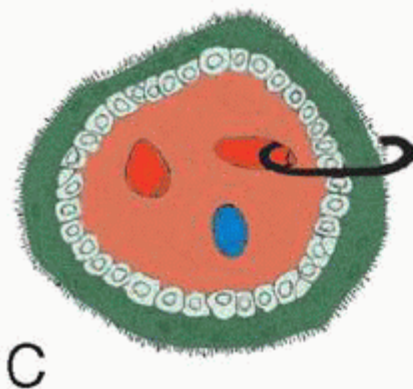
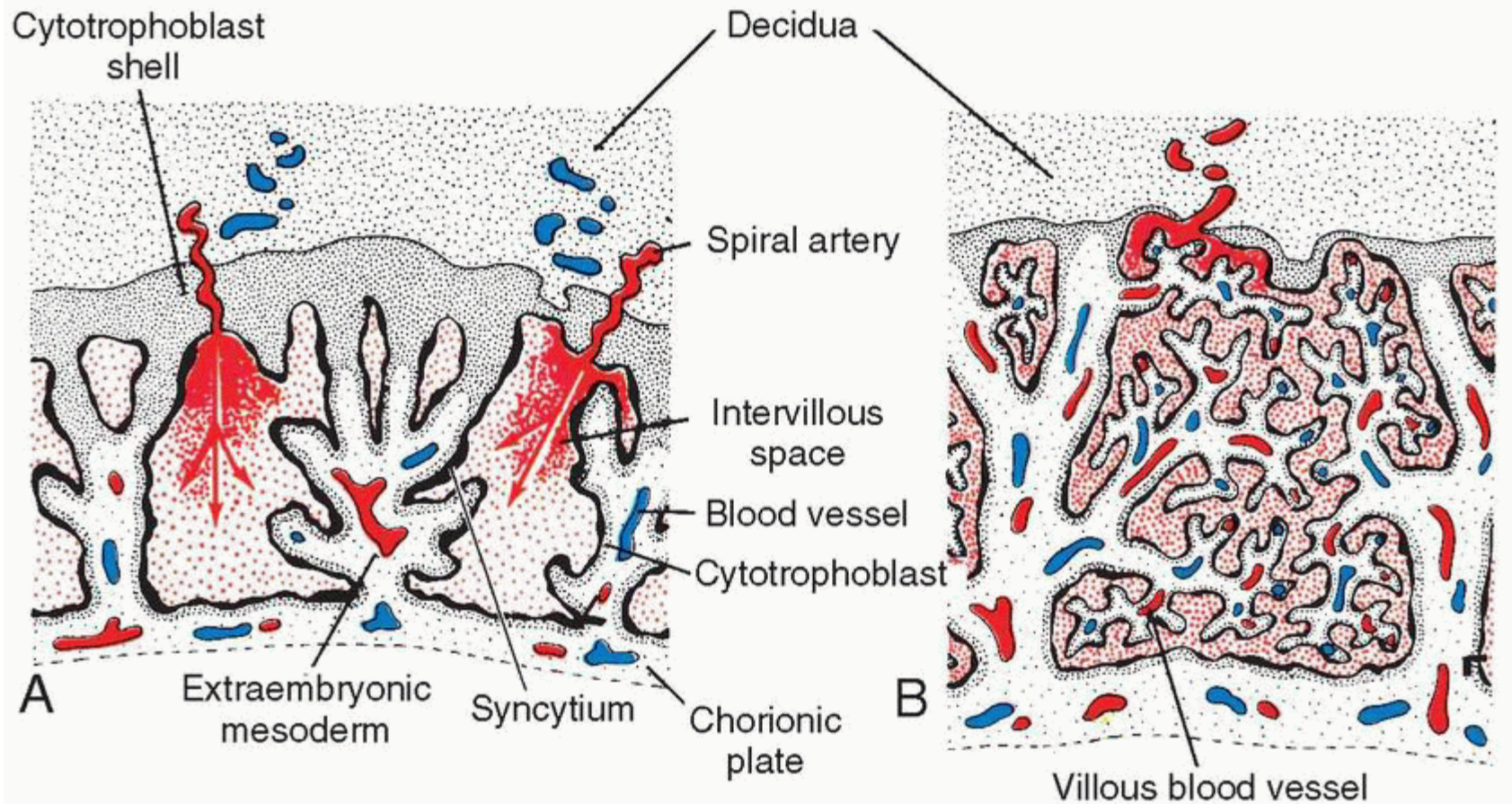
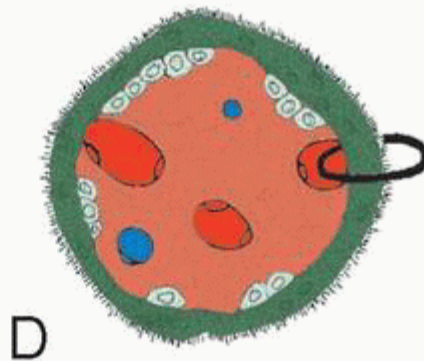


بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



- Barrier formed by
1. Syncytium
  2. Cytotrophoblast
  3. Connective tissue
  4. Endothelium



- Barrier formed by
1. Syncytium
  2. Endothelium

## STRUCTURE OF THE PLACENTA(4m)

The placenta has two components:

(1) Fetal portion, formed by the chorion frondosum

(2) Maternal portion, formed by the decidua basalis .

On the fetal side, the placenta is bordered by the chorionic plate;

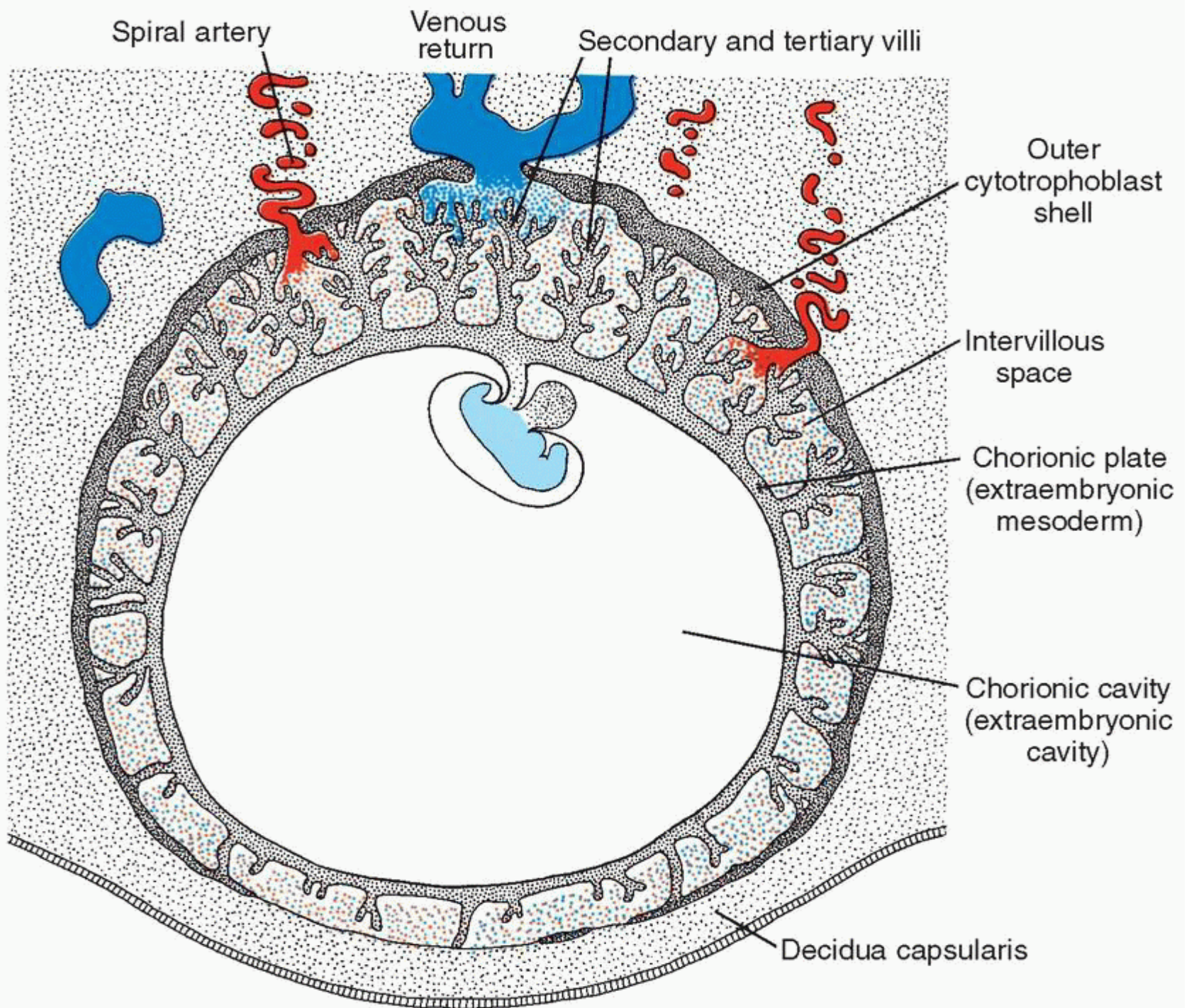
Maternal side, it is bordered by the decidua basalis, of which the decidual plate is most intimately **INCORPORATED** into the placenta.

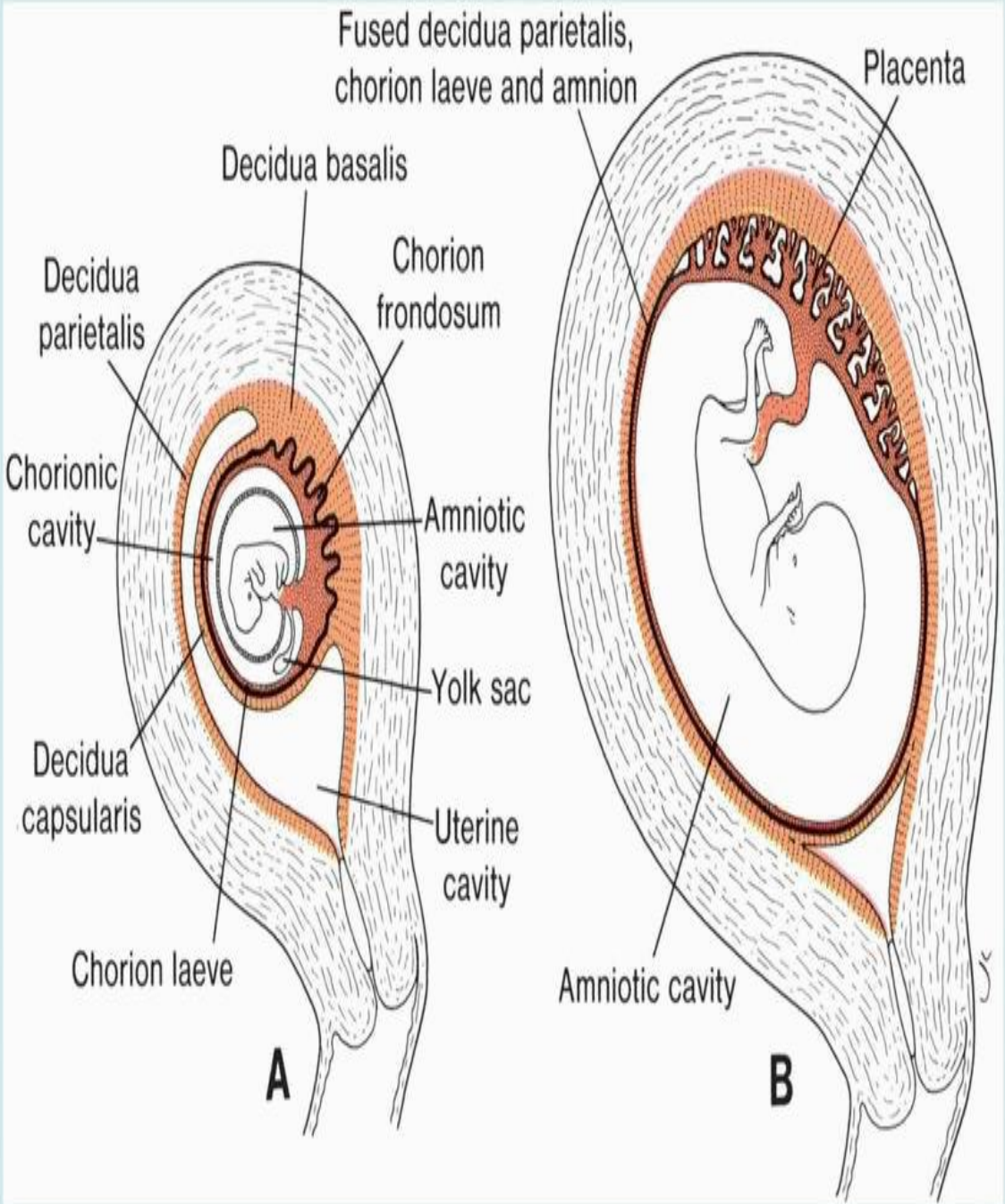
Between the chorionic and decidual plates are the intervillous spaces, which are filled with maternal blood.

They are lined with syncytium of fetal origin.

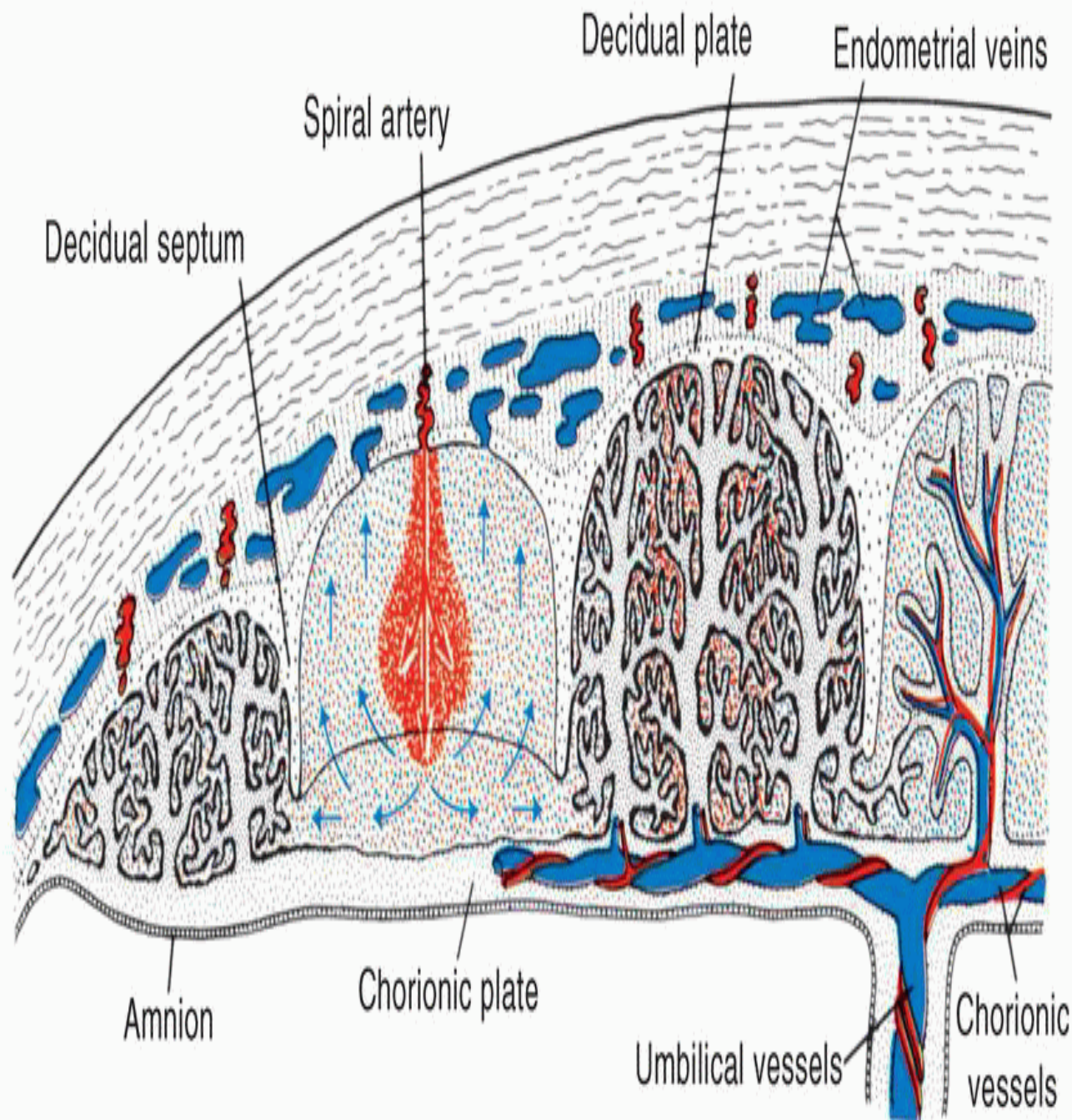
The villous trees grow into the intervillous blood lakes.

During the fourth and fifth months, the decidua forms a number of decidual septa, which project into intervillous spaces but do not reach the chorionic plate . As a result of this septum formation, the placenta is divided into a number of compartments, or cotyledons .



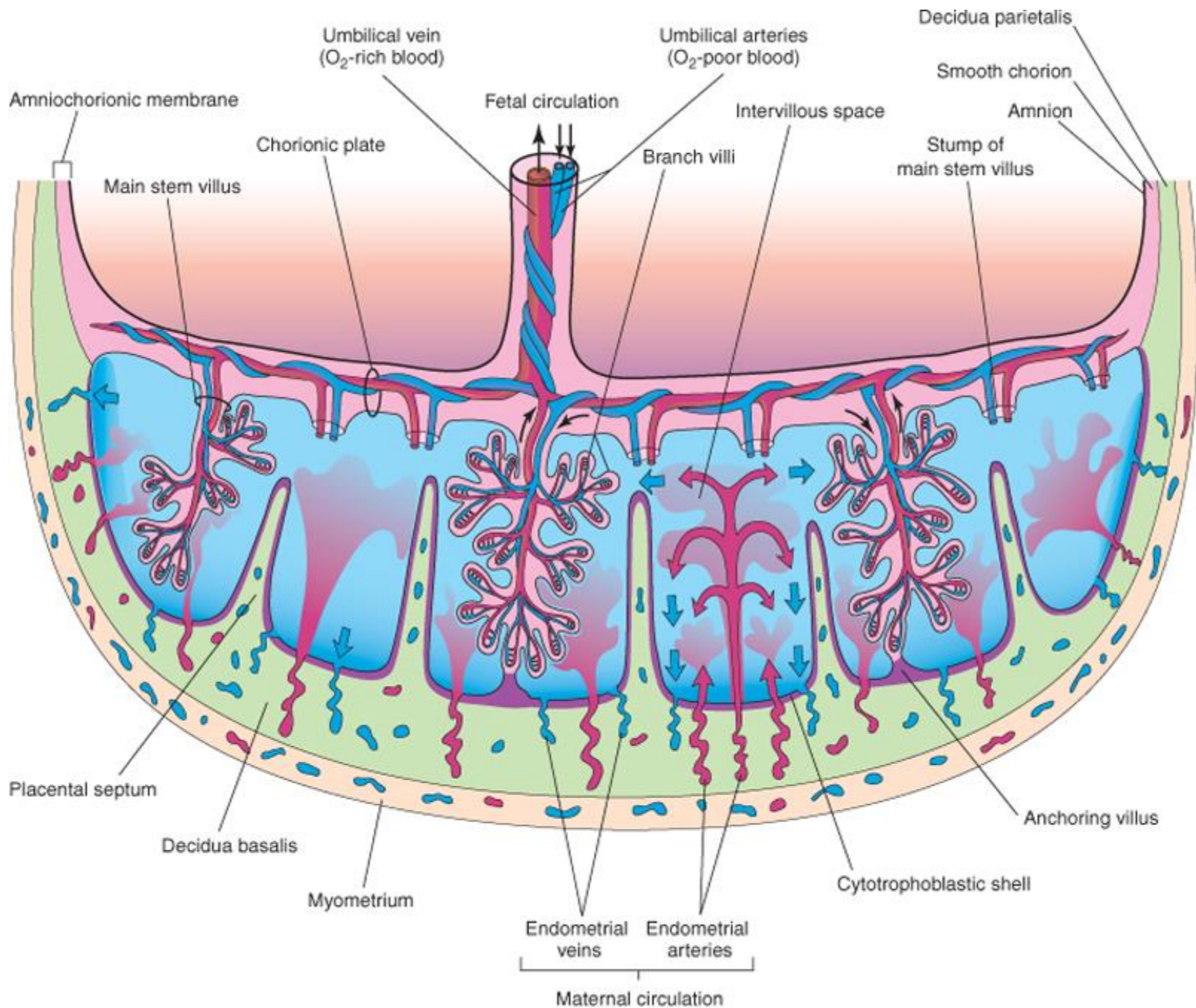


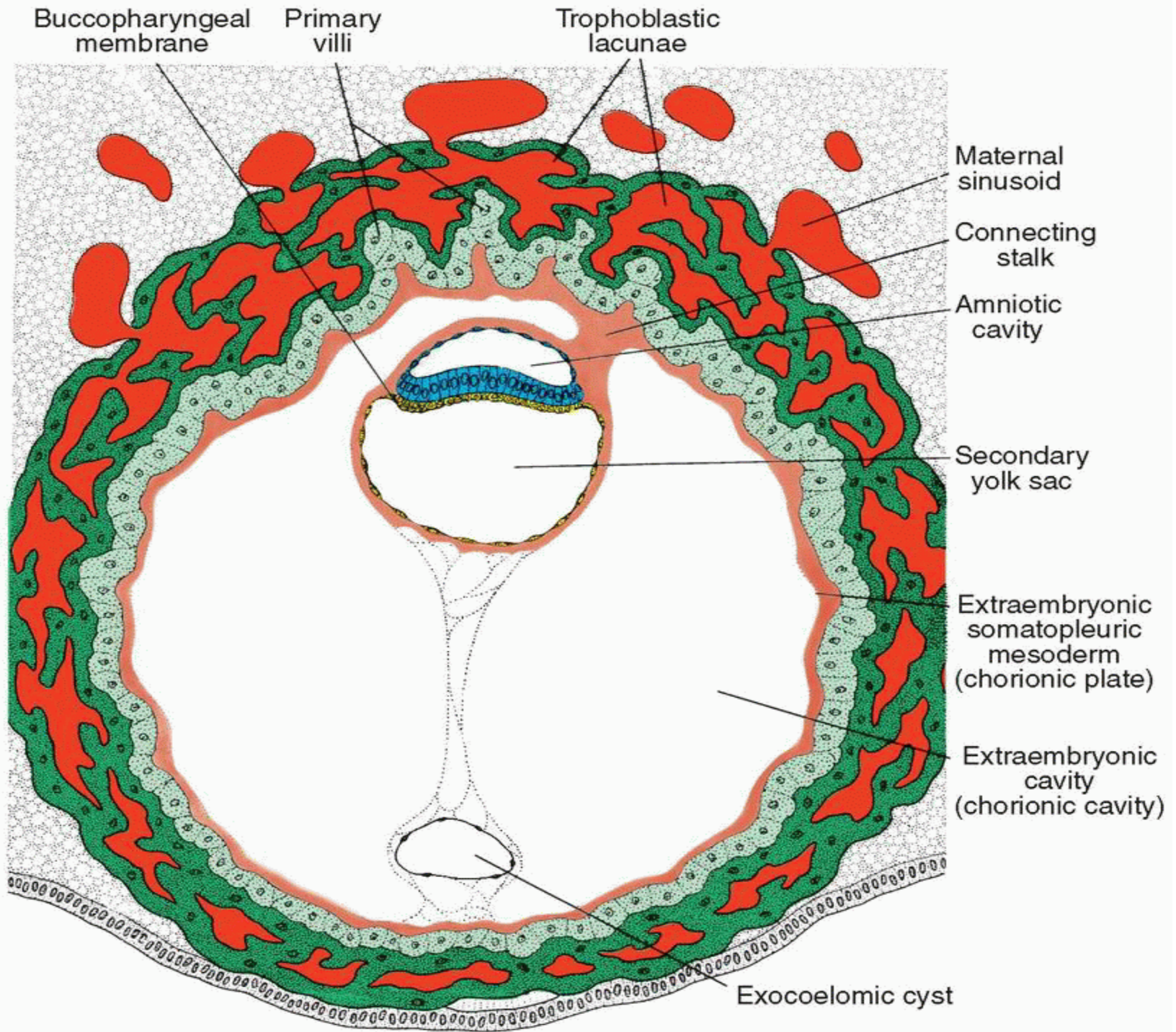
Relation of fetal membranes to wall of the uterus. A. End of the second month. Note the yolk sac in the chorionic cavity between the amnion and chorion. At the abembryonic pole, villi have disappeared (chorion laeve). B. End of the third month. The amnion and chorion have fused, and the uterine cavity is obliterated by fusion of the chorion laeve and the decidua parietalis.

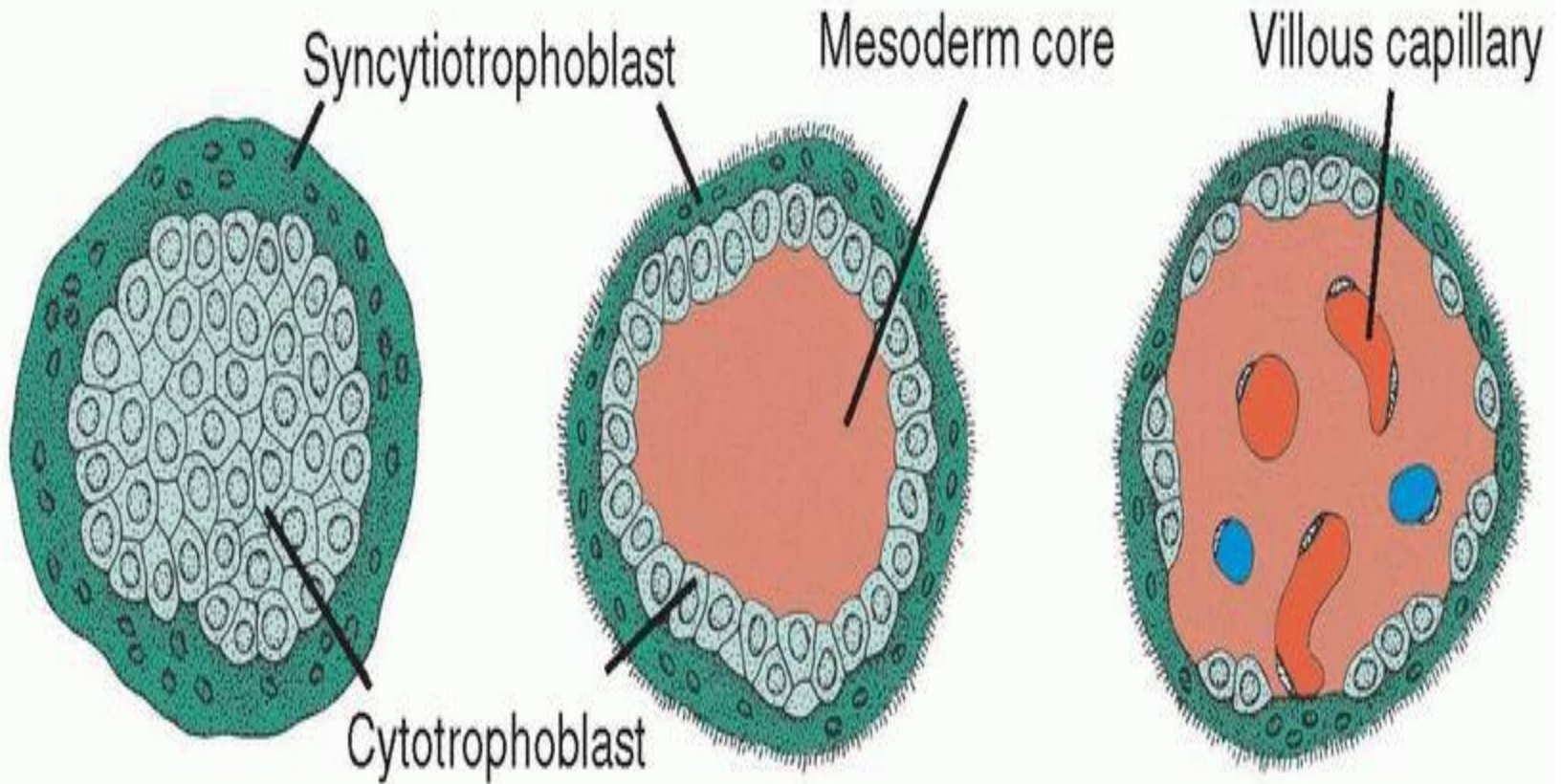


**The placenta in the second half of pregnancy. The cotyledons are partially separated by the decidual (maternal) septa. Most of the intervillous blood returns to the maternal circulation by way of the endometrial veins. A small portion enters neighboring cotyledons. The intervillous spaces are lined by syncytium.**





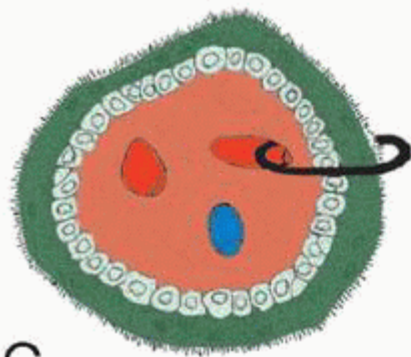
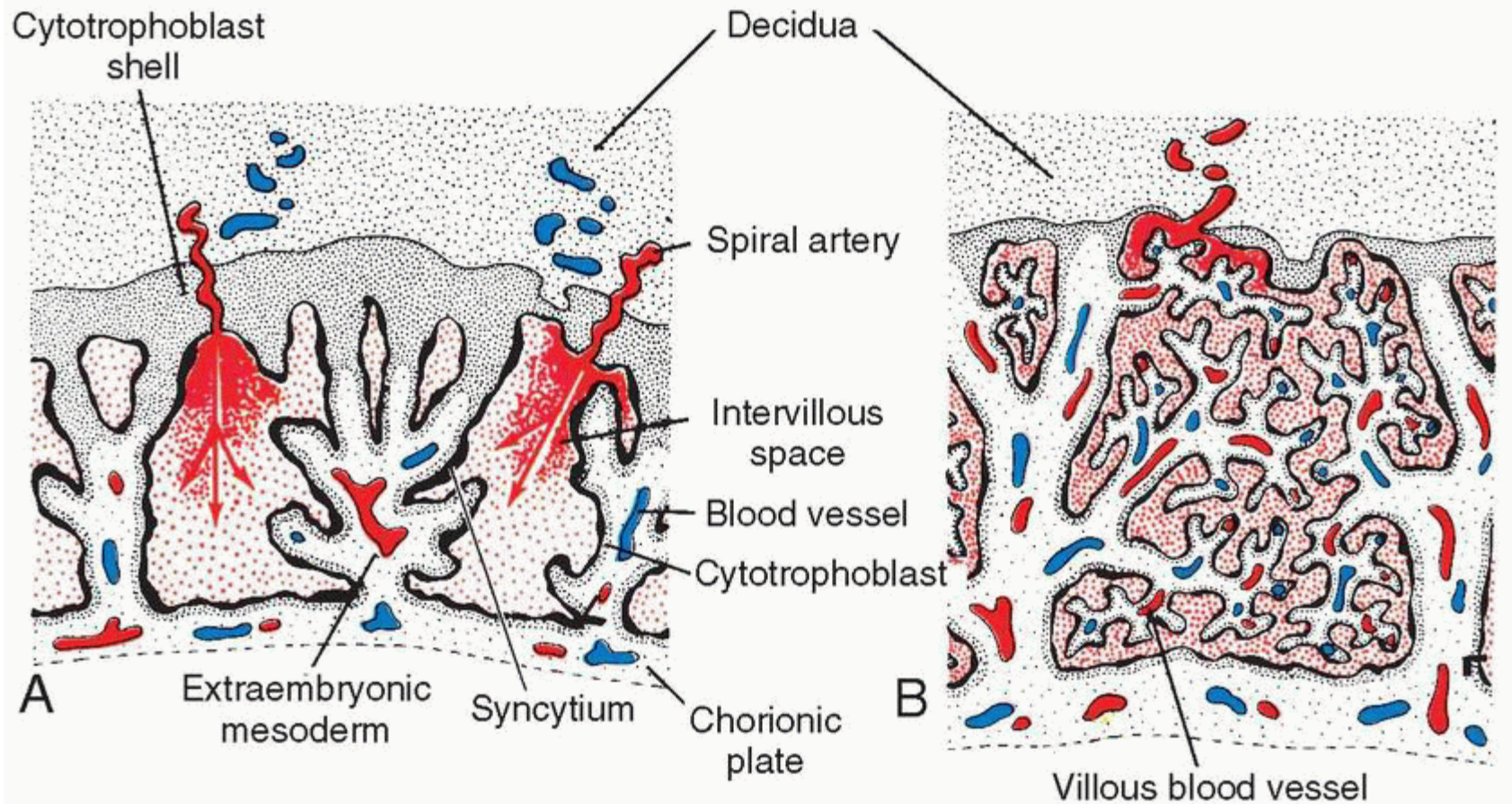




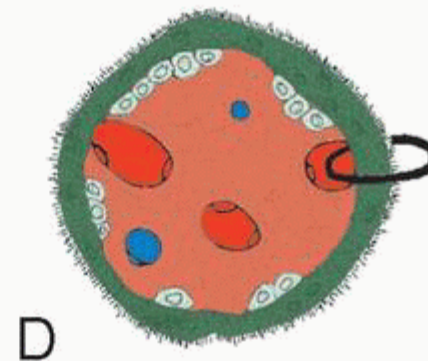
**A** Primary villus

**B** Secondary villus

**C** Tertiary villus



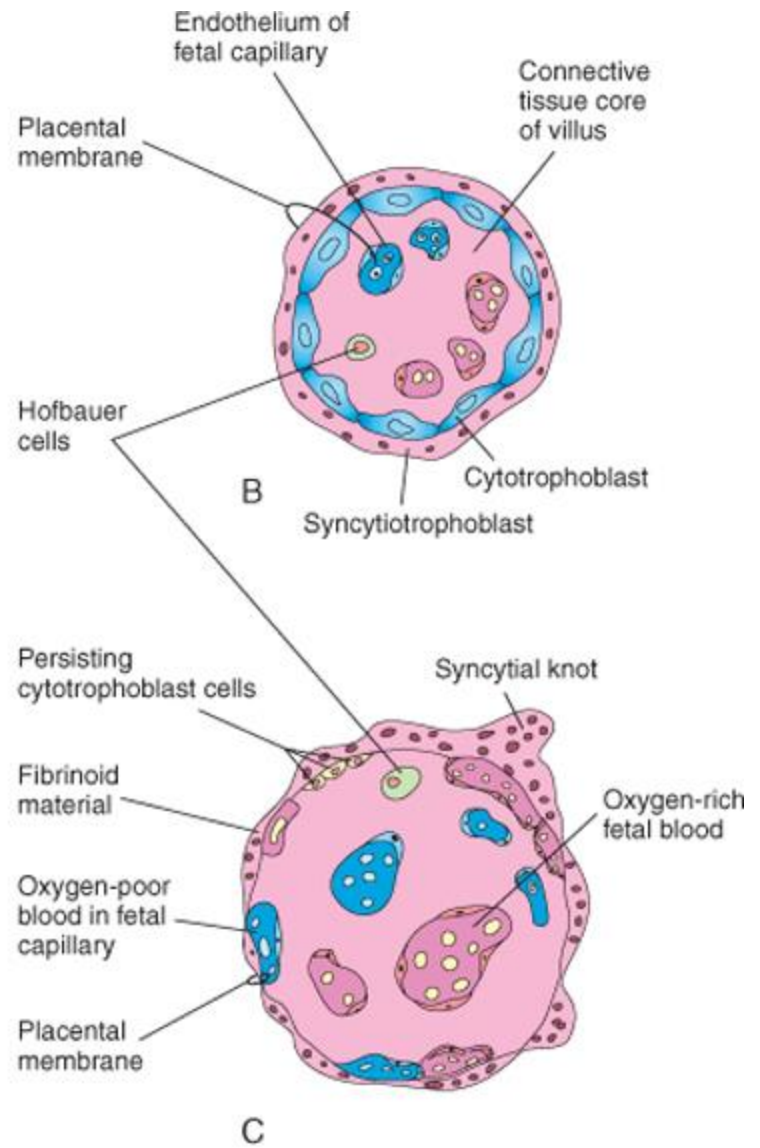
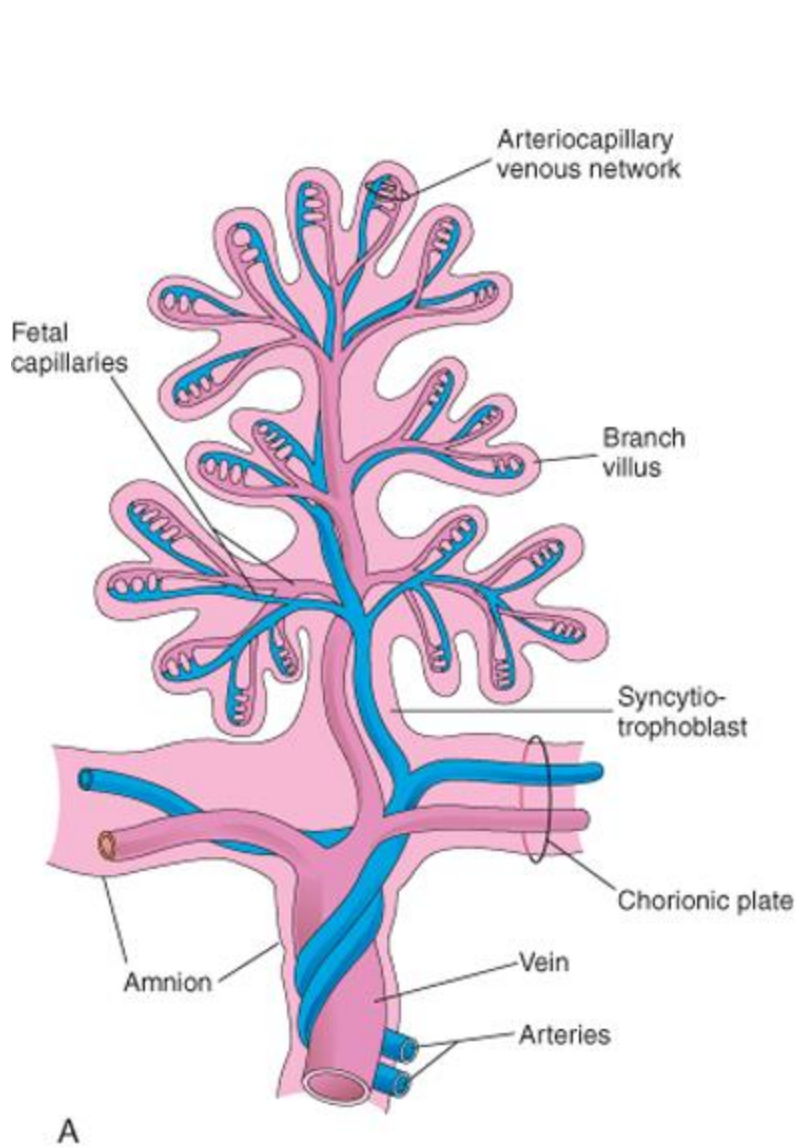
- Barrier formed by
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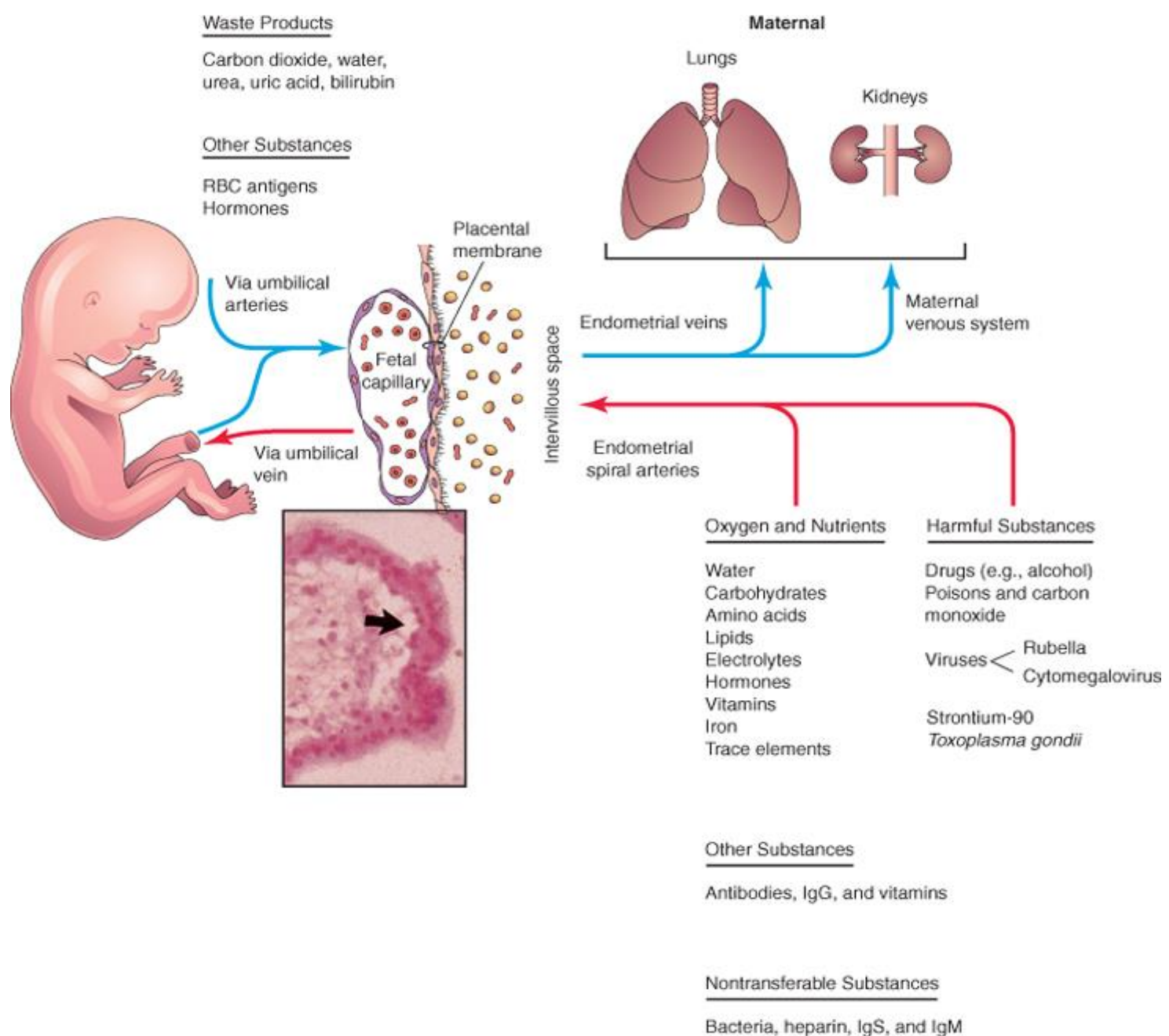


- Barrier formed by
1. Syncytium
  2. Endothelium

C

D





## **FULL-TERM PLACENTA (25%)**

Placenta is discoid with a diameter of 15 to 25 cm, is approximately 3 cm thick, and weighs about 500 to 600 g.

It has 15 to 20 slightly bulging areas, the cotyledons, covered by a thin layer of decidua basalis, are clearly recognizable .

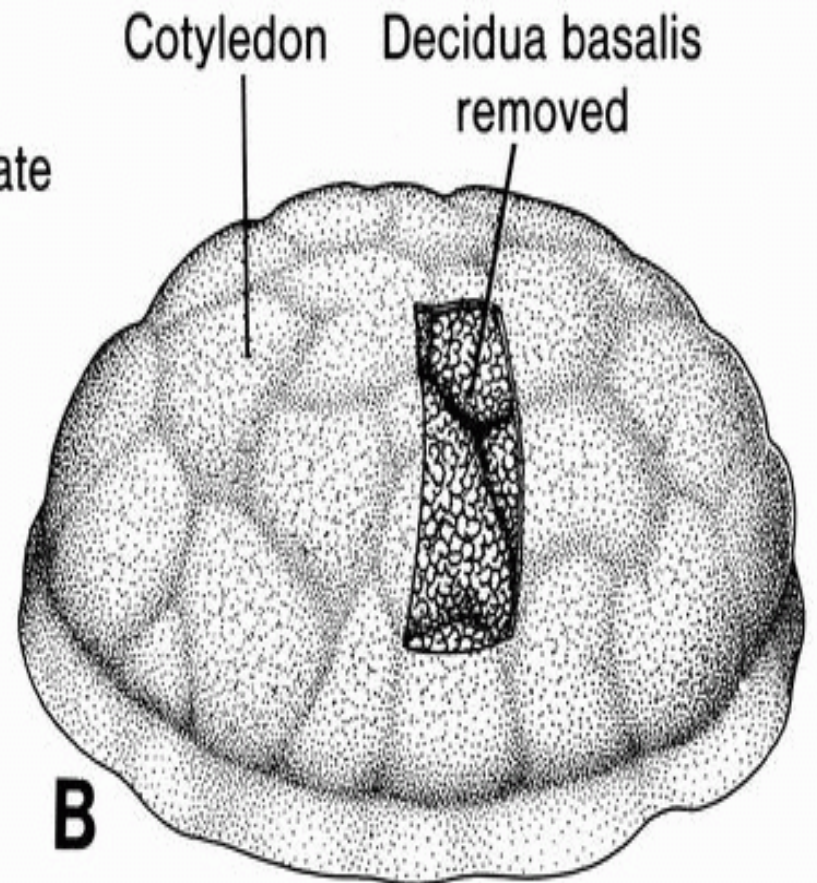
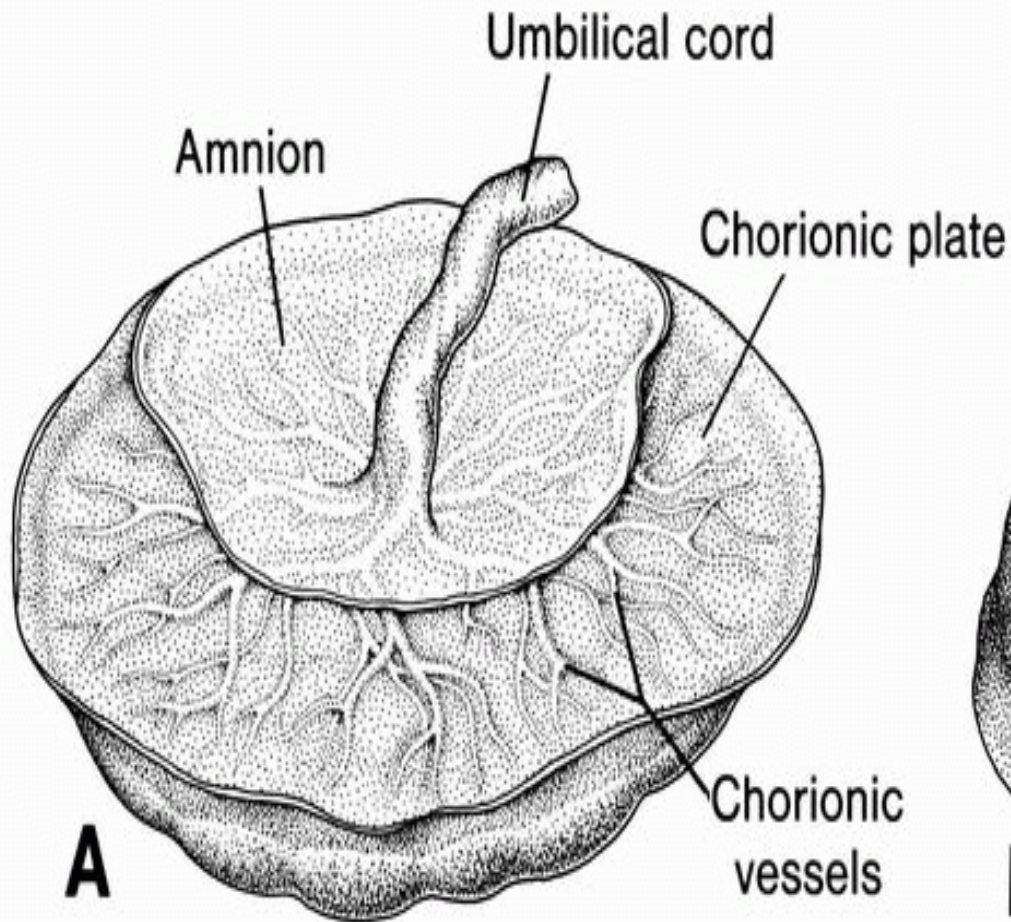
Grooves between the cotyledons are formed by decidual septa.

The fetal surface of the placenta is covered entirely by the chorionic plate.

A number of large arteries and veins, the chorionic vessels, converge toward the umbilical cord .

The chorion, in turn, is covered by the amnion.





## Circulation of the Placenta (1 vessel)

Cotyledons receive their blood through 80 to 100 **spiral arteries** that pierce the decidua and enter the intervillous spaces at more or less regular intervals.

The blood from the intervillous lakes drains back into the maternal circulation through the **endometrial veins**.

Collectively, the intervillous spaces 150 mL of blood, which is replenished about three or four times per minute.

This blood moves along the chorionic villi, which have a surface area of about **10 m<sup>2</sup>**.

These villi, the syncytium often has a brush border consisting of numerous microvilli, which greatly increases the surface area.

The placental membrane, which separates maternal and fetal blood, is initially composed of four layers:

- (1) the endothelial lining of fetal vessels,
- (2) the connective tissue in the villus core,
- (3) the cytotrophoblastic layer,
- (4) the syncytium .

Because the maternal blood in the intervillous spaces is separated from the fetal blood by a chorionic derivative, the human placenta is considered to be of the

**HEMOCHORIAL TYPE.**

**There is no mixing of maternal and fetal blood.**

# Function of the Placenta

Main functions of the placenta are

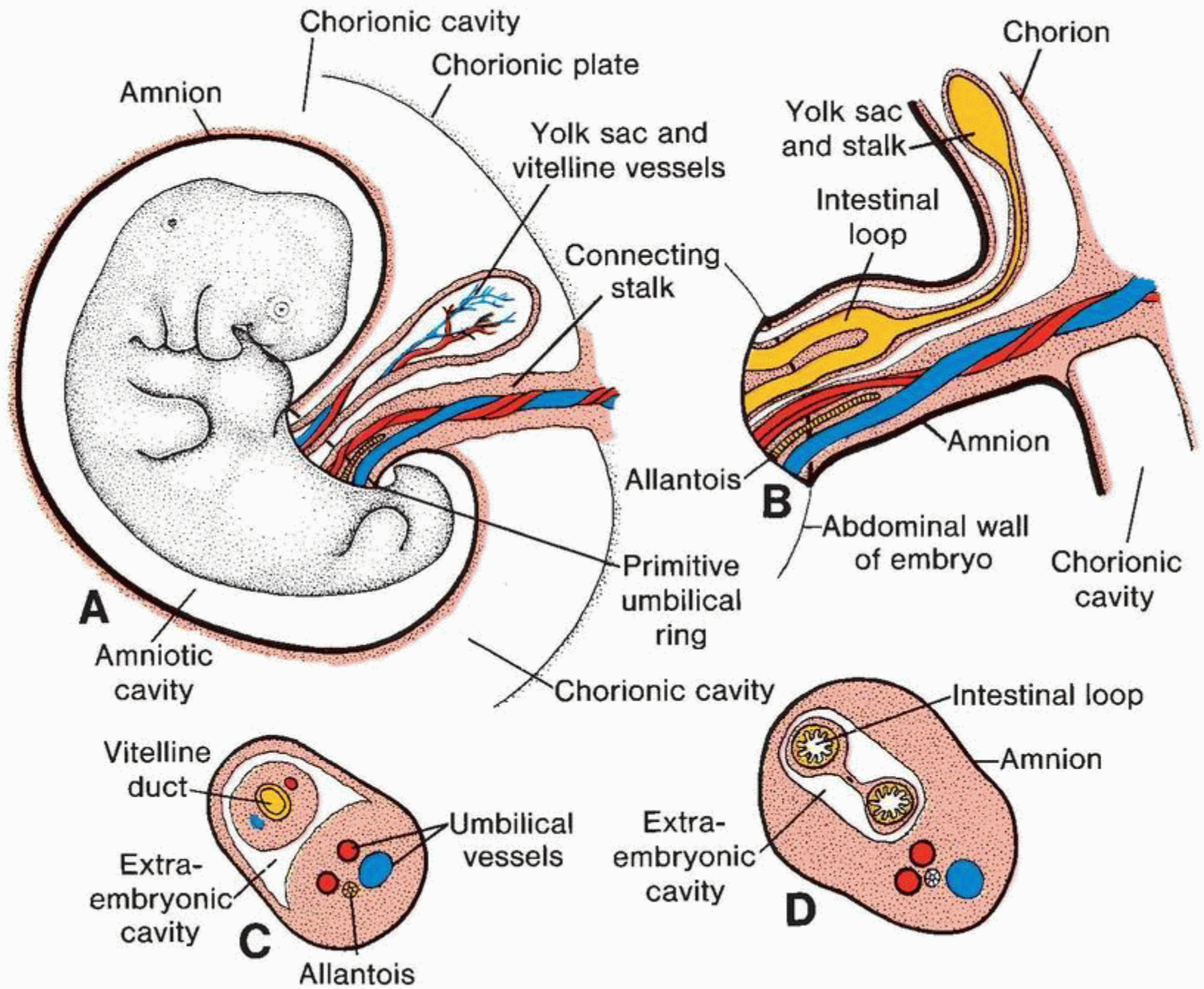
- (1) Exchange of metabolic and gaseous products between maternal and fetal bloodstreams and
- (2) Production of hormones.
- (3) Transmission of Maternal Antibodies

## **The Placental Barrier**

**Most maternal hormones do not cross the placenta.**

Many viruses—such as rubella, measles, and poliomyelitis virus—traverse the placenta without difficulty.

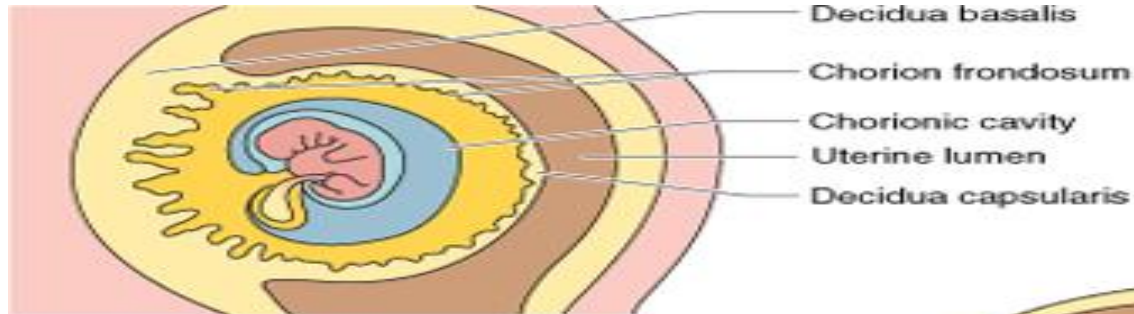
Similarly many drugs traverse the placenta without difficulty, and many cause serious damage to the embryo .



# Aging changes in placenta

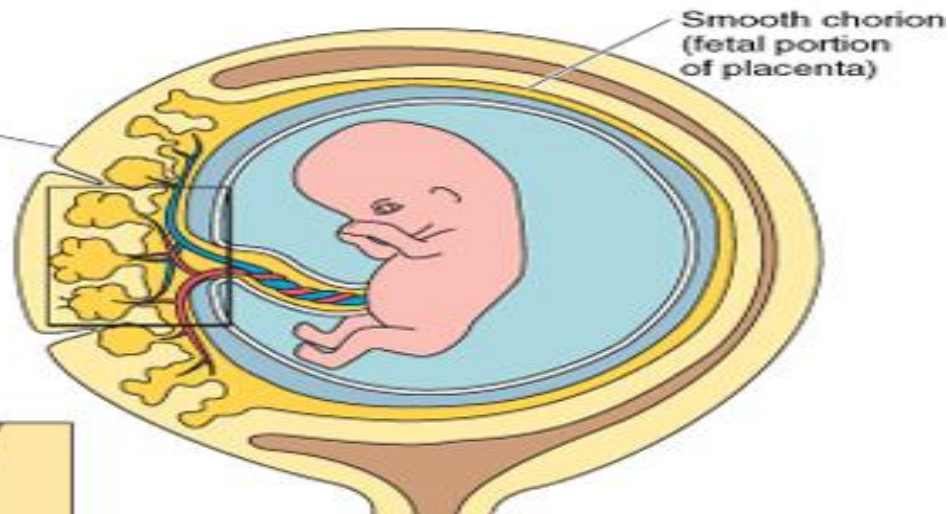
- (1) An increase in fibrous tissue in the core of the villus,**
- (2) Thickening of basement membranes in fetal capillaries,**
- (3) Obliterative changes in small capillaries of the villi,**
- (4) Excessive fibrinoid formation causes infarctions which give whitish appearance.**



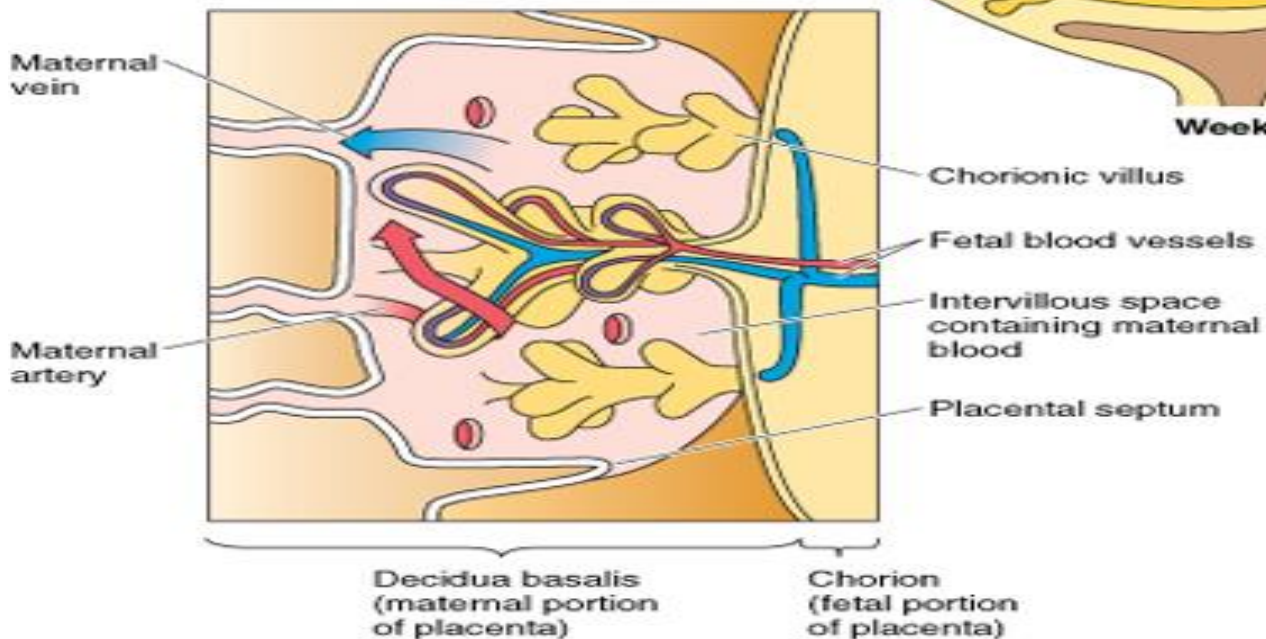


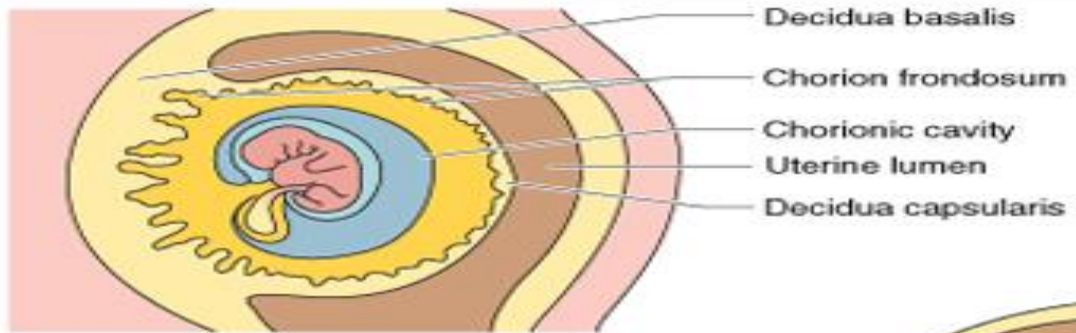
**Chorion formation  
Weeks 4-5**

Decidua basalis  
(maternal portion  
of placenta)



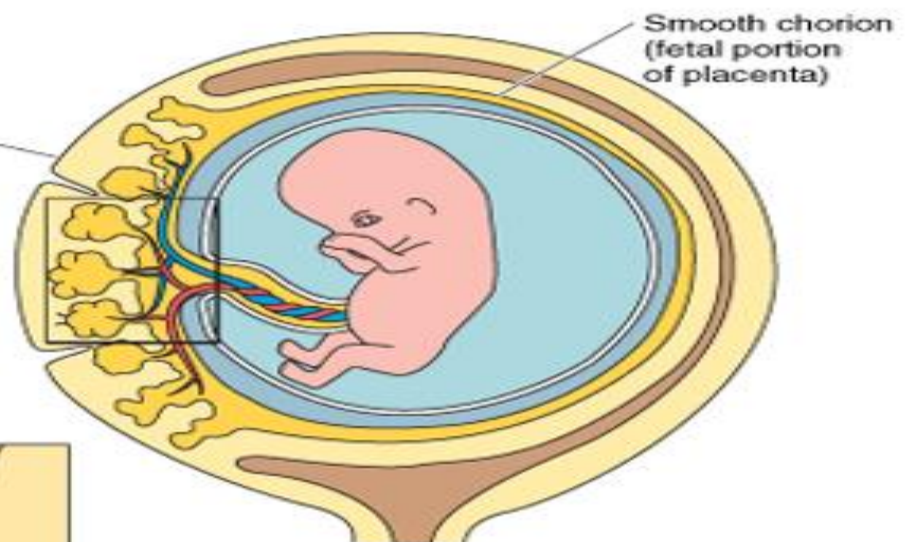
**Week 8**



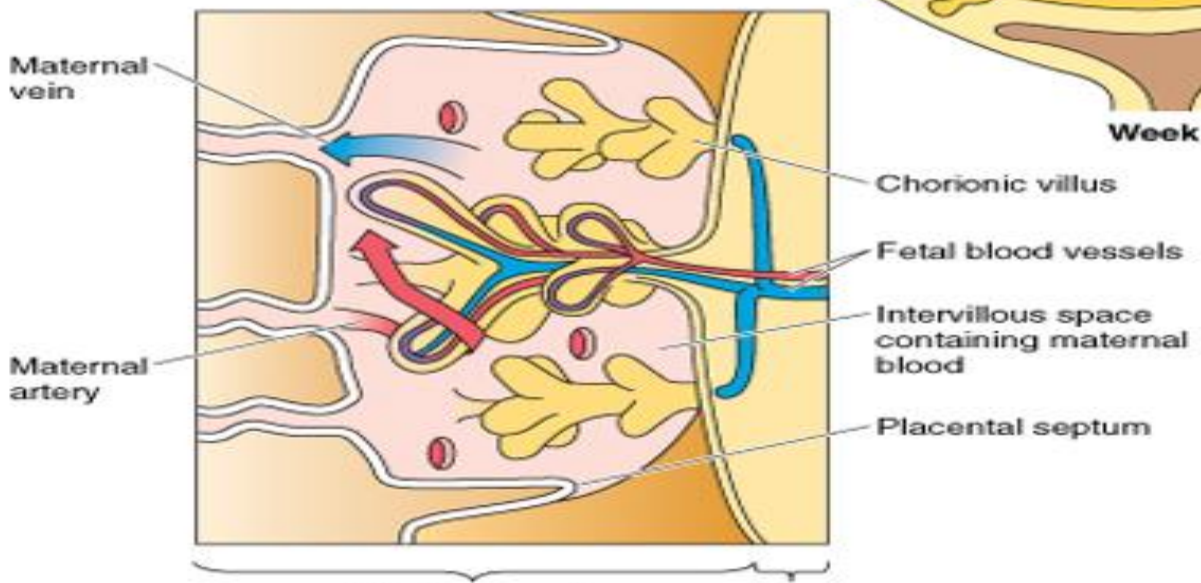


**Chorion formation  
Weeks 4-5**

Decidua basalis  
(maternal portion  
of placenta)



**Week 8**



Decidua basalis  
(maternal portion  
of placenta)

Chorion  
(fetal portion  
of placenta)

**THANKS**