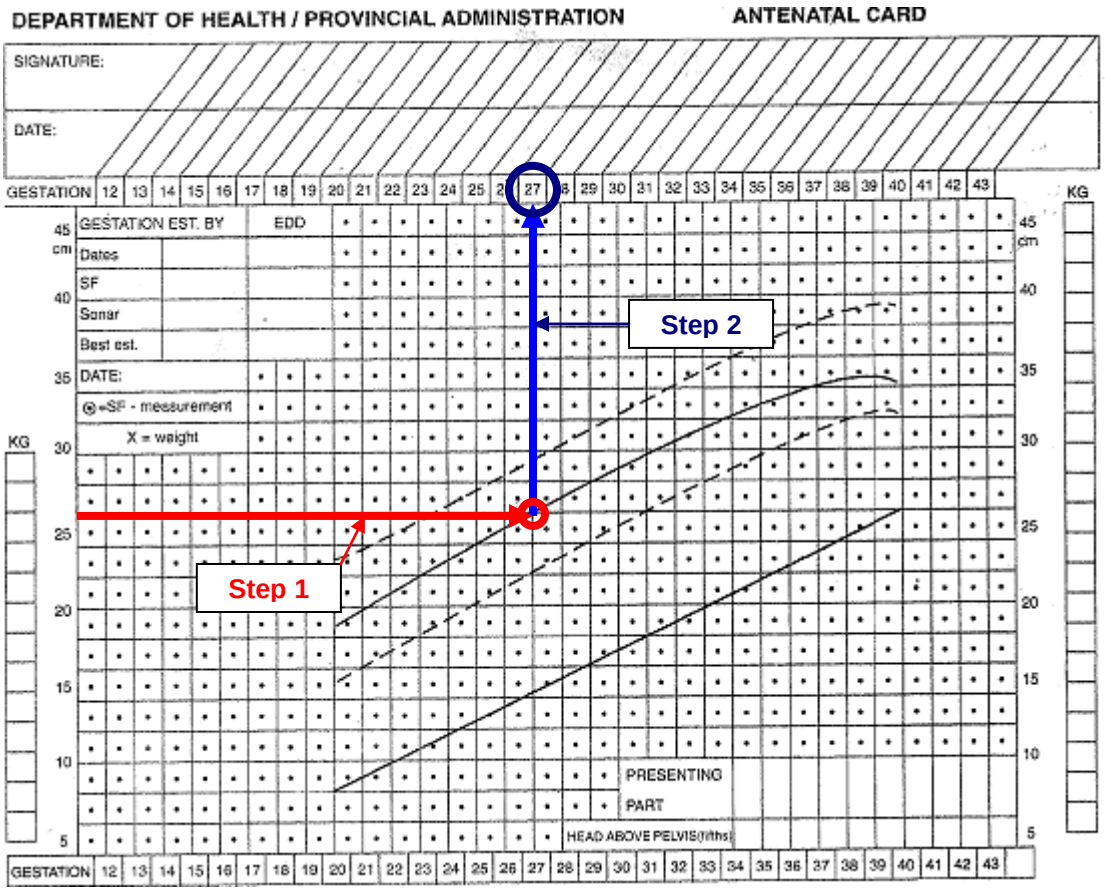
What must be done when the EDD cannot be established?

In the circumstances where the EDD cannot be accurately established and it is too late for sonar (SF measurement more than 24 cm), a different method is used to start the symphysis-fundus growth chart and establish an EDD.

Measure the SF height and mark that measurement on the vertical SF scale. Now draw a line horizontally at this point, and mark where it crosses the 50th percentile line by making a dot and circling it. Now move vertically upwards from here until the gestational age scale is met. Circle the corresponding gestational age. That gestational age is now the woman's presumed gestational age.

To estimate the EDD, place the calculated gestational age (inner wheel) against the day's date on the gestational age calculator, and then read off the date (outer wheel) that corresponds to the 40-week mark of the inner wheel. This date is the EDD. All the follow-up measurements are performed using this estimated EDD to calculate the gestational age at the time of the visit.

For example: If the woman's gestational age cannot be calculated and the SF measurement is 26 cm, mark 26 cm on the vertical scale and trace across until the 50th percentile line is met. Make a circle (**step 1**). From this point go up the vertical line to the gestation scale and make a circle where it meets the line (**step 2**). The estimated gestational age is therefore 27 weeks. If the date of the visit is 1st July, the EDD (from the gestational calculator) is 1st October.



What is a SF measurement pattern suggesting poor fetal growth?

- 2 successive SF measurements below the 10th percentile
- 3 separate SF measurements below the 10th percentile
- 3 successive SF measurements remaining the same (without necessarily crossing below the 10th percentile).
- 2 successive SF measurements 6 weeks or more apart remaining the same (without necessarily crossing below the 10th percentile)
- A SF measurement that is less than that recorded 2 visits previously (without necessarily crossing below the 10th percentile)

What is a SF measurement pattern suggesting excessive growth?

- Any SF measurement above the 90th percentile before 28 weeks gestation
- Successive SF measurements above the 90th percentile

SF measurements above the 90th percentile can be caused by:

- Multiple pregnancy
- Macrosomic (large) fetus
- Diabetes mellitus
- Polyhydramnios (excessive fluid around the fetus). This suggests multiple pregnancy or congenital abnormalities.
- Obese woman. Unfortunately in obese women the thickness of the abdominal wall makes the SF measurements unreliable. However women with a BMI of >32.3 kg/cm^2 should be referred to a higher level of care in any case.

What is the further action?

If the baby is smaller or larger than it should be, further action must be taken to find out if the baby is suffering or not. The mother and baby can then be helped.

Women with SF measurements suggesting **excessive growth** must be reviewed to determine whether there is a multiple pregnancy, congenital abnormalities, diabetes mellitus or a macrosomic fetus (fetus > 90th percentile). If any of these are found, the birth plan will need to be revised. For example, a woman with a macrosomic baby will need to deliver in a unit that can perform caesarean sections.

If there are poor SF measurements suggesting **growth restriction**, the measurements should first be examined according to the above criteria for IUGR.

In situations where the SF measurement criteria above have not been met but the SF measurements tend to be poor:

- Counsel on nutrition. Advise the woman to eat a large amount and variety of healthy foods (such as meat, fish, oils, nuts, seeds, cereals, beans, vegetables, cheese and milk) to help her feel well and strong. Review her social conditions as she may need referral to a social worker or nutritional support.
- Advise the woman to rest and to reduce her workload
- If necessary, advise the woman to stop drinking alcohol or smoking

- Recommend and demonstrate use of a fetal movement chart (See section on counting fetal movements)
- Arrange a follow-up visit in 1 week's time

In situations where the SF measurement criteria above are met:

- First check to see it the fetus is alive
- Question the mother about fetal movements. If the movements have been poor, refer her the same day to the referral institution. If movements have been good, refer the woman within a week.
- Counsel on nutrition. Advise the woman to eat a large amount and variety of healthy foods (such as meat, fish, oils, nuts, seeds, cereals, beans, vegetables, cheese and milk) to help her feel well and strong. Review her social conditions as she may need referral to a social worker or nutritional support.
- Advise the woman to rest and to reduce her workload
- If necessary, advise the woman to stop drinking alcohol or smoking
- Recommend and demonstrate use of a fetal movement chart (See section on counting fetal movements)

How should post-maturity be detected?

Post-maturity is easy to detect if the EDD is known, because all women who are 1 week past their EDD are at risk. These women should routinely be referred for induction of labour.

If the EDD is not known, or has been estimated by SF measurements, then the best way to diagnose post-maturity is by estimating the amount of amniotic fluid using sonar. If the amount of amniotic fluid is low (amniotic fluid index (AFI) is less than 5 cm), induction of labour is recommended.

How should the pregnancies at risk for post-maturity be managed?

All women who are definitely 1 week beyond a clearly established EDD should be advised to have an induction of labour. It has been shown that induction of labour does not increase the risk of caesarean section or assisted delivery, and it is better for the baby's health for it to be out of the uterus.

If the EDD is uncertain, women should be referred to a hospital or clinic with sonar facilities to have an amniotic fluid measurement taken. If the AFI is low, induction of labour should be advised. If the AFI is normal, the woman should be instructed in the use of a fetal movement chart and should have weekly amniotic fluid index measurements taken.

HIV infection in pregnancy

Why should there be counselling and voluntary testing (VCT) for HIV infection?

AIDS is the most common cause of maternal death in South Africa. HIV infection has a long incubation period. Most of the women who will die from AIDS in the next 10 years are already infected with HIV. In order for these women to be able to care for their babies, their deaths must be prevented. This must be done by improving their general health, treating any infections early, and providing antiretroviral treatment to those women who are eligible.

Women who have an HIV infection in pregnancy are more likely to have:

- TB, pneumonia (including PCP)
- UTI, vaginitis
- Post-partum sepsis
- Anaemia, malnutrition
- Stillborn babies
- Pre-term labour
- IUGR babies

By managing the woman appropriately during pregnancy, many of these conditions can be prevented or treated effectively.

Complications of HIV infections in infants are the most common cause of death in children under 5 years of age. Mother to child transmission can be prevented by giving antiretroviral drugs to the woman shortly before labour or early in labour. Therefore, the HIV status of the woman needs to be known to enable the woman to be treated appropriately and to prevent transmission of infection in HIV+ women. Counselling and testing is the only way to do this.

What should be done if the woman is HIV infected?

Management of HIV infection in pregnancy is a constantly evolving and expanding area. The national protocols are being updated frequently. The full guideline (PMTCT revised policy February 2008) is given in the on the CD accompanying the BANC programme. An abbreviated version is given below. The flow charts of the WHO IMPC programme have been adapted for South African circumstances and current guidelines. However, clinic supervisors must remain alert for any changes in guidelines, and should inform the clinic staff of these changes.

DUAL THERAPY PMTCT PROTOCOL

FIRST VISIT

Group information session for all women in antenatal clinic about HIV
Individual counselling by health care provider (pretest Counselling)
Offer HIV Test and if agree obtain written Consent
If Client declines the test, offer them in subsequent visits throughout pregnancy
If test reactive, confirm with another rapid test and do post test counselling
If test non-reactive, do post counselling and re-test round 6 weeks around 34 weeks or 6 weeks later whatever is the earliest.
If test equivocal do an ELISA test.

MANAGEMENT OF MOTHERS WITH REACTIVE HIV TEST.

Take history looking for HIV related conditions (see WHO clinical staging)
Ask specifically for cough, night sweats, TB contact (Lost of weight, is not easy in pregnancy)
Examine the mother systematically looking for complications of HIV
If any of the above, sent patient for CXR and sputum induction (request TB culture on the laboratory form)
Sent urine for MCS and do urine PCR only if pus cells in the urine (no routine ESR, CXR or urine PCR)
If suspect TB, refer to the hospital for management.
Do FBC(or HB) and CD4 count, Blood group and RPR at the first Visit
Give all women with reactive HIV test single dose NVP 200mg at 28 weeks to keep with them and take it if in labour or rupture of membrane (not to be repeated if false labour)
In addition AZT 300mg PO 12hrly must be given to these mothers with HB> 7 from 28 weeks.
If HB<7 investigate for anaemia (if clinic refer to the hospital)
Supplement mothers with HB between 7 and 10 with FeSo4 I TDS and follow them 2 weekly and check HB. If above 10, 4 weekly follow up is acceptable.
If HB is 10 and above , give FeSo4 I bd and check HB 4 weeks later.
Give multivitamins I dly
Refer all women who qualify for HAART to appropriate centre.
Do CD4 count 6/12 in all women who do not qualify for HAART
Document on the Antenatal card when dual therapy or HAART was started.

WARD LABOUR

Mothers who present in labour ward for the first time with unknown HIV status must be offered HIV test if in latent phase.
All patients must take sdNVP and AZT 3hrly as 300mg until delivery

No routine episiotomies, ROM, ceaserian sections and suctioning of infants
Clean vagina with chloherxidine with each PV and limit PV examinations
Consider antibiotics (Erythromycin 500mg 6hrly and Flagyl 400mg 8hrly PO if severe immunosupression)
Give the neonate single dose NVP (before they leave labour ward) and document it on Page 19 of the delivery book . Doses as follows:

<1000g- 0.2 ml
1100g-1500g- 0.3ml
1600g-2000g- 0.4ml
>2000g- 0.6ml

All neonates to receive AZT syrup at 0.4ml/kg PO. 12hrly for 7 days if mother was on HAART or AZT for 4 weeks or more. Any treatment less than that means that the neonate must get AZT for 28 days.

All mothers must be seen within 3 days of discharge at the local clinic for check-up

INFANT FEEDING OPTIONS

Antenatally or at convenient contact with the mother, Counsel about feeding options and apply AFFAS criteria
If AFFAS met, encourage and support patient for exclusive breastfeeding (EBF) for 6/12
Infant to be tested at 6 weeks and if reactive, continues EBF until 2 years
If infant non-reactive at 6 weeks, reapply AFFAS criteria and decide with the mother the best infant feeding option then.
If Exclusive formula feed continue for 6/12 and re-test 6 weeks after stopping.

AFFAS CRITERIA:

ACCEPTABLE: Can she use formula milk daily and consistently without Social stigma and cultural limitations?

FEASIBLE: Is the enough resources, does she understand Formula feeding? Is there support?

AFFORDABLE: Can she afford the cost consistently without compromising Rest of the family. Does she have appropriate storage?

SUSTAINABLE: Can she afford this for 6/12 continuously?

SAFETY: Clean water, utensils and storage available?

INFANT FOLLOW UP

All receive bactrim at 6 weeks and PCR is done.
Bactrim to be stopped if PCR comes back negative.

Screening for infections (excluding HIV)

Some useful definitions

Amniotic fluid infection: an infection of the amniotic fluid, usually caused by organisms coming up from the vagina and through the cervix and infecting the membranes. Once the membranes are infected, the organism easily spreads to the amniotic fluid. Amniotic fluid infection is difficult to diagnose, but is responsible for many complications in pregnancy, mainly pre-term labour and stillbirths.

Asymptomatic bacteriuria: a UTI without symptoms. Although the women are unaware that they have an infection, they can develop pyelonephritis, have pre-term labour or deliver a low birth weight baby. These complications can be prevented if the asymptomatic bacteriuria is diagnosed and treated.

Syphilis: a common sexually transmitted infection that can cause congential abnormalities or lead to the death of the baby. It can also lead to maternal deaths if it remains untreated for a long time. Syphilis is a very important infection to target in pregnancy because it causes many deaths, mainly stillbirths. Although there are almost always no symptoms of the disease, it is easy to test for and treatment is cheap and effective. If it can be detected and treated then the woman and baby can be cured and the complications prevented.

Urinary tract infection (UTI): an infection in the urethra or bladder that can spread up to the kidneys (pyelonephritis). It usually causes symptoms like burning when the woman passes urine, or frequency of urination (the woman has to go often to pass urine, even at night). A UTI can cause the woman to go into labour. It sometimes occurs with amniotic fluid infections.

Vaginitis: an infection where there is excessive, foul-smelling, yellowish discharge from the vagina. The woman may experience itchiness of the perineum (area surrounding the vagina). Vaginitis is an important condition because it has also been shown that women with vaginitis are more likely to go into pre-term labour and to stillbirths. Treatment of the vaginitis might help prevent these complications, and it will also relieve the woman's discomfort.

Why should there be screening for infections?

Infections are a major cause of maternal and perinatal morbidity and mortality. There are three categories of infection:

Congenital infection – an infection in pregnancy where the organism infects the fetus as well as the mother. The most important example is syphilis (see above). Other important congenital infections are mainly caused by viruses like rubella. Unfortunately, once the pregnant women are infected there is not much that can be done. Therefore it is important for women to be immunised (eg. against rubella) to prevent infections from occurring.

Uro-genital tract infection – an infection of the uro-genital tract (*uro = urethra, bladder, ureters and kidney; genital = vagina, cervix, uterus and fallopian tubes*) by an organism (usually a bacteria). These infections have a direct effect on the pregnancy, often causing pre-term labour or stillbirths. The most common category of perinatal deaths in South Africa is 'unexplained stillbirths'. Spontaneous pre-term labour is the third most common known cause. Some years ago a study in Durban involving post-mortems of babies found that amniotic fluid infection was the most common cause of death (almost 1 in 3 deaths). The deaths from infection were due to both stillbirths and neonatal deaths following pre-term labour. Therefore, if these infections are detected, they can be treated and the complications prevented. Unfortunately, amniotic fluid infections are difficult to detect and diagnose without expensive special tests. If these tests are not done then the disease is cannot be officially diagnosed, so amniotic fluid infections do not appear as a common cause of death in South African statistics. However the Durban study suggests that, if a simple method for diagnosing the infections was developed, amniotic fluid infections might be recognised as being the most common cause of perinatal death. Other important uro-genital infections are urinary tract infections, asymptomatic bacteriuria and vaginitis (see above).

General infection – an infection in which the organism affects the whole body. Examples are HIV, tuberculosis and malaria. These infections are very important as they affect the health of the woman and can lead to her death if not diagnosed and treated properly.

How should screening for infections be performed?

All pregnant women should be screened for infections early in the antenatal period, and questioned about the following symptoms of infections at each antenatal visit:

- Vaginal discharge
- Cough and breathing difficulty
- Weight loss
- Night sweats
- Diarrhoea
- Fever

Syphilis screening is best done on-site at the clinic using the RPR test. The results are available immediately and treatment can be started the same day. (See CD on obstetric skills, PEP Maternal Manual Skills Workshop 1-4, and IMPC – C7 and L5)

Urinary tract infection screening is best done by culturing a midstream urine specimen, but this is not practical in the primary clinic setting. A simpler method, although not as accurate, is the use of urine dipsticks to test for nitrites and leucocyte esterase.

What should be done there if there is an infection?

Syphilis should be treated immediately with penicillin if the woman is not allergic or erythromycin if she is. If the RPR is positive and there is no previous test or titre, treat for late syphilis.

- Benzathine benzylpenicillin, IM, 2.4 MU once weekly for 3 weeks
- Erythromycin, oral, 500mg 6 hourly for 1 month if allergic to penicillin

UTI should be treated using ampicillin or bactrium

Vaginitis should be treated using the syndromic approach to STIs.

- Ceftriaxone, IM, 125 mg immediately
- Erythromycin, oral, 500 mg for 7 days
- Metronidazole, oral, 400 mg 12 hourly for 7 days.

If the woman has symptoms of general infection, such as cough, weight loss and fever, she should be referred to hospital for further investigation.

Counselling for congenital abnormalities

Some useful definitions

Congenital abnormality: an abnormality that the baby is born with, for example clubbed feet. There are many causes of congenital abnormalities. Toxins such as alcohol can damage the fetus, abnormalities in the hereditary material (chromosomes) often result in server abnormalities, and congenital infections (see above) can also cause damage. It is important to try to diagnose any abnormalities before the baby is born, so that the mother and baby can be helped as much as possible. An early diagnosis of a congenital abnormality also gives the mother options about the future of the pregnancy. All women 35 years or older are at risk of having babies with congenital abnormalities, and should be counselled accordingly.

Why should there be counselling for congenital abnormalities?

Birth defects and genetic disorders are having an increasingly important impact on South Africa's perinatal mortality and morbidity. Looking after these children also places a large burden on the family and on society. Many congenital abnormalities can be detected during pregnancy and various options for treatment discussed. However, before any treatment options can be discussed, the congenital abnormalities need to be identified.

Who should be counselled?

- There are some women who have an increased risk of a congenital abnormality in the fetus:
- Women 35 years or older
- Women who have had 3 or more first trimester abortions
- Women who have had a previous child with a genetic disorder or birth defect, or family members affected by a specific genetic disorder
- Women with alcohol and or other drug exposure during pregnancy
- Women with diabetes mellitus

How should the counselling be performed?

All institutions offering maternity care should have nursing staff trained to provide genetic counselling. Unfortunately this goal has not been reached. However, all pregnant women can be informed of certain facts and those at particular risk of an abnormality can be referred for further counselling and testing.

All women should be provided with the following facts:

- The risk of a severe congenital abnormality increases with maternal age
- Alcohol causes severe abnormalities in fetuses and alcohol should not be taken at all during pregnancy
- The risk of an abnormality is higher if the parents are related to each other
- The risk of an abnormality is increased if there is a family history of genetic disorders

- Neural tube defects (very serious abnormalities) can be prevented if the woman takes folic acid for three months before the pregnancy, and for at least the first trimester (three months)

What should be done if the woman agrees to go for testing?

If the woman wants to be tested, an appointment should be made for her at the appropriate referral unit. It is important to note that testing should be performed before 20 weeks gestation, so there might be some urgency in getting the woman to the appropriate place in time.

Can congenital abnormalities be prevented?

Yes.

- Neural tube defects can be prevented if folic acid is given before and during the pregnancy
- Fetal alcohol syndrome can be prevented if no alcohol is taken during pregnancy

Monitoring Fetal Movements

Why should fetal movement be monitored?

Before a fetus dies, it stops moving. When one is ill or starving, one does not run around but instead lies down and rests. The fetus does the same. There is often a long time between the decrease and stopping of the fetus' movements and his/her death, which gives health care providers an opportunity to intervene and save the life of the fetus.

In the *Saving Babies* reports, the lack of response to poor fetal movements by the pregnant women was noted as one of the most common avoidable factors in perinatal deaths. An inappropriate response of the pregnant woman was recorded in 5-10% of all perinatal deaths. Potentially, if all women responded appropriately to poor fetal movements, a large number of lives could be saved.

Therefore, the monitoring of fetal movements must become a key component of the health education given to pregnant women, and also emphasised in community and school health education. If there was a general awareness of the importance of monitoring fetal movements by the general public, many fetus' lives could be saved.

How should fetal movements be monitored?

The pregnant woman herself is the best "tool" for monitoring fetal movements. The woman should be alerted to the importance of being aware of fetal movements, and be informed to report to the clinic if the movements decrease.

In cases where the fetus is at risk of becoming ill or starving (for example in IUGR, possible post-maturity, or women with hypertension), the woman should be instructed to count the fetal movements at a set time for an hour each day. A fetal movement chart should be given to the woman. She should record how many times the fetus moves in the hour. If the fetus moves less than 4 times in the hour, she should continue counting for the next hour. If the fetus still is not moving more than 3 times in the hour, the woman should immediately report to the clinic or hospital so that further investigations can take place. If the number of times the fetus moves is less than half of what it usually moves, the woman should also go to the clinic or hospital, as above. A decrease in movements when compared with previous observations is more important than the total number of movements felt during an observation period.

What should be done when there are no or poor fetal movements?

At the clinic or hospital, if the woman complains of poor fetal movements then the health care provider should listen for the fetal heart beat (using a fetal stethoscope or doptone) to determine whether the fetus is still alive.

If no heartbeat can be detected, the fetus might be dead and the woman must be referred to hospital to confirm whether this is the case.

If the fetal heartbeat is heard, then the heart rate should be monitored using a cardiotocograph (CTG) machine. Most clinics have a CTG machine, or if not, there will be one at a hospital or health centre nearby. The woman must be referred the same day for a CTG. Advanced midwives must be able to perform and interpret a CTG trace.

The CTG may be normal or indicate fetal distress. If fetal distress is indicated, then the baby needs to be delivered, usually by caesarean section. If the fetal heart rate pattern is normal, the woman should be given a fetal kick chart (see example below) and asked to come back in 1 week.

If there is no CTG machine at the clinic and the woman cannot go the hospital or health centre then the woman should be advised to rest at the clinic and monitor the fetal movements for the next six hours. If there more than 3 movements in those hours the woman can go home, but must repeat the count the next day. If there are 3 or fewer movements then the pregnant woman must be referred urgently to hospital, by calling an ambulance in necessary.

Antenatal Kick Chart

Daily counting of your baby's movements provides valuable information about your baby's condition.

Choose any period of an hour long for the counting. Count while you are resting lying on your left or right hand side. Mark each movement on the chart.

If the baby has moved **more than 4 times** before an hour has finished, you can stop counting. If the baby moved **less than 4 times** in an hour, then repeat the counting for another hour. If there are still **less than 4 movements in the second hour** of counting, you must **urgently visit the hospital** for further assessment of the condition of your baby.

DATE	TIME	NUMBER OF MOVEMENTS

Part 5 - Special Supervisor Skills

Supervisors of clinics need information to know how well the clinic is functioning. This section outlines how to perform quality assurance of the antenatal care provided at the clinic, gives the basic clinic data required by the regional offices, and lists the essential drugs and equipment that must be at the clinic.

Clinical supervision

As mentioned in Part 1, supervision of antenatal care can be divided into clinical supervision and administrative supervision. The clinical supervisor should be the staff member with the most skill at antenatal care. Ideally, this supervisor would check each pregnant woman's antenatal card and checklist at the first visit and again at the 32-week visit to ensure that the clinic is providing adequate care. If there is any uncertainty about the accuracy of the midwife's findings, then the supervisor must check the findings at every visit until she is satisfied with the accuracy and completeness of the findings. The clinical supervisor is responsible for training other health care providers in antenatal care and answering any questions.

It is recognised that these standards are not always easy to meet in some clinics. That does not lessen the need to state the basic minimum standard for antenatal care. If the standard has not yet been attained, this deficiency must be recorded and efforts must be made to meet the standards as soon as possible. This is what the principle of equity means when describing *primary health care for all*.

Another point needing emphasis is that every woman who is found to be ineligible for BANC must have access to a clinic that performs high-risk antenatal care. This may be in the local clinic with care given by a doctor, or at the high-risk antenatal clinic in the nearest hospital.

At good way to detect problems and to know where to focus staff training is to perform a quality assurance analysis of the antenatal cards. The antenatal card is of no use if the original observations are incorrect. Therefore, the clinical supervisor must check the clinical skills of the other health care providers. The essential clinical skills are:

- Taking a history
- Measuring blood pressure
- Examining for anaemia, malnutrition (U-MAC) and other general signs of illness
- Measuring the symphysis-fundus height
- Plotting the SF measurement
- Determining the lie of the fetus
- Testing the urine
- Measuring the haemoglobin level

The clinical supervisor should observe the method of examination of the other health care providers and double-check the findings. Where necessary the appropriate skills should be taught to the health care provider.

Quality assurance analysis of antenatal care

To ensure that high standards of record keeping are maintained and that protocols (and guidelines) are being followed, the quality of the antenatal care must be frequently checked. If quality is not monitored, standards of care drop resulting in increased mortality rates.
A quality assurance checklist has been developed by Professor Hugh Philpott and Ms Anna Voce (see below). There are 3 sections: history, examination and interpretation & decision-making. All 25 points are essential in antenatal care, and should be recorded appropriately on the woman's antenatal card. At certain stages of the antenatal care, every item on the checklist must be double-checked to ensure that nothing has been missed. Any diagnoses must be correct, and decisions made about referral or treatment must be accurate. There are no second chances if something is missed. One midwife cannot take on this responsibility alone. The midwife must be supported by a supervisor who reviews all findings and decisions with her. This should be done after the first visit and the 32-week visit.

Audit of the antenatal card is conducted to determine whether:

- the information is accurate and complete
- the right decisions were being made

It is recommended that the clinic supervisor should conduct an audit on a monthly basis, until the standards of care are high. The audit can then be performed quarterly. A percentage score is given for each antenatal card checked. An average score can then be given for each health facility and then a combined score for each sub-district.

The steps taken in conducting the quality check are as follows:

1. Each month, examine 25 (or fewer if this is not possible) consecutive antenatal records of pregnant women who are at least 38 weeks pregnant, as the women leave the antenatal clinic.
2. For each antenatal card, score each of the 25 items listed in the quality check form, according to the scoring criteria shown below. This will give a maximum score of 25 points, which, if multiplied by 4, will give a percentage score. Record all scores on a single data sheet like the one illustrated after the quality check form below.
3. Record the commonest items missing in the records
4. Record the major reasons for:
- Incomplete record keeping
- Incomplete decision-making
5. Answer the question: What will you do to improve the quality of record keeping and decision-making?

Quality Check for Antenatal Records

Each month examine 25 antenatal cards (if possible) of women who are at least 38 weeks pregnant. Check for each of the 25 criteria listed below, and score them according to the set scoring criteria (next page).

History:

1. Age, parity and gravidity
2. Details of previous pregnancies, including causes of death and indications for operations
3. Previous illnesses that might influence this pregnancy including cardiac, renal and diabetic disease
4. History of the present pregnancy
5. The date of the first day of the last normal menstrual period (LNMP) and the expected date of delivery (EDD)
6. The estimated period of gestation correctly plotted on the antenatal graph at the first visit

Examination:

7. Maternal height and weight, U-MAC
8. Blood pressure recorded at each visit
9. Heart examination for cardiac disease
10. SFH correctly plotted at each visit on the antenatal graph according to the EDD
11. Estimation of whether there is evidence of IUGR according to SFH measurements
12. Fetal presentation, recorded from 34 weeks onwards
13. Fetal heartbeat heard or fetal movements felt
14. Urinalysis for proteinuria and glycosuria
15. Haemoglobin and Rh group
16. Syphilis test result
17. Counselling for HIV testing
18. Tetanus toxoid

Interpretation and decision-making:

19. Identification and recording of risk factors, their severity and significance
20. Record of action plan, including interventions and referral if indicated
21. Decision on place for delivery discussed with mother and recorded
22. Transport arrangements for labour discussed with mother
23. Decision taken by mother regarding future family planning
24. Double-checking and counter-signing of findings of the 1st and 32-week visits by an ADM, doctor or senior, experienced midwife.
25. Date of next visit

This will give a maximum score of 25 points.

For each ANC record assessed, record: **Total:_____/ 25**

Multiply by 4 = _____%

Quality Check for Antenatal Records - Criteria

1. Age, parity & gravidity
0 = *not completed*
½ = *either age or parity/gravidity completed*
1 = *all completed*

2. Details of previous pregnancies, including causes of death & indications for operations
0 = *absent/incomplete information*
1 = *all details recorded*

3. Previous illnesses
0 = *no evidence that each section addressed*
1 = *each section marked or evidence that all addressed (eg "none of the above")*

4. History of present pregnancy
0 = *no/inadequate notes about the pregnancy*
1 = *notes about the well-being of the woman and the progress of the pregnancy*

5. LNMP & EDD
0 = *no information in table or wrong method used to calculate EDD (eg sonar after 24wks)*
1 = *EDD accurate +/- 3 days*

6. Estimated gestation plotted on graph at 1st visit
0 = *inappropriate method (50th percentile v gestation) or incorrect calculation*
1 = *correct plotting*

7. Maternal height & weight
0 = *neither completed*
½ = *one completed*
1 = *both completed*

8. BP at each visit
0 = *BP not recorded on one or more occasion*
1 = *BP recorded at all visits*

9. Heart examination
0 = *no evidence of heart examination*
1 = *heart examined*

10. SFH correctly plotted on graph
0 = *SFH plotted incorrectly or not at each visit*
1 = *SFH plotted correctly at each visit*

11. Estimation of IUGR
0 = *not able to be estimated (ie if #**10**=0) or if IUGR evident but not acted upon*
1 = *appropriate action taken*

12. Fetal presentation from 34wks
0 = *no fetal presentation recorded from 34wks*
1 = *fetal presentation at any visit from 34wks*
**if no visit from 34wks, leave blank and calculate score out of total of 24*

13. Fetal heart or fetal movements
0 = *no record*
1 = *any record of FHR or fetal movements*

14. Urinalysis for proteinuria & glycosuria
0 = *urinalysis not done on 1+ occasion*
1 = *urinalysis at all visits*

15. Hb & Rh
0 = *<1 Hb and Rh*
½ = *1 Hb + Rh or 2 Hb*
1 = *2 Hb + Rh*

16. Syphilis test result recorded
0 = *no RPR result*
1 = *RPR result recorded*

17. HIV counselling
0 = *no record of counselling*
1 = *any record of counselling (VCT or code)*

18. Tetanus toxoid
0 = *no tetanus toxoid given*
1 = *tetanus toxoid given (booster/ full course)*

19. Identification & recording of risk factors in problem list table
0 = *risks present but not recorded*
½ = *some risks recorded on problem list*
1 = *all risks recorded /no risks present*

20. Record of action plan including intervention & referral if indicated
0 = *problems identified but no action taken*
½ = *some problems addressed*
1 = *action for all probs/no probs present*

21. Delivery discussed with mother
0 = *location of ANC & delivery not indicated*
1 = *location of ANC & delivery recorded*

22. Transport arrangements for labour
0 = *no notes about transport*
1 = *evidence of discussion of transport*

23. Decision re future family planning
0 = *no discussion of family planning*
1 = *evidence of discussion of family planning*

24. Countersigning of 1st visit & 32 wk visit
0 = *no sign of quality check*
½ = *double-checking of card at 1 visit*
1 = *double-checking of card at both visits*

25. Date of next visit recorded
0 = *no record of future visit*
1 = *future visit recorded at any stage (TCB)*

Criteria	Date:																										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**Total**	**%**
Gestational age at booking (wks)																											
History																											
Age, Parity, Gravida																											
History prev preg																											
Prev illness																											
History present preg																											
LNMP, EDD																											
Plotting of gestation @ 1st visit																											
Examination																											
Maternal height & weight																											
BP (each visit)																											
Heart examination																											
Correct plotting of SFH																											
Presence of IUGR detected																											
Fetal presentation (from 34 wks)																											
Fetal heart & movements																											
Urinalysis																											
Hb, Rh																											
Syphilis test results recorded																											
HIV counselled																											
Tetanus toxoid given																											
Interpretation & decisions																											
Identification/recording of risks																											
Action plan & interventions																											
Discussion of labour with mother																											
Transport arrangements																											
Family planning																											
1st & 32wk visits countersigned																											
Date of next visit																											
Total																											
%																											

Administrative supervision

Every clinic must have an administrative supervisor who is responsible for: the collection of the routine data required by the regional office; ordering of drugs and equipment; and ensuring that equipment remains in good condition, and is replaced or sent immediately for repairs if necessary. The supervisor should also ensure that the clinic environment is positive, with adequate privacy for patients, clean consulting rooms etc. The administrative supervisor is usually the facility manager.

Basic data collection

Data in the clinic register should be checked daily. Check that all the items are recorded in the register, so each month the data required by the regional office can be easily calculated.

The basic antenatal data required by the regional offices are:

- Number of women attending for antenatal care for the first time
- Number of women starting antenatal care before 20 weeks gestation
- Number of women attending for follow-up visits
- Number of women counselled for HIV testing
- Number of women tested for HIV
- Number of HIV infected women
- Number of HIV infected women on antiretroviral (ARV) treatment
- Number of women screened for syphilis
- Number of women who had positive syphilis serology
- Number of women treated for syphilis
- Number of women pregnant 18 years old or younger
- Number of women pregnant 35 years old or older
- Number of women referred for further evaluation
  - at the first visit
  - at follow-up visits

This information can be collected in the register by using the first visit checklist and recording the number of women seen for antenatal care at the reception area each day. These numbers can be added up each week to get the number of visits per week. It can also be calculated per month. If the checklists are used, further information can be obtained. For example, the number of women attending antenatal care three or more times.

Equipment, supplies, drugs and tests for antenatal care and emergencies

The administrative supervisor is responsible to ensure that the following are kept in supply and in good working order:

Warm, clean room

- Examination table or bed with clean linen
- Light source
- Heat source

Hand washing

- Clean water supply
- Soap
- Nail brush or stick
- Clean towels

Waste

- Bucket for soiled pads and swabs
- Receptacle for soiled linens
- Container for sharps disposal

Sterilization

- Instrument sterilizer
- Jar for forceps

Miscellaneous

- Wall clock
- Torch with extra batteries and bulb
- Clinic register
- Records
- Refrigerator

Equipment

- Blood pressure machine and stethoscope
- Body thermometer
- Fetal stethoscope
- Baby scale

Supplies

- Gloves:
  - utility
  - sterile or highly disinfected
- Urinary catheter
- Syringes and needles
- IV tubing
- Suture (tear/episiotomy repair)
- Antiseptic solution (iodophors or chlorhexidine)
- Spirit (70% alcohol)
- Swabs
- Bleach (chlorine based compound)
- Condoms

Tests

- Pregnancy test
- RPR testing kit
- Rapid Rh
- HIV testing kits
- Urine dipsticks that measure protein, glucose, nitrites and leucocytes
- Container for catching urine

Disposable delivery kit

- Plastic sheet to place under mother
- Cord clamps(sterile)
- Sterile blade

Drugs

- Oxytocin
- Ergometrine/misoprostil
- Magnesium sulphate
- Calcium gluconate
- Diazepam
- Hydralazine/Nifedipine
- Ampicillin
- Gentamicin
- Metronidazole
- Benzathine penicillin
- Cloxacillin
- Amoxycillin
- Ceftriaxone
- Trimethoprim + sulfamethoxazole
- Clotrimazole vaginal pessary
- Erythromycin
- Ciprofloxacin
- Tetracycline or doxycycline
- Nevirapine or zidovudine
- Lignocaine
- Adrenaline
- Ringer lactate
- Normal saline 0.9%
- Glucose 50% solution
- Water for injection
- Paracetamol
- Iron and folic acid tablets
- Calcium supplementation
- Mebendazole
- Sulphadoxine-pyrimethamine

Vaccine

- Tetanus toxoid