Elements of physiology and management of pregnancy, delivery and afterbirth in resource limited settings

MINGHA AFRICA ONLUS

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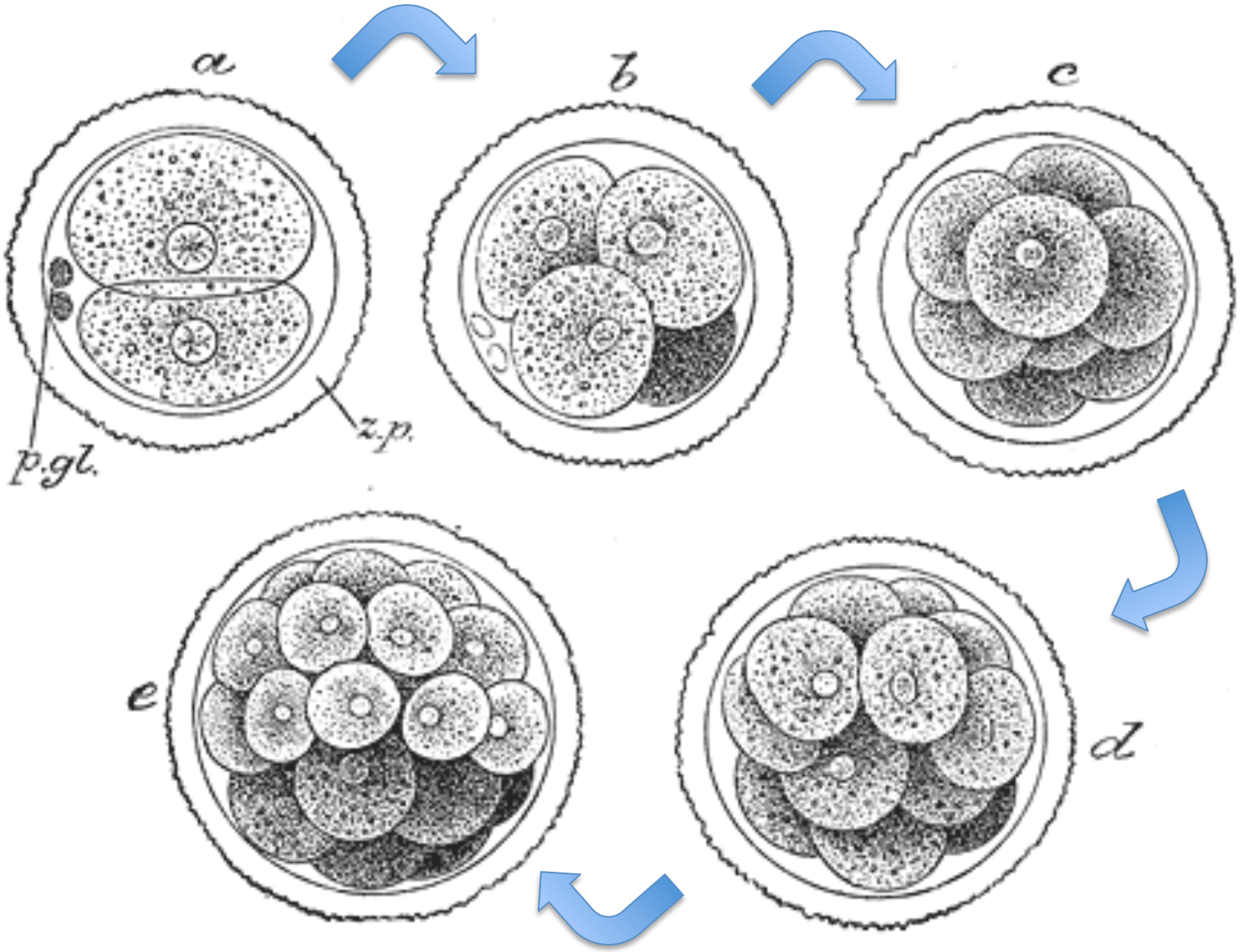
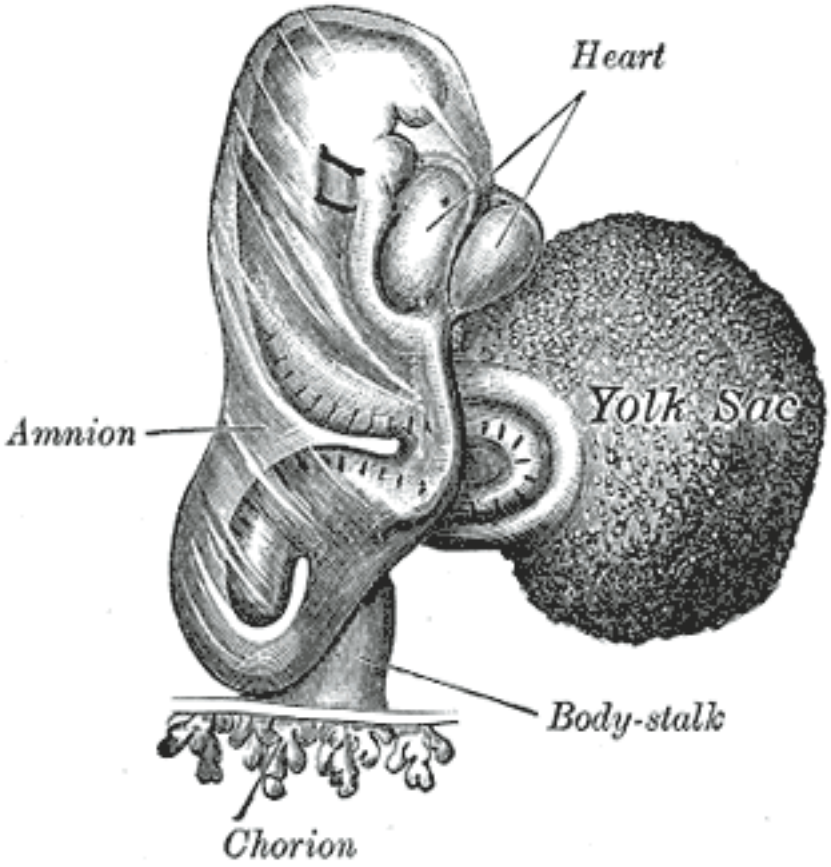
“Baby” development during pregnancy

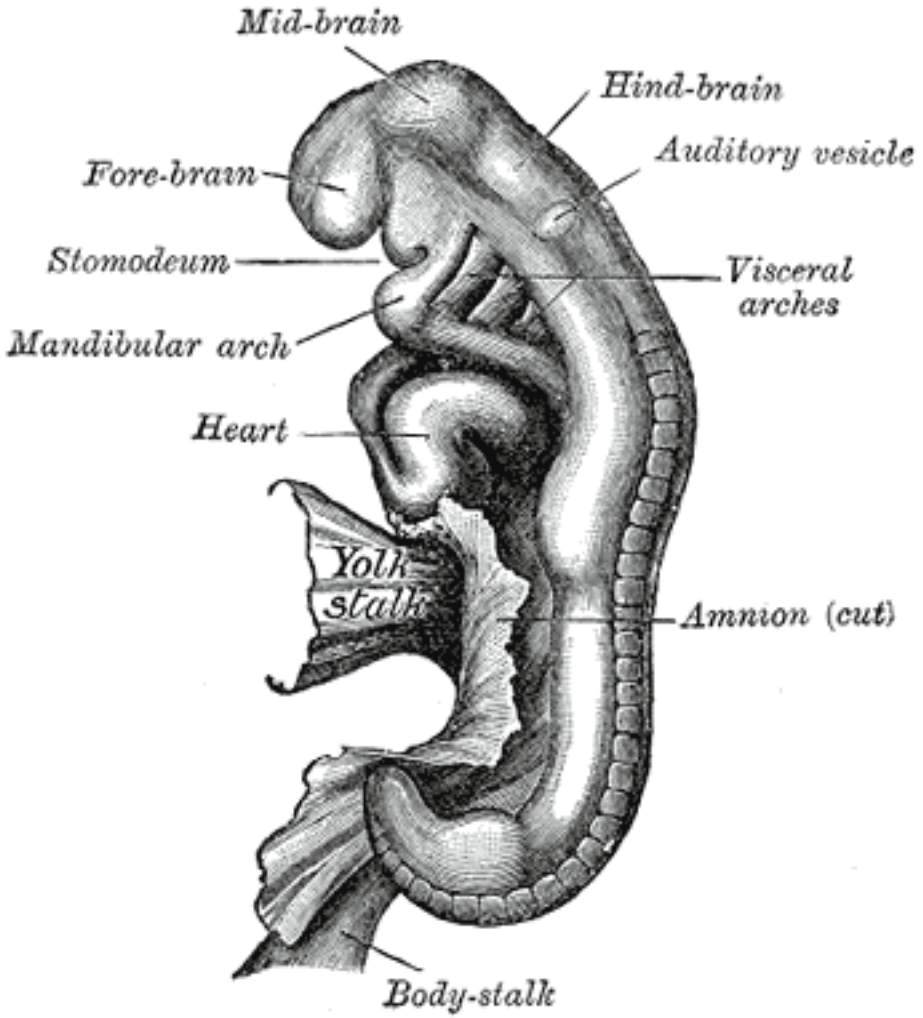
Cellular segmentations after fecundation



Embryon 15 days older

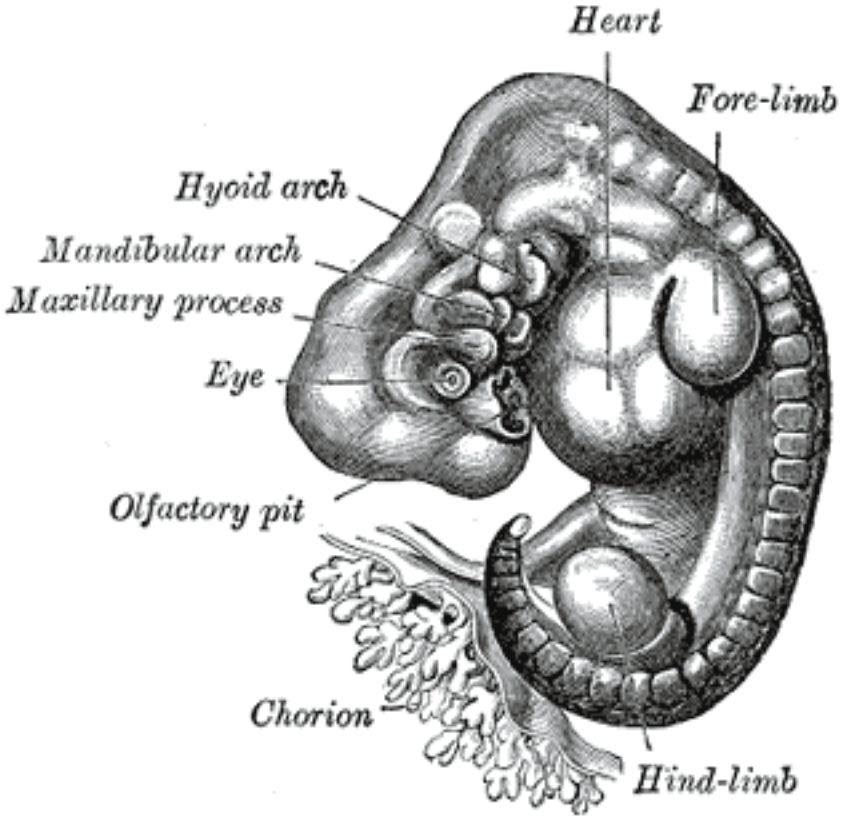
Embryon 21 days older

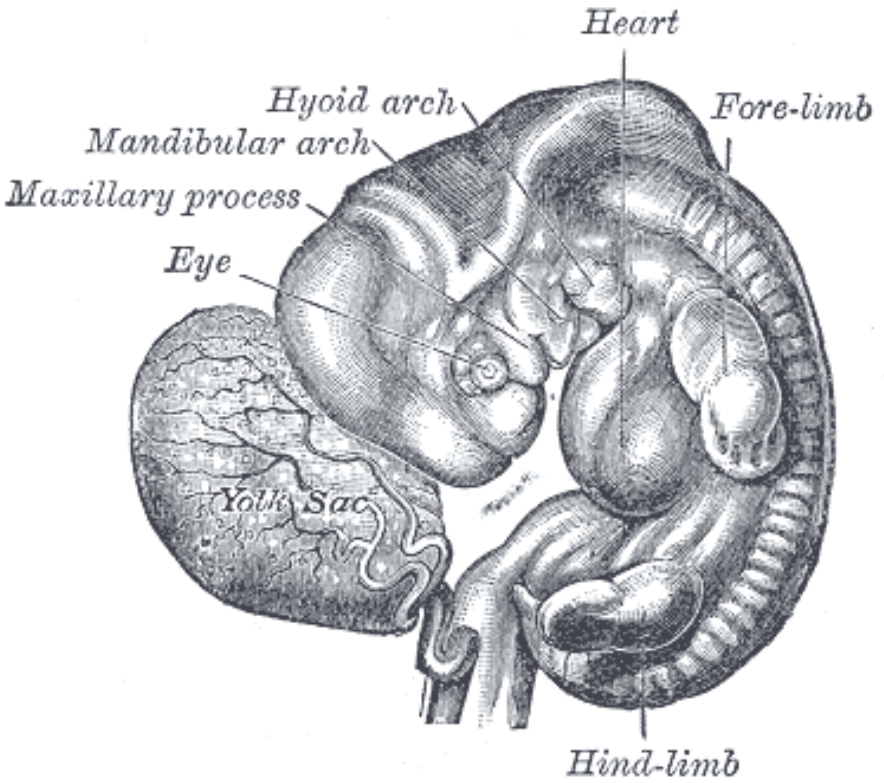




Embryon 27-30 days older

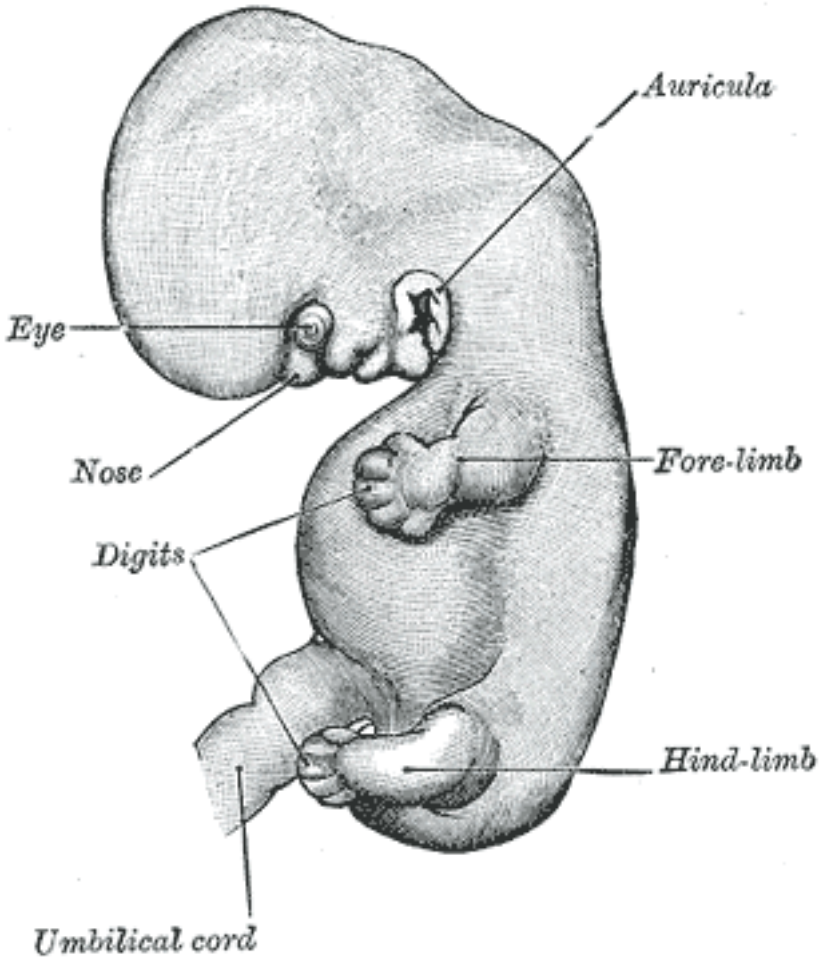
Embryon 31-34 days older

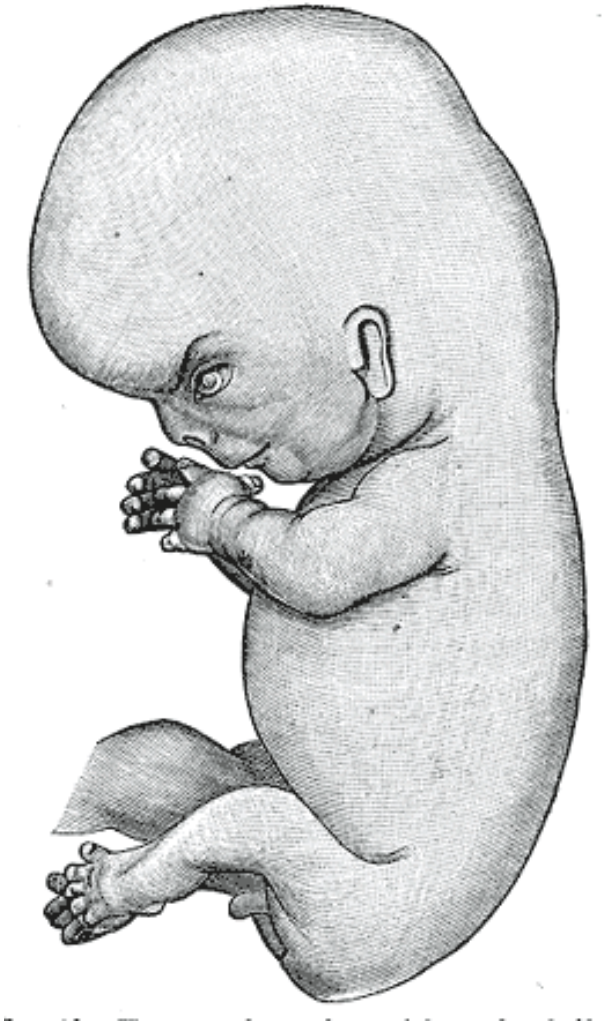




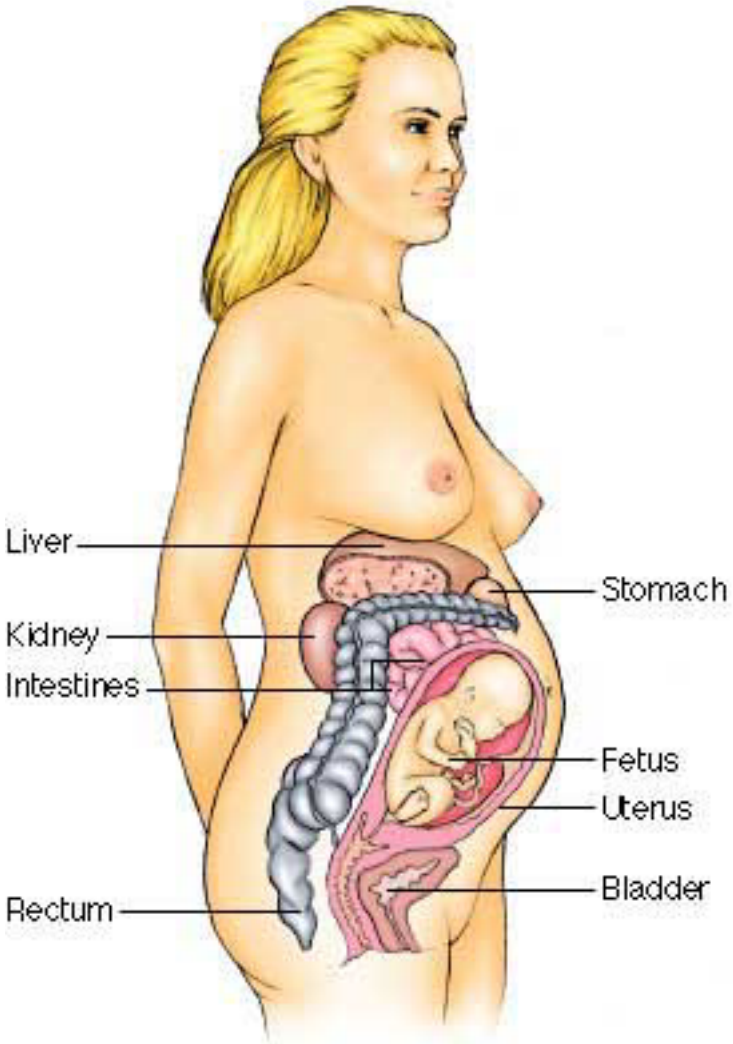
Embryon 40-42 days older

Embryon 60 days older

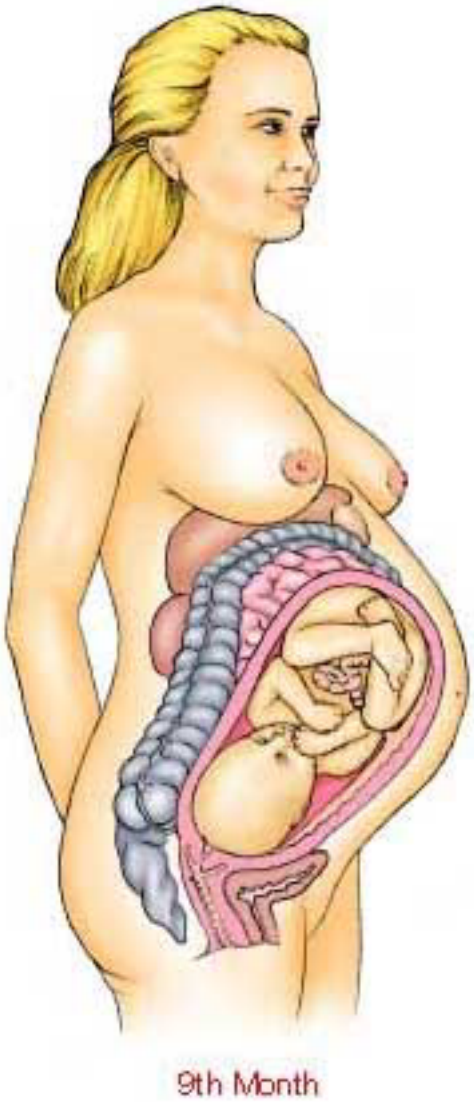




Pregnancy of 6 months

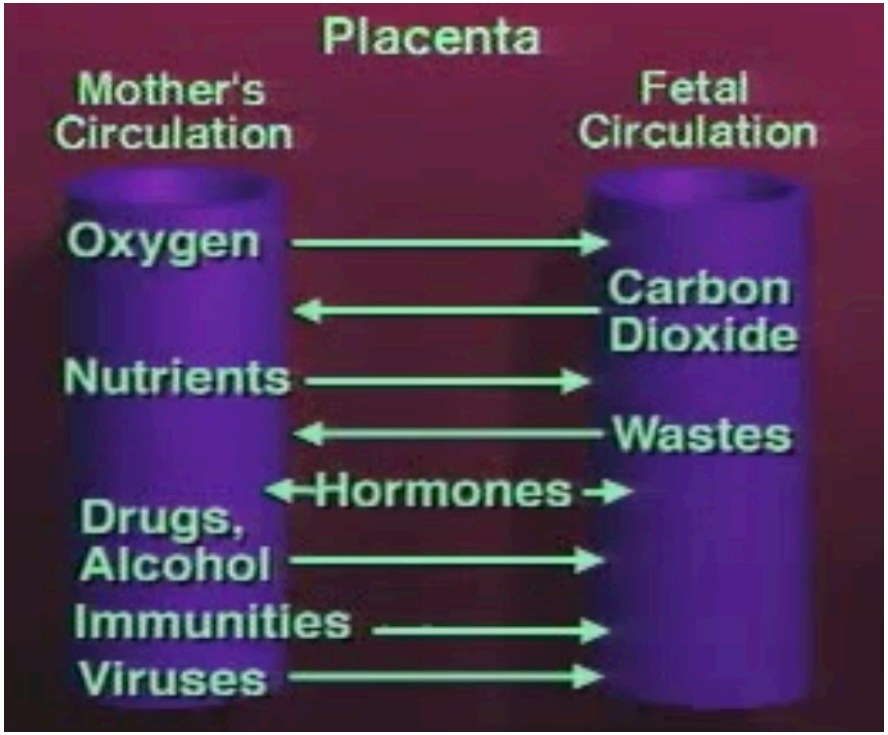


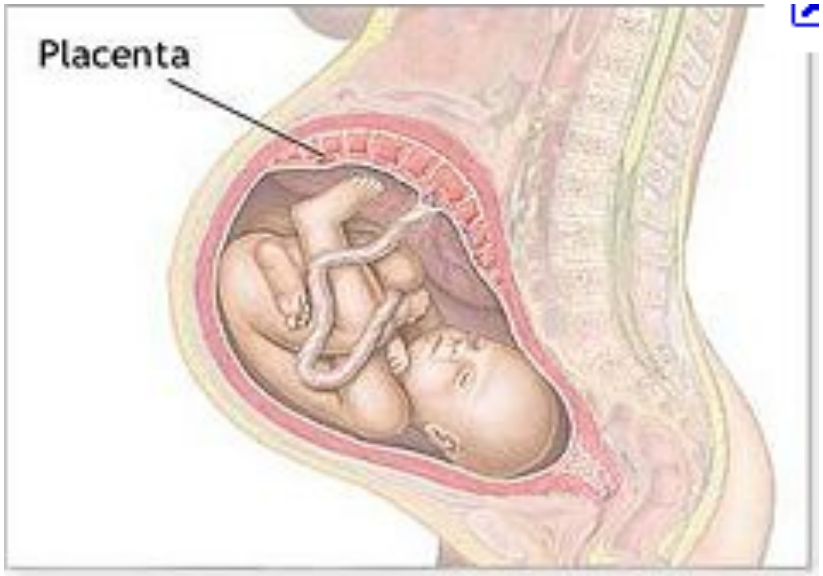
Pregnancy of 9 months



Placenta

Placental functions:
- Transporting nutrients and oxygen
- Passage of maternal protective antibodies (…IgM produced during primary maternal infections don't pass across the placenta…)
- Removing wastes
- Producing hormones (beta-HCG, Progesterone, Estrogens)





Physiological Placenta Implantation on Uterus posterior wall

Ante-Natal Consultation

At the 1st antenatal consultation remember…

- Register obstetrical/gynaecological history
- Register medical mother's history
- Register familiarity for diseases (hypertension, diabetes, genetic abnormality as sick cells anaemia, etc.)
- Mother's Vaccination status

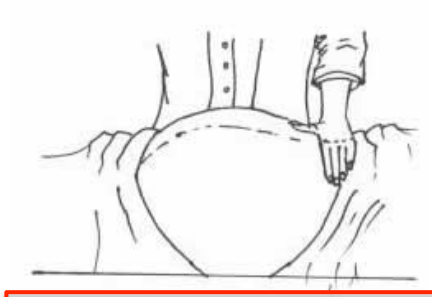
….Check at every antenatal consultation….

- Date
- Week's pregnancy
- Weight
- Abdominal circumference
- Blood pressure
- Uterus size (Fundal height measurement)
- Conjunctive and mucosal colour
- Foetal presentation
- Vaginal exam
- Presence of active foetal movement
- Presence of foetal cardiac beat
- intermittent Preventive Treatment for Malaria

Fundal height measurement

Observational data indicates that the weight increase during pregnancy is variable among women within a range from 7 to 18 kilos for women delivering 3-4 kilos babies

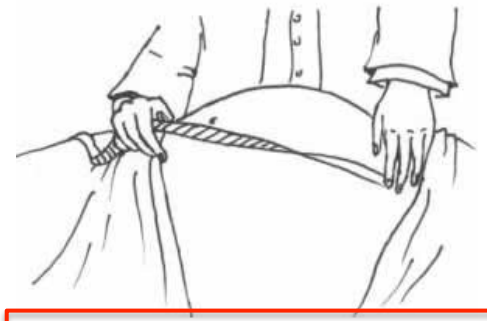
1. Mother semi-recumbent, with bladder empty.



2. Palpate to determine fundus with two hands.

3. Secure tape with hand at top of fundus.

4. Measure to top of symphysis pubis.



5. Measure along longitudinal axis of uterus, note metric measurement.

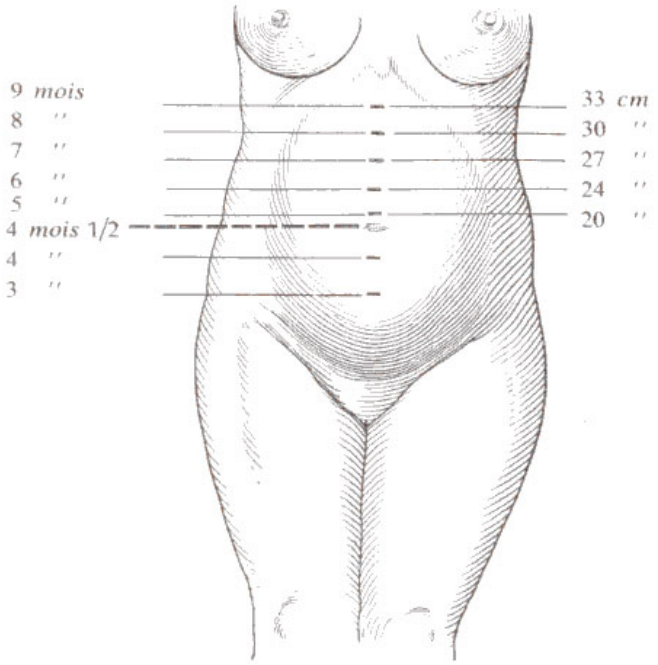


FIG. 92. — *Hauteur de l'utérus aux différents âges de la grossesse.*

Minimum of Lab Exam to be performed during pregnancy follow-up

	1st trim.	2nd trim.	3rd trim.
Blood count (or at least HGB level)	Yes	Yes	Yes
Microscopic direct microbiological exam of vaginal secretions	Yes	If symptoms	If symptoms
Gluco-stick	Yes	Yes	Yes
Microscopic direct microbiological exam of faeces	Yes	If symptoms	Yes
Urinary stick	Yes	Yes	Yes
VDRL-TPHA	Yes	No	Yes if first test neg
HIV test §	Yes		Yes if first test neg
HBsAg*	Yes		Yes if first test neg
Tick Blood Test for malaria	Yes	Yes	Yes
Blood group	Yes		

* If the mother is HBsAg pos, there is the indication to administer to the newborn (within 24 h from birth) a dose of Immunoglobulin and the first dose of HBV-vaccine. The injection must be done in two different anatomic places.

§ if the mother is HIV pos start the PMTCT activities according to the trimester of screening

Note: if there is history of sickle cell anaemia in the family there is indication to do the electrophoresis of haemoglobin for both partners

Vaccination and pregnancy (1)

The following vaccines are considered safe to give to women who may be at risk of infection:

- **Hepatitis B -** Pregnant women who are at high risk for this disease and have tested negative for the virus can receive this vaccine. It is used to protect the mother and baby against infection both before and after

- Tetanus/Diphtheria -This combination of vaccines are routinely recommended for pregnant women, both those who have never been immunized and those who have not received a booster in 10 years.

Vaccination and pregnancy (2)

Which vaccines should pregnant women avoid?

The following vaccines can potentially be transmitted to the unborn child and may result in miscarriage, premature birth, or birth defects:

- **Measles, Mumps, Rubella** (MMR) - Women should wait at least three months to become pregnant after receiving these live-virus vaccines. If the initial rubella test shows that you are rubella non-immune, then you will be given the vaccine after delivery.

- **Varicella** - This vaccine, used to prevent chicken pox, should be given at least one month before pregnancy.

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Vaccination and pregnancy (3)

Which vaccines are usually not recommended for pregnant women, but may be considered when risks from exposure are high?

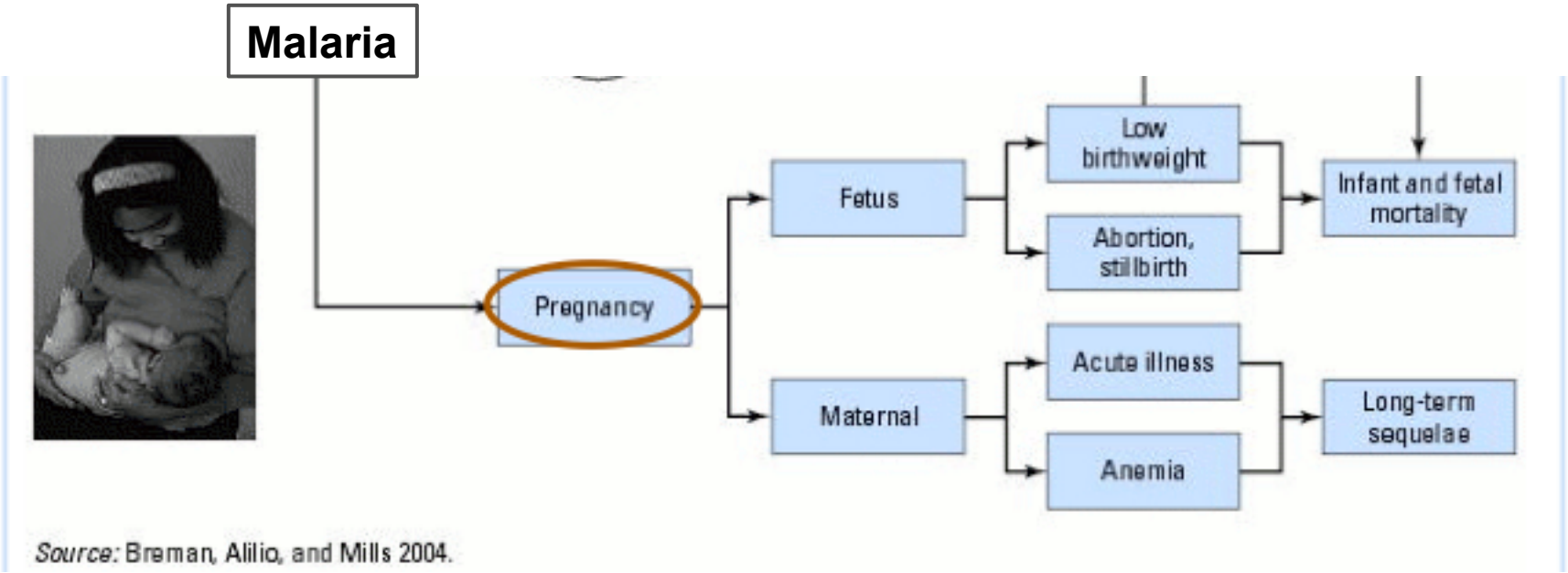
- **Hepatitis A -** The safety of this vaccine has not been determined.

- **Pneumococcal -** The safety of this vaccine is unknown,

- Oral Polio Vaccine (**OPV**) & Inactivated Polio Vaccine (**IPV**) - Neither the live-virus (OPV) nor the inactivated-virus (IPV) version of this vaccine is recommended for pregnant women

Malaria during Pregnancy

Pregnant women are particularly vulnerable to malaria as pregnancy reduces a woman's immunity to malaria, making her more susceptible to malaria infection and increasing the risk of illness, severe anaemia and death. For the unborn child, maternal malaria increases the risk of spontaneous abortion, stillbirth, premature delivery and low birth weight - a leading cause of child mortality.



Source: Breman, Alilio, and Mills 2004.

Malaria prevention during Pregnancy (1)

Based on available evidence, WHO recommends a three-pronged approach to the prevention and management of malaria during pregnancy:

1. **Insecticide-treated nets (ITNs)**

   ↓ 23% low-birth weight

   ↓ 33% abortions and perinatal mortality

Malaria prevention during Pregnancy (2)

2. Intermittent preventive treatment

-The WHO suggest two-three IPT during the second and third trimesters (with a minimal interval of 35 days among drug administration)

- 33 African countries introduced IPT

- The drug used is the sulphametoxazine-Pyrimethamine (SP) (3 tab once), but alternatives are under study

3. Effective case management of malarial illness.

Malaria treatment in pregnant women (1)

Pregnant women with symptomatic acute malaria are a high-risk group, and they must **promptly receive effective antimalarial treatment**.

In high-transmission settings, despite the adverse effects on fetal growth, malaria is usually asymptomatic in pregnancy or associated with only mild, non-specific symptoms. There is insufficient information on the safety and efficacy of most antimalarials in pregnancy, particularly for exposure in the first trimester.

Malaria treatment in pregnant women (2)

First trimester

Although data from prospective studies are limited, antimalarial medicines considered safe in the first trimester of pregnancy are:

- quinine,
- chloroquine,
- clindamycin.

Pregnant women in the first trimester with uncomplicated *falciparum* malaria should be treated with:

-**quinine** (10 mg salt/kg every 8 h) **+ clindamycin** (10 mg/kg twice a day) for seven days (and quinine monotherapy if clindamycin is not available).

- Artesunate plus clindamycin for seven days is indicated if this treatment fails.

Malaria treatment in pregnant women (3)

Second and third trimesters

There have been no adverse effects on the mother or fetus. The current assessment of benefits compared with potential risks suggests that the artemisinin derivatives (**ACT**) should be used to treat uncomplicated falciparum malaria in the second and third trimesters of pregnancy. The choice of combination partner is difficult because of limited information.

Malaria treatment in pregnant women (4)

Second and third trimesters

- Sulfadoxine-pyrimethamine (SP), though considered safe, is compromised for treatment in many areas because of increasing resistance.

- Quinine is associated with an increased risk of hypoglycaemia in late pregnancy, and it should be used only if effective alternatives are not available.

- Clindamycin is also considered safe, but it must be given for seven days in combination with quinine.

- Primaquine and tetracyclines should not be used in pregnancy

Malaria treatment in lactating women

Lactating women should receive standard antimalarial treatment (including ACTs) except for:

- dapsone,
- primaquine and
- tetracyclines,

which should be withheld during lactation

Looking for Female Genital Mutilation….

✓ Female genital mutilation (FGM) includes procedures that intentionally alter or injure female genital organs for non-medical reasons.

✓ The procedure has no health benefits for girls and women.

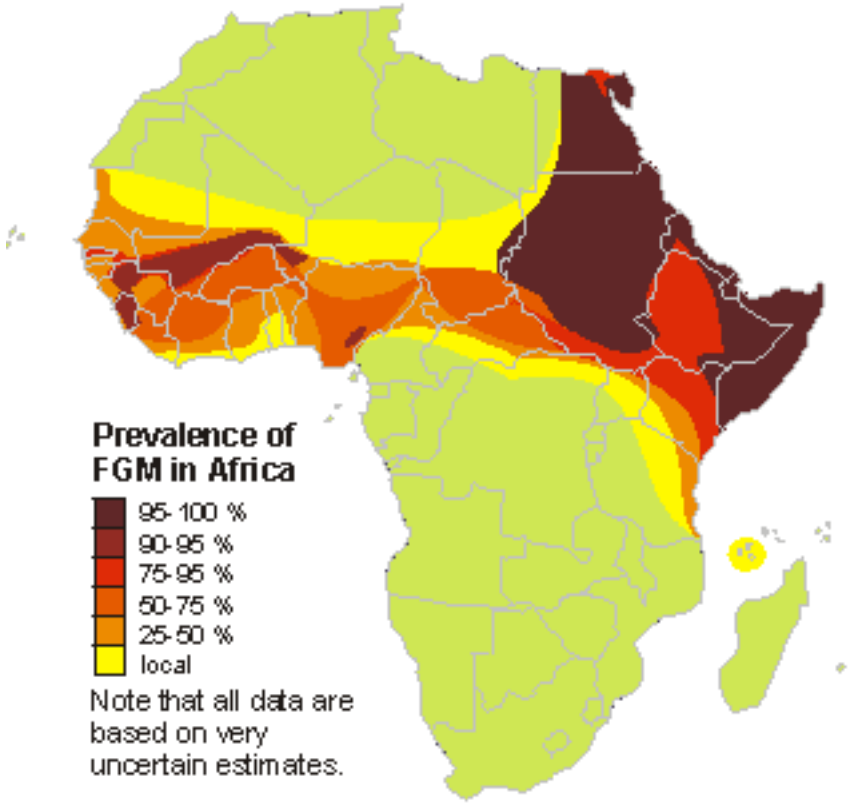
✓ Procedures can cause severe bleeding and problems urinating, and later, potential childbirth complications and newborn deaths.

✓ FGM is internationally recognized as a violation of the human rights of girls and women

Looking for Female Genital Mutilation….

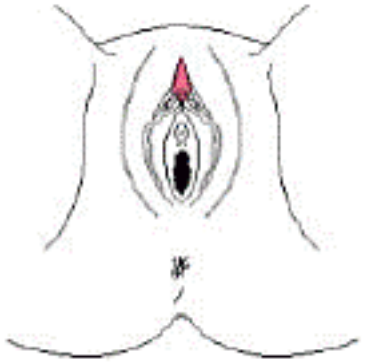
✓ An estimated 100 to 140 million girls and women worldwide are currently living with the consequences of FGM. It is mostly carried out on young girls sometime between infancy and age 15 years.

✓ **In Africa an estimated 92 million girls from 10 years of age and above have undergone FGM**.

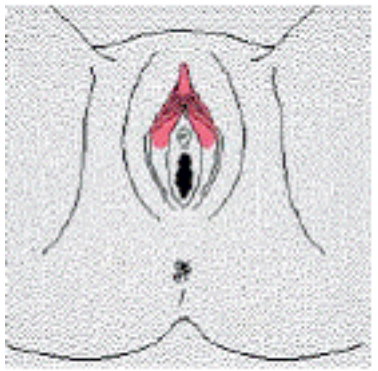


Female genital mutilation is classified into four major types.

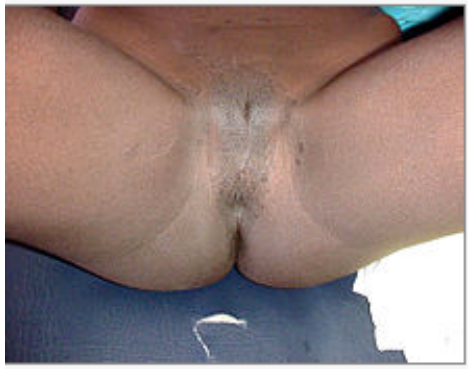
Clitoridectomy: partial or total removal of the clitoris (a small, sensitive and erectile part of the female genitals) and, in very rare cases, only the prepuce (the fold of skin surrounding the clitoris).

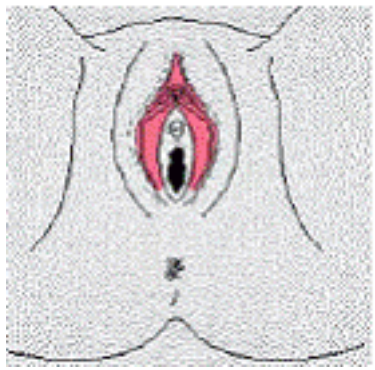


Excision: partial or total removal of the clitoris and the labia minora, with or without excision of the labia majora (the labia are "the lips" that surround the vagina).



Infibulation: narrowing of the vaginal opening through the creation of a covering seal. The seal is formed by cutting and repositioning the inner, or outer, labia, with or without removal of the clitoris.





FGM has no health benefits, and it harms girls and women in many ways. It involves removing and damaging healthy and normal female genital tissue, and interferes with the natural functions of girls' and women's bodies.

Immediate complications can include:
- severe pain,
- shock,
- haemorrhage (bleeding),
- tetanus or sepsis (bacterial infection),
- urine retention,
- pen sores in the genital region and
- injury to nearby genital tissue

Long-term consequences can include:
- recurrent bladder and urinary tract infections;
- cysts;
- infertility;
- an increased risk of childbirth complications and newborn deaths;
- the need for later surgeries

Basic nutritional aspects during pregnancy

During pregnancy it is important to follow a dietary regimen that includ variety of food as:

✓ abundant quantity of fruits and vegetables
(source of fibers and vitamins)

✓ Farinaceous as bread, pasta, rice, potatoes
(source of carbohydrates)

✓ fish, meat, legumes
(source of proteins).

Nutritional needs during pregnancy

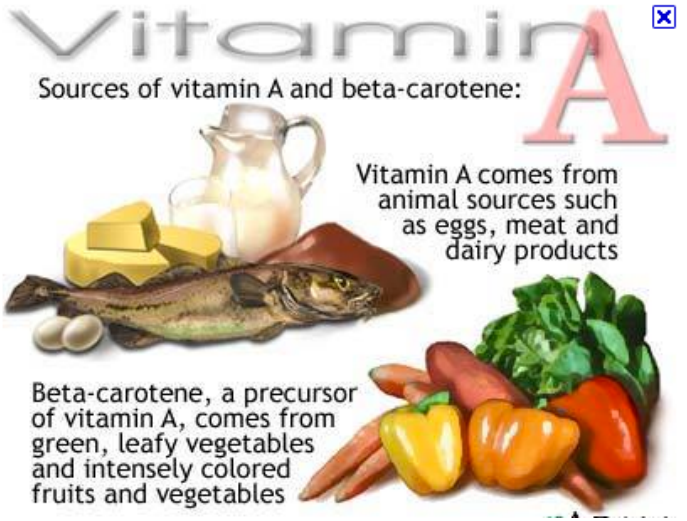
Woman of 56 kg of weight with median activity	Outside the pregnancy	During pregnancy	During breast-feeding
Calories	2 000 à 2 400	2 500	3 000
Protides (g)	60	85	100
Glucides (g)	300 à 400	350 à 400	450 à 500
Lipides (g)	40 à 70	55 à 80	70 à 80
Ca (g)	1,0	1,5	2,0
P (g)	1,3	2	2,5
Fer (mg)	12	30	30
Cu (mg)	1 à 1,5	1,5 à 2	1,5 à 2
I (gamma)	20	20 à 200	20 à 200
NaCl (g)	10 à 15	5 à 10	10 à 15
K (g)	1	1	
Mg (g)	0,4	0,4	
Vitamines :			
A (UI)	5 000	6 000	8 000
B_1 (mg)	1,2	1,5	1,5
B_2 (mg)	1,5	2,5	3
B_6 (mg)	2	4	
PP (mg)	12	15	15
C (mg)	70	100	150
D (UI)		400	400

Vitamin A

High-dose vitamin A should be avoided during pregnancy because of the theoretical risk of teratogenisis (birth defects).

During pregnancy it is important to eat regularly food containing Vitamin A.

An eventual supplementation of Vitamin A is indicated only in symptomatic deficiency (night blindness).



From a programmatic perspective, high-dose vitamin A (200,000 IU) supplementation must occur during the safe infertile period immediately after delivery.

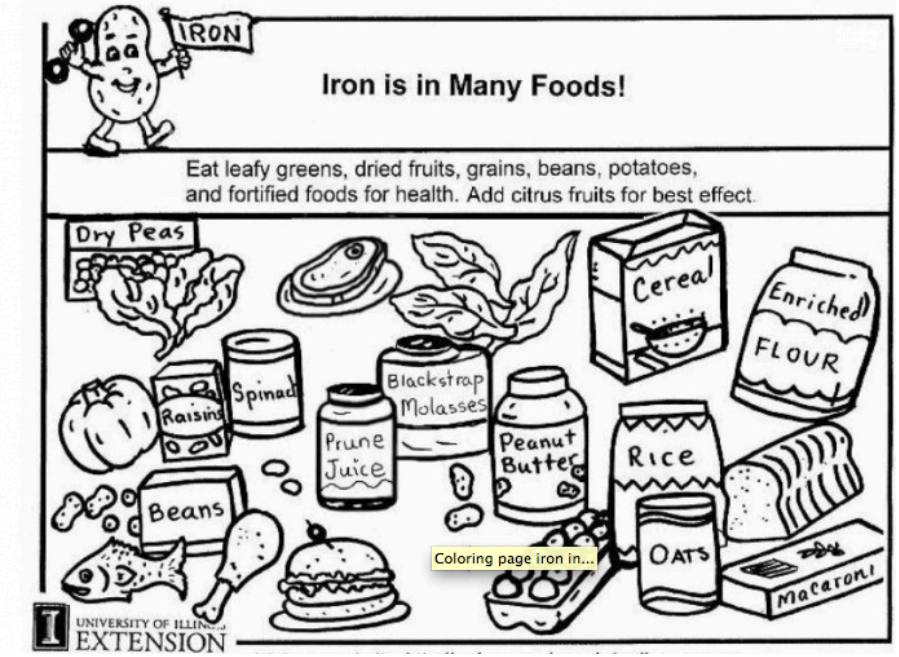
Accordingly, high-dose vitamin A supplementation can be provided safely to all postpartum mothers within six weeks of delivery, when the chance of pregnancy is remote. For breastfeeding mothers, the safe infertile period extends up to eight weeks after delivery.

Folic Acid

The protective role of folic acid supplementation during pregnancy against congenital newborn's defects is well documented.

All pregnant women (or women planning a pregnancy) have to take at least 0.4 mg of folic acid every day (especially in the first trimester of pregnancy).

Iron supplementation is not indicated for all pregnant women, but only for those that are really anaemic (HGB < 11 g/dl in the first trimester or < 10.5 g/dl in the third trimester) and don't have a food regimen with iron-reach foods.



General advices for food consummation during pregnancy

- Wash with clean water fruits and vegetables before manipulation and consommation

- Wash the hands regularly before and after eating

- Cook well all animal-food, especially chicken, swine, eggs

- Protect the food against insect contamination

- Avoid the consommation of food prepared by person with diarrhoea

- Avoid mucosal contact with raw meat

“Physiological” symptoms during pregnancy

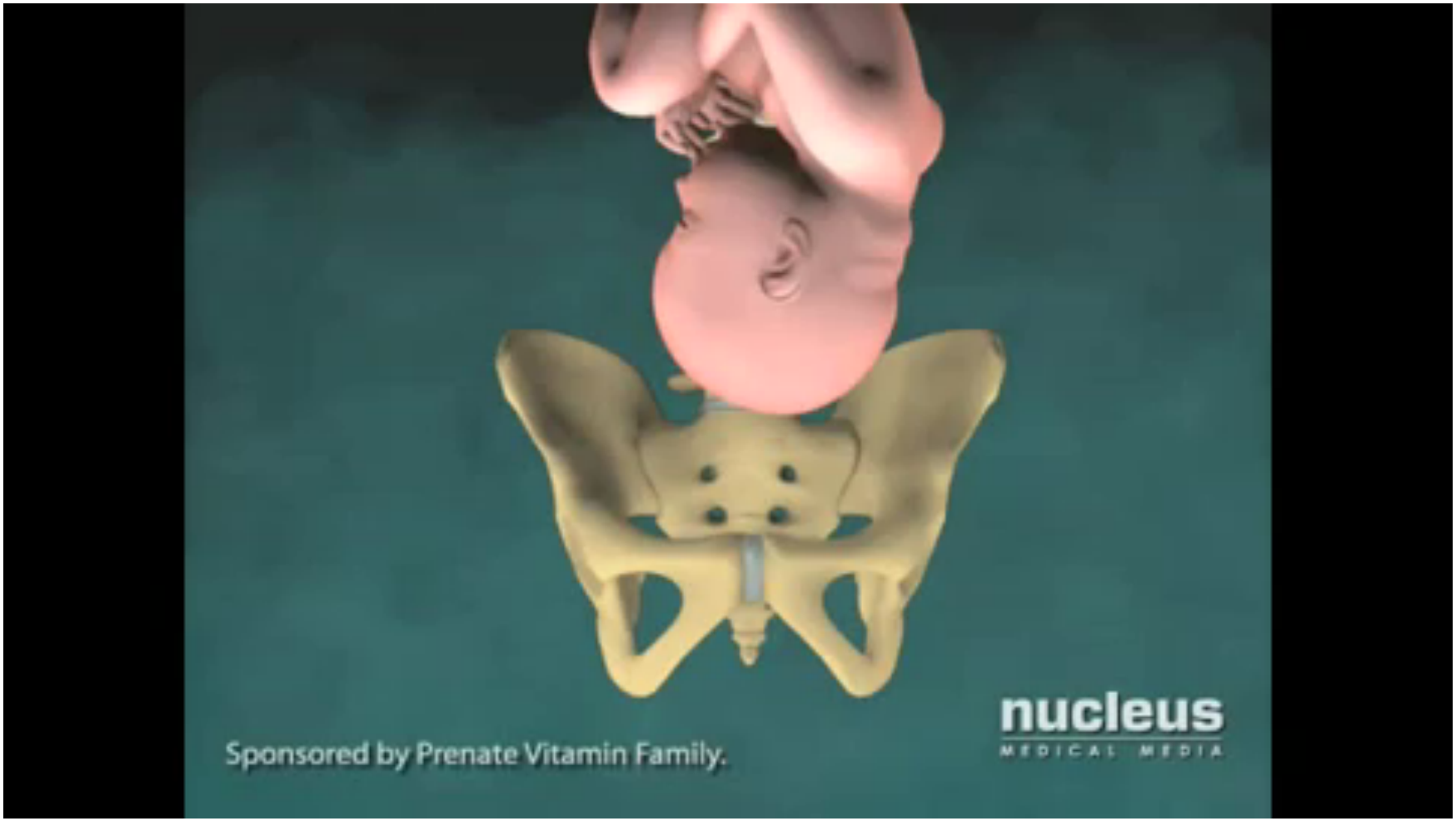
Nausea and vomiting can be present during the first period of the pregnancy, for disappearing before 16^{th}-20^{th} week of pregnancy

An increase of **vaginal discharge** is a physiological change during pregnancy. The appearance of genital itch, pain, bad odour or difficult urination can be secondary to an infection that must be investigated by the health staff

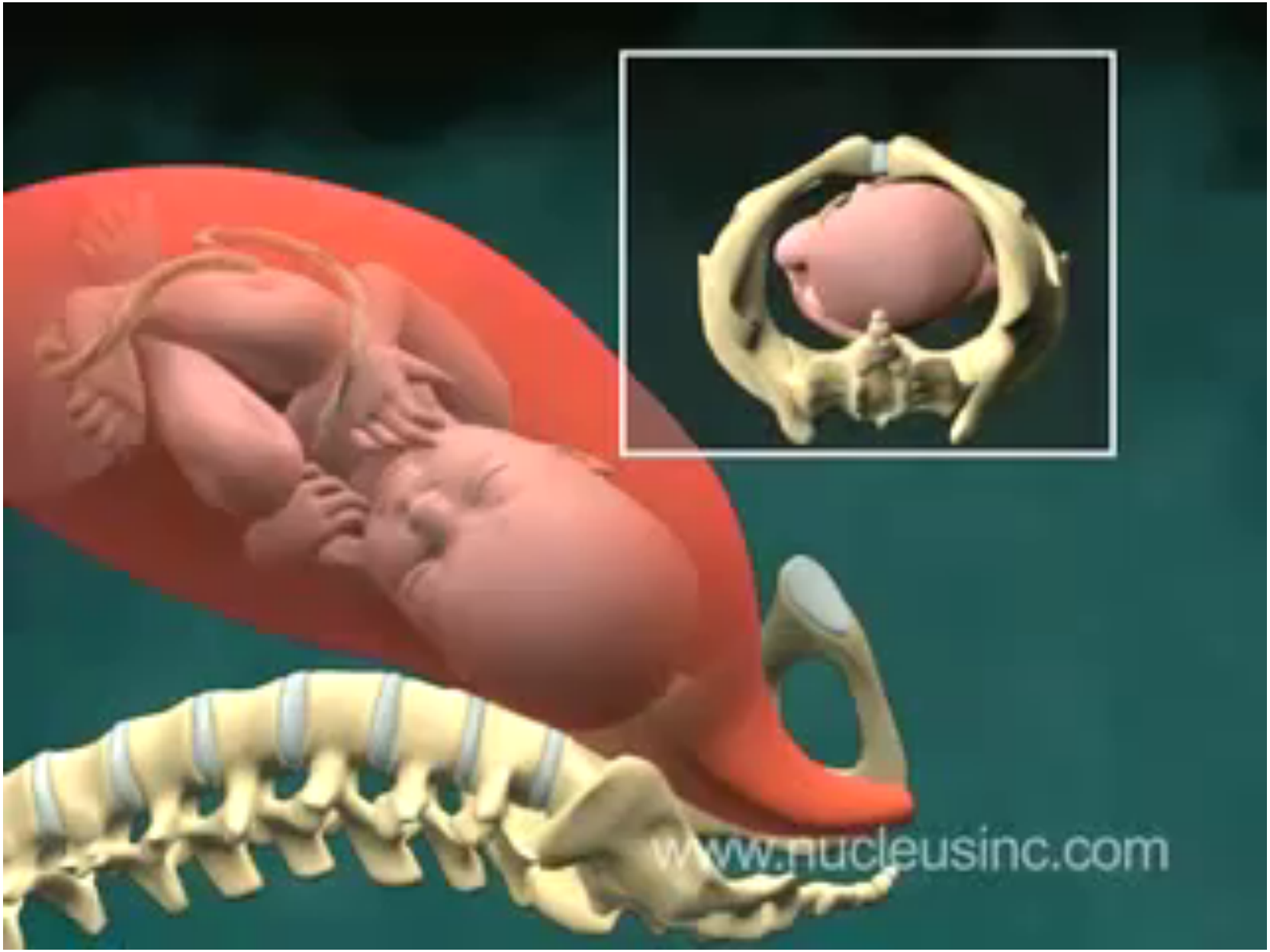
Lumbar pain, especially during the third trimester of pregnancy, is a frequent symptom and depend from the baby increased weight and size.

The delivery

The newborn presentation (pelvic engagement)



Newborn’s Expulsion



Afterbirth

Natural deliverance of placenta

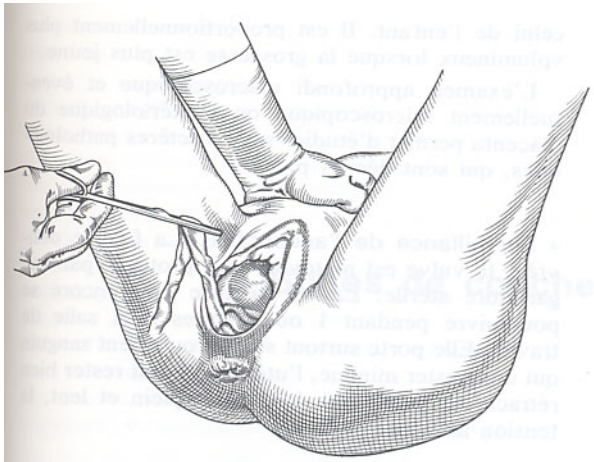


FIG. 180. — *Technique de la délivrance naturelle : premier temps.*

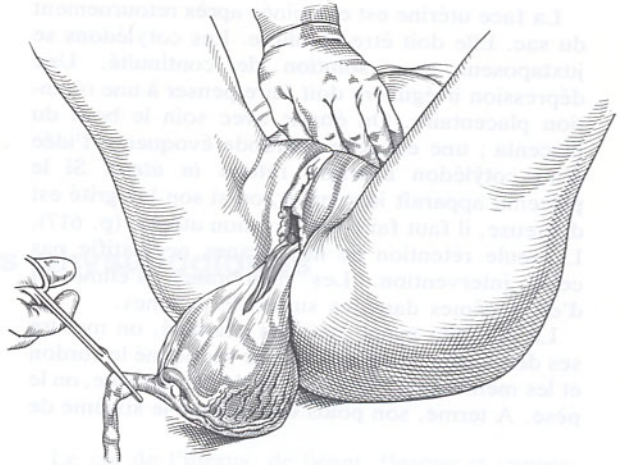


FIG. 181. — *Technique de la délivrance naturelle : deuxième temps.*

If the placenta is not expelled spontaneously, clinicians may offer 10 IU of oxytocin in combination with controlled cord traction.

Manual deliverance of placenta

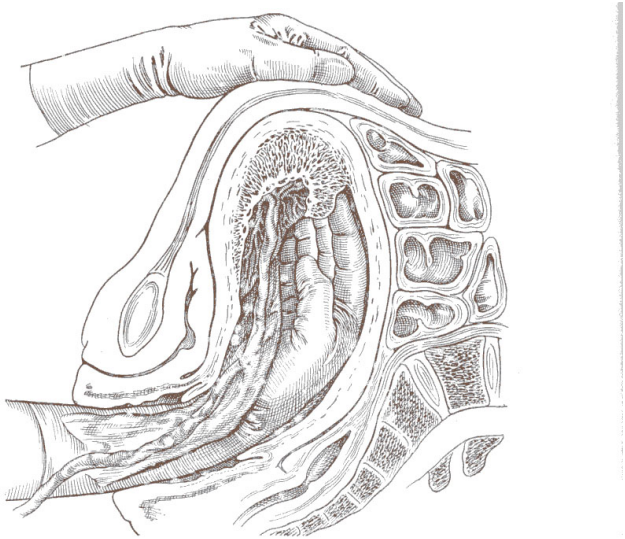


FIG. 528. — *Délivrance artificielle. La main intra-utérine clive l'espace inter-utéro-placentaire alors que la main abdominale maintient le fond utérin.*

A single dose of antibiotics (ampicillin) should be offered after manual removal of the placenta

Afterbirth

- **After placenta expulsion** administer Methergin (Methylergonovine maleate) to the mother for reducing post-partum bleeding. The drug acts directly on the smooth muscle of the uterus and increases the tone, rate, and amplitude of rhythmic contractions (induction of a rapid and sustained tetanic uterotonic effect which reduces blood loss). Administration by i.m. (1 vial repeatable after 2-4 hours) and os (1 tab x 3-4 times/day for 7 days)

After childbirth, blood loss and other clinical parameters should be closely monitored.

Care for post-partum haemoprrage and retained placenta

Uterine atony:
uterus soft and relaxed

Treat for uterine atony

- Uterine massage
- Uterotonic drugs:
  - Oxytocin
  - Ergometrine
  - Prostaglandins
    - Misoprostol
    - Prostaglandin F2α

If bleeding continues

- Nonsurgical uterine compression:
  - Bimanual uterine compression
  - Balloon or condom tamponade
- Tranexamic acid

If bleeding continues

- Compression sutures
- Artery ligation (uterine, hypogastric)
- Uterine artery embolization

Surgery

If bleeding continues

- Hysterectomy
- If intra-abdominal bleeding occurs after hysterectomy, consider abdominal packing

Surgery

Placenta not delivered

Treat for whole retained placenta

- Oxytocin
- Controlled cord traction
- Intraumbilical vein injection (if no bleeding)

If whole placenta still retained

- Manual removal with prophylactic antibiotics

Placenta delivered incomplete

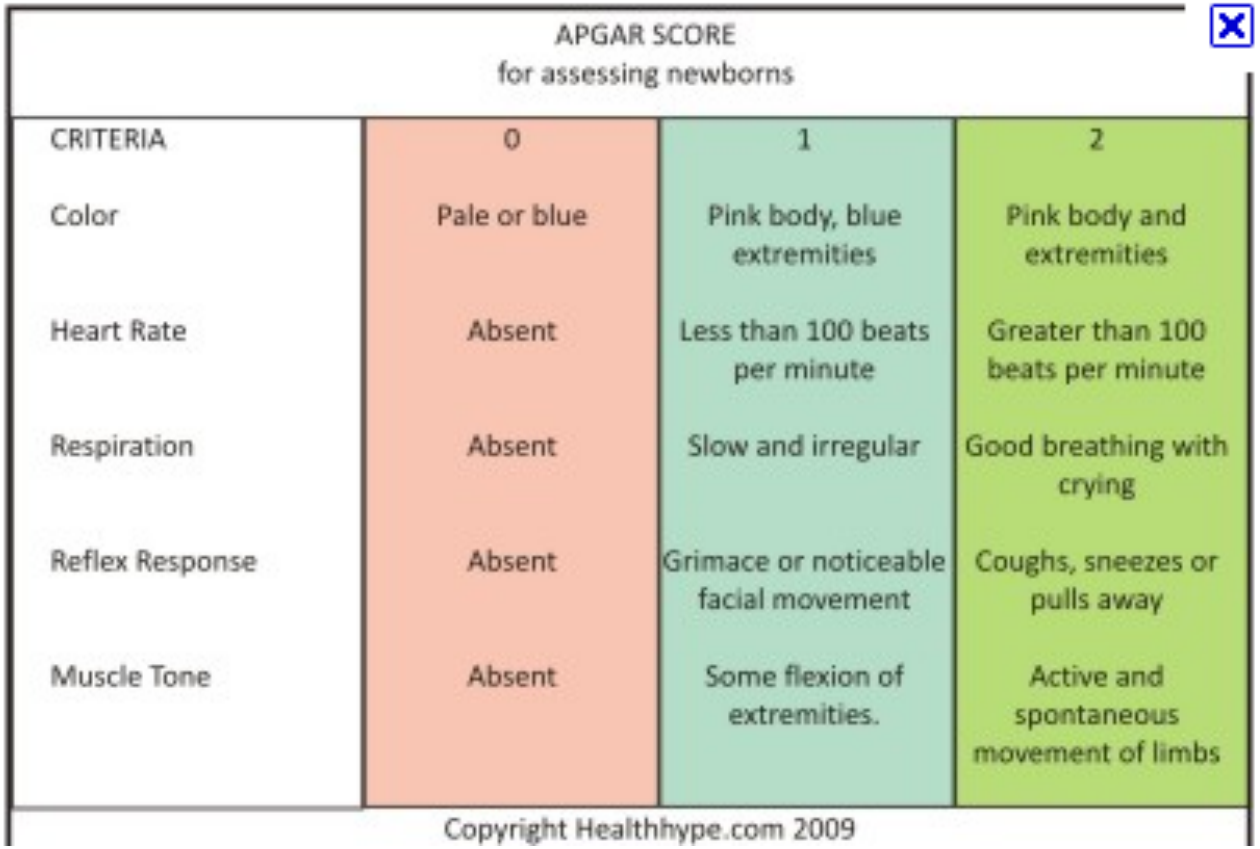
Treat for retained placenta fragments

- Oxytocin
- Manual exploration to remove fragments
- Gentle curettage or aspiration

If bleeding continues

- Manage as uterine atony

Check the newborn after 3 and 5 minutes for APGAR score



APGAR SCORE
for assessing newborns

CRITERIA	0	1	2
Color	Pale or blue	Pink body, blue extremities	Pink body and extremities
Heart Rate	Absent	Less than 100 beats per minute	Greater than 100 beats per minute
Respiration	Absent	Slow and irregular	Good breathing with crying
Reflex Response	Absent	Grimace or noticeable facial movement	Coughs, sneezes or pulls away
Muscle Tone	Absent	Some flexion of extremities.	Active and spontaneous movement of limbs

- Clean the newborn form the caseous secretion covering the body

- Administer tetracycline ophthalmic 1% ointment or Erythromycin 0.5% ointment to the newborn (prevention of ocular gonorrhoea)

- Give the newborn to the mother for starting breastfeeding (if not contraindicated)