



RAMA UNIVERSITY

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UNIT -2, AMNIOTIC FLUID

FACULTY OF NURSING

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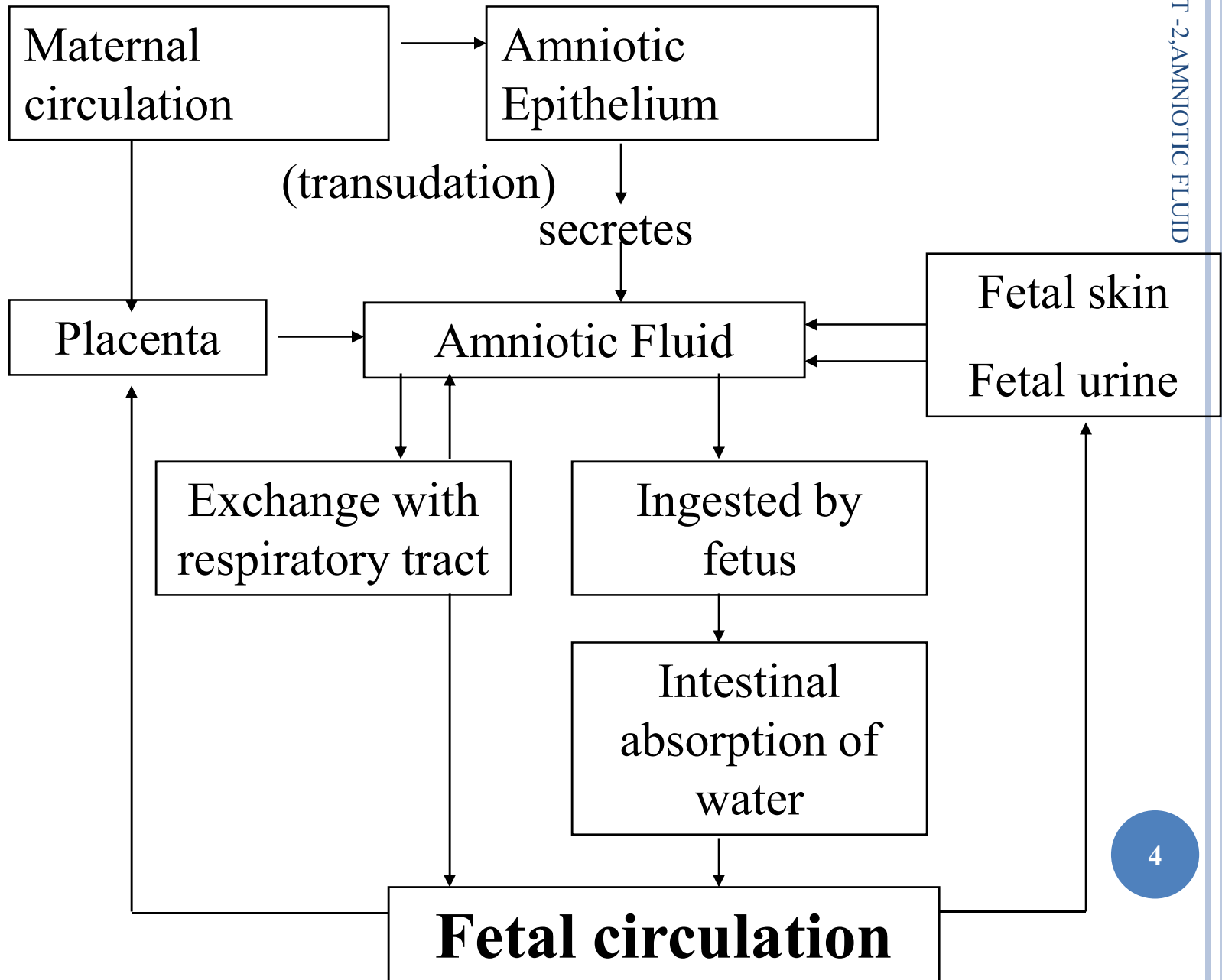
AMNIOTIC FLUID

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Amniotic fluid is the clear, yellowish fluid that surrounds and protects the fetus in the uterus

ORIGIN



- Fetal daily urine output at term is about 400 to 1200ml.
- Fetus swallows around 200-500ml of liquor every day at term.
- Fetal kidneys start producing urine at 12 weeks and by 18 weeks they are producing 7 to 14ml per day.
- Fetal urine contains more urea, creatinine and uric acid than fetal plasma. It also contains desquamated fetal cells, vernix, lanugo and various secretions

VOLUME

- **It measures**
 - 50 ml - 12 weeks
 - 400 ml - 20 weeks
 - 1000 ml - 36-38weeks
- **Then it decreases to**
 - 600- 800 ml at 40 weeks
 - 200 ml at 43 weeks

PHYSICAL FEATURES

- **Amniotic fluid** – faintly alkaline has low specific gravity of 0.010.
- Osmolarity of 250m Osmol/lit. S/O fetal maturity.
- **Colour** : Normally in early pregnancy – colourless
- Near term - Pale straw colour due to presence of exfoliated lanugo and epidermal cells from the skin.

. **Abnormal colours** : has its own clinical importance.

1. **Meconium stained (Green)**

S/O fetal distress in presentation other than Breech or transverse

- It can be –Thin, Thick, Pea souped (Thick with flakes)
(Chronic fetal distress)

2. Golden colour : In RH incompatibility (due to excessive haemolysis of fetal RBCs and produce of excess bilirubin.

3. Greenish Yellow (Saffron): Post maturity

4. Dark colored in concealed accidental hemorrhage (due to contamination of blood)

5. Dark brown (Tabacco juice): In I. V. D due to frequent presence of old HbA.

COMPOSITION

- **First half of pregnancy composition is** – Transudate of plasma.
- **Late pregnancy composition** is very much altered mainly due to contamination of fetal urinary metabolite. It includes water and solid.
 - Water (98-99%)
 - Solid (1-2%) 1.Organic 2. Inorganic
- **Organic :**

Protein-0.3gm %	Urea- 30mg%
Glucose – 20mg%	NPN- 30mg%
Uric acid- 4mg%	Creatinine-2mg%
Total lipids 50 mg%	Hormones (prolactine, insulin, and renin)

- **Inorganic**

- Sodium

- Chloride

} Slight fall as pregnancy advances

- Potassium - Remains unaltered

- **Suspended particles** :- It includes lanugo, exfoliated squamous epithelial cells from fetal skin, vernix caseosa, cast of amniotic cells and cells from respiratory tract, urinary bladder and vagina of fetus.

AMNIOTIC FLUID VOLUME MEASUREMENT

CLINICALLY

- By palpation if AFV is more than normal uterine size is more than period of amenorrhoea.
- If AFV is less than normal uterine size is less than period of amenorrhoea.

USG: It is the most reliable technique for estimation of AFV

- The four quadrant technique consist of measuring the vertical diameter of largest pocket of fluid found in each of the four quadrants of uterus: the sum of the result is the AFI.
- < 5 cm – Oligohydramnios
- 5-10- decrease AFV
- 10-15 - normal
- 15-20 - increase AFV.
- > 25 cm. polyhydramnios

AFI

- **Objective assessment depends on U/S to measure:**
 - **deepest vertical pool (DVP).**
 - **Amniotic fluid index (AFI). It is a total of the DVPs in each four quadrants of the uterus. it is a more sensitive indicator of AFV throughout pregnancy.**

FUNCTIONS

Main function is protective to fetus

DRURING PREGNANCY:

- ❑ Shock absorber (Protect the fetus from extraneous injury)
- ❑ Maintains temperature
- ❑ Distends the amniotic sac – thereby allows the growth and free movement of fetus and prevent adhesions between fetal part and amniotic sec.
- ❑ Negligible nutritive value Allow room for fetal growth, movement and development.
- ❑ Protects the fetus from trauma.
- ❑ Contains antibacterial activity.

DURING LABOUR

- Amnion + chorion combined to form a hydrostatic wedge which helps in dilatation of cervix.
- During uterine contraction it prevents marked interference with placental circulation so long as the membranes remains intact. .
- It flushes the birth canal at the end of first stage of labour and by its aseptic and bactericidal action protects the fetus and prevents ascending infections to uterine cavity

CLINICAL IMPORTANCE

Clinically also amniotic fluid is very important as

- 1) Study of amniotic fluid provides useful information about the well being and also maturity of fetus.
- 2) Intramniotic instillation of chemicals is used as a method of induction of abortion.
- 3) Excess or less amniotic fluid can diagnose the clinical conditions of polyhydramnios or oligohydrominos respectively
- 4) Rupture of membranes with drainage of liquor is helpful method in induction of labour.

Amniotic fluid as a diagnostic tool

Umbilical cord



THE UMBILICAL CORD

- The umbilical cord of funis the connecting link between the fetus and placenta.
- Through which the fetal blood flows to and from the placenta it extend from the fetal umbilical and to the fetus surface of the placenta.
- 40 cm long



PHOTO: ISTOCKPHOTO.COM/KENNETH C. ZIRKEL

STRUCTURE OF UMBILICAL CORD

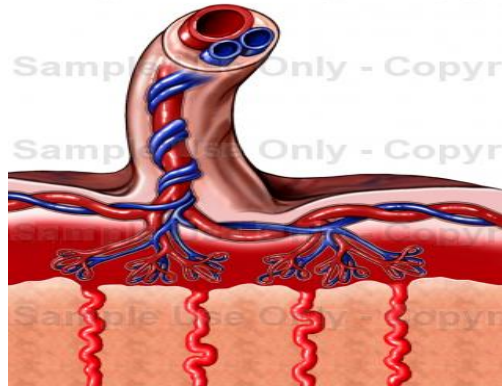
1. **Covering epithelium** : It is lined by a single layer of amniotic epithelium.
2. **Wharton's jelly**: Consist of enangatal cells in a gelatinous fluid rich in mucopalysachride & has got protective function to the umbiblical vessel.
3. Blood vessel & two umbilical arteries spiralling around single umbilical vein in the middle umbilical vein is larger than umbilical artery initially there are 4 blood vessels eg. 2 arteries' & 2 vein of the two umbilical vein the right one disappears by 4th month leaving behind one vein.

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FUNCTION OF UMBILICAL CORD

- line between placenta and to fetus supply oxygen and nutrients to fetus and disposing waste products.
- Exchange of fluid and electrolyte between umbilical vessels and amniotic fluid.
- It is the source of connection from placenta to the fetus
- Connection to the fetal circulation

- **Abnormalities of umbilical cord**
- **Short cord:-** The short cord may be true (less than 20 cm or 8 cm) or commonly relative due to entanglement of the cord round any fetal part. In exceptional circumstances the cord may be absent and the placenta may be attached to the liver as in exomlhalos
- **Long cord:-** its length may be 50 to 70 inches it may wound once, twice or thrice round the neck or to the body of the foetus, long cord may prolapse during labour

THANK YOU.....

