

# Extraembryonic membranes in Birds

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**Followings are the objectives of the lecture:**

- What are extraembryonic membranes?
- Different types of extraembryonic membranes and their functions.

## **Extraembryonic membrane:**

These are the membranes which do not form any part of the embryo proper but performs various functions which assist in the development of the embryo.

These are discarded at the time of hatching.

These membranes formed outside the embryo.

**Amniotes:** These are the vertebrates group whose eggs contain extraembryonic membranes for protecting the embryo. They lay eggs on the land.  
Example: Reptiles, Birds and Mammals.

**Anamniotes:** These are the vertebrates group whose eggs do not contain extraembryonic membranes during embryonic development. They lay eggs in the water.  
Example: Fish, Amphibia.

**There are four types of extraembryonic membranes in birds:**

1. Yolk sac.
2. Amnion.
3. Chorion.
4. Allantois.

## 1. Yolk sac:

- Formed from splanchnopleure (inner endoderm and outer mesoderm)
- Well developed in the animals with megalecithal egg as reptiles, birds and Prototheria.
- Formed completely on the 9<sup>th</sup> day of incubation. In human it is vestigial.

## **Functions of Yolk sac:**

- It surrounds the yolk. Its main function is in digestion. It serve as extraembryonic gut.
- It help in digestion of yolk and transfer the digested material to the developing embryo.
- First respiratory organ in the embryo.
- Form yolk sac placenta in the marsupials.

## **2. Amnion:**

Formed of somatopleure (inner ectoderm and outer mesoderm).

It surrounds the embryo. It appears after 30 hours of incubation.

A amniotic cavity is present between the amnion membrane and the embryo, which filled with the amniotic fluid. In this fluid filled cavity embryo floats.



## **Functions of Amnion:**

- Protection of the embryo from the mechanical injury and desiccation.
- Amniotic fluid acts as shock absorber.
- Protect from sudden temperature changes.

### **3. Chorion:**

Formed of somatopleure (outer ectoderm and inner mesoderm).

It forms the outermost boundary.

Space between amnion and chorion is called chorionic cavity which further provides protection to the embryo.

## **Functions of Chorion:**

- In reptiles, birds and prototherians, chorion along with allantois acts as extra embryonic lung and helps in exchange of gases.
- Nutrition and protection.

#### **4. Allantois:**

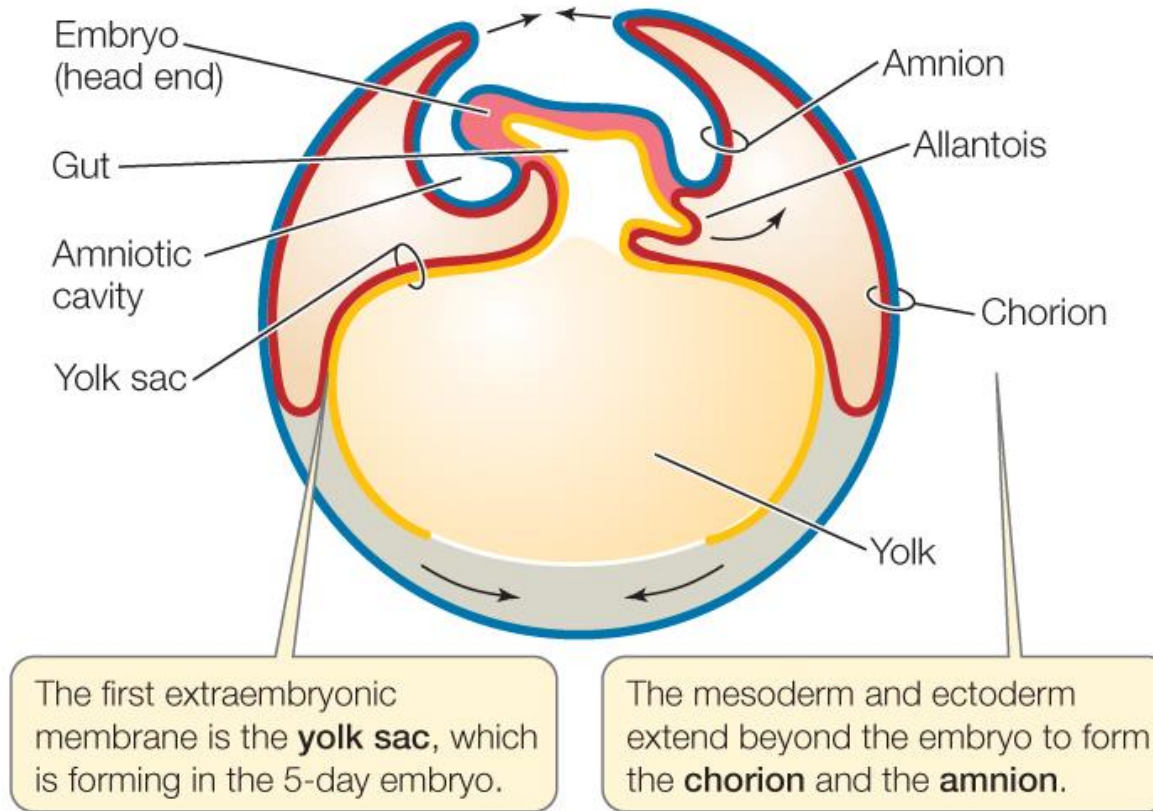
Formed of splanchnopleure (inner endoderm and outer splanchnic mesoderm).

Connected with the hindgut of the embryo.

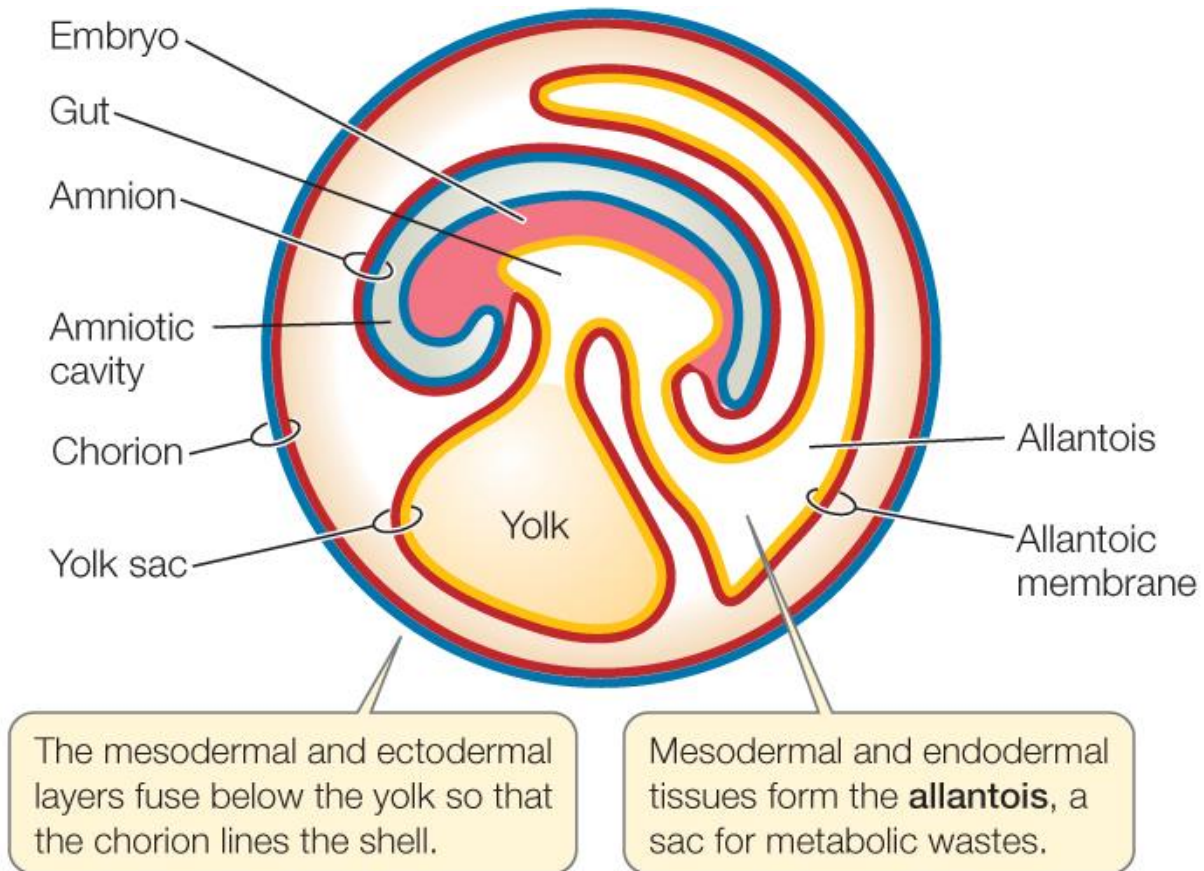
Develops on the third day of incubation from the floor of the hind gut as a outgrowth.

## Functions of Allantois:

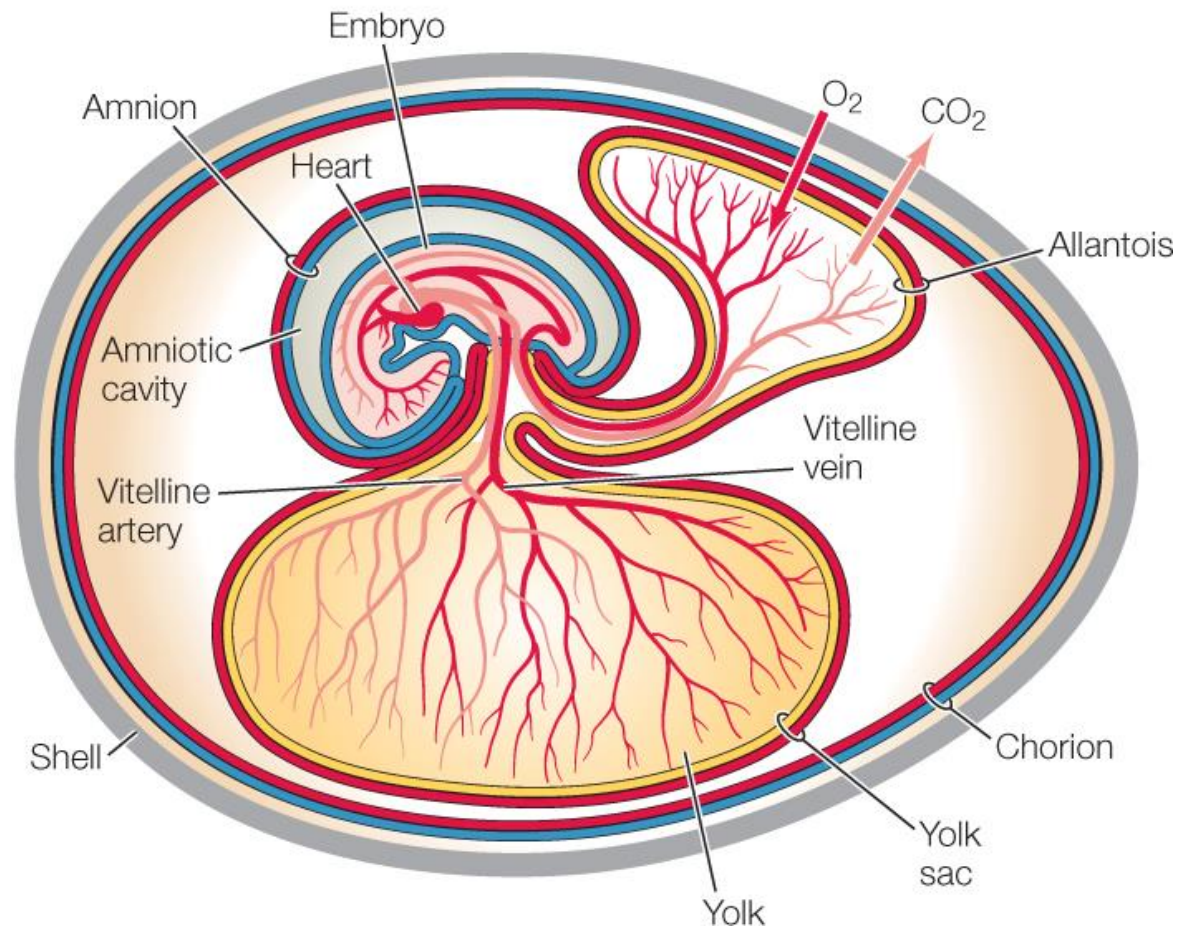
- Act as reservoir for the storing the excretory wastes of the embryo. Considered as extra embryonic kidney.
- Also helps in digestion and nutrition from albumen and calcium of the shell.
- It grows in the chorionic cavity. Its outer membrane fuse with the inner membrane of the chorion and forms allanto chorion which is highly vascular. Act as extraembryonic lung and provides surface for the gaseous exchange.



## 5 day chick embryo without shell

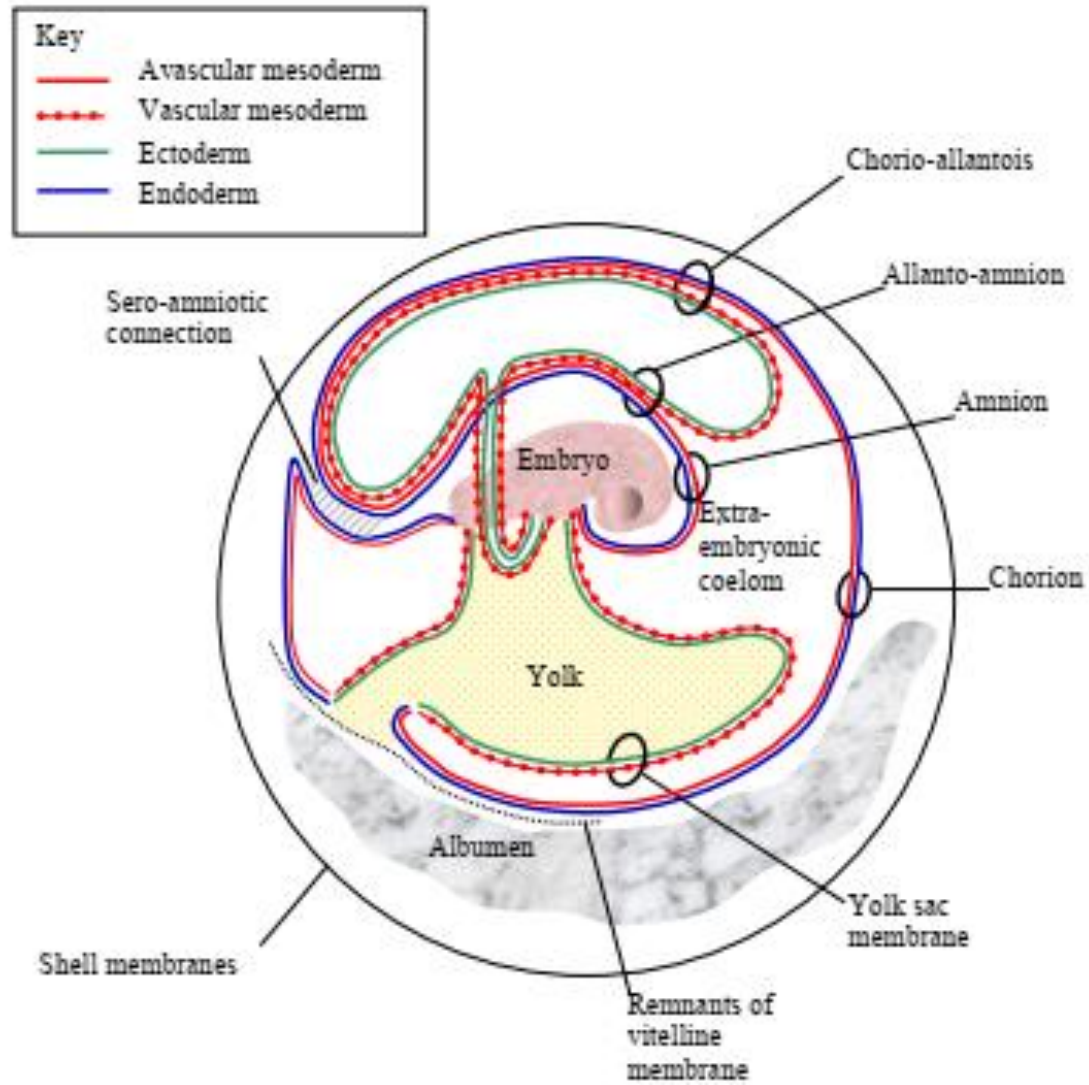


## 6 day chick embryo without shell

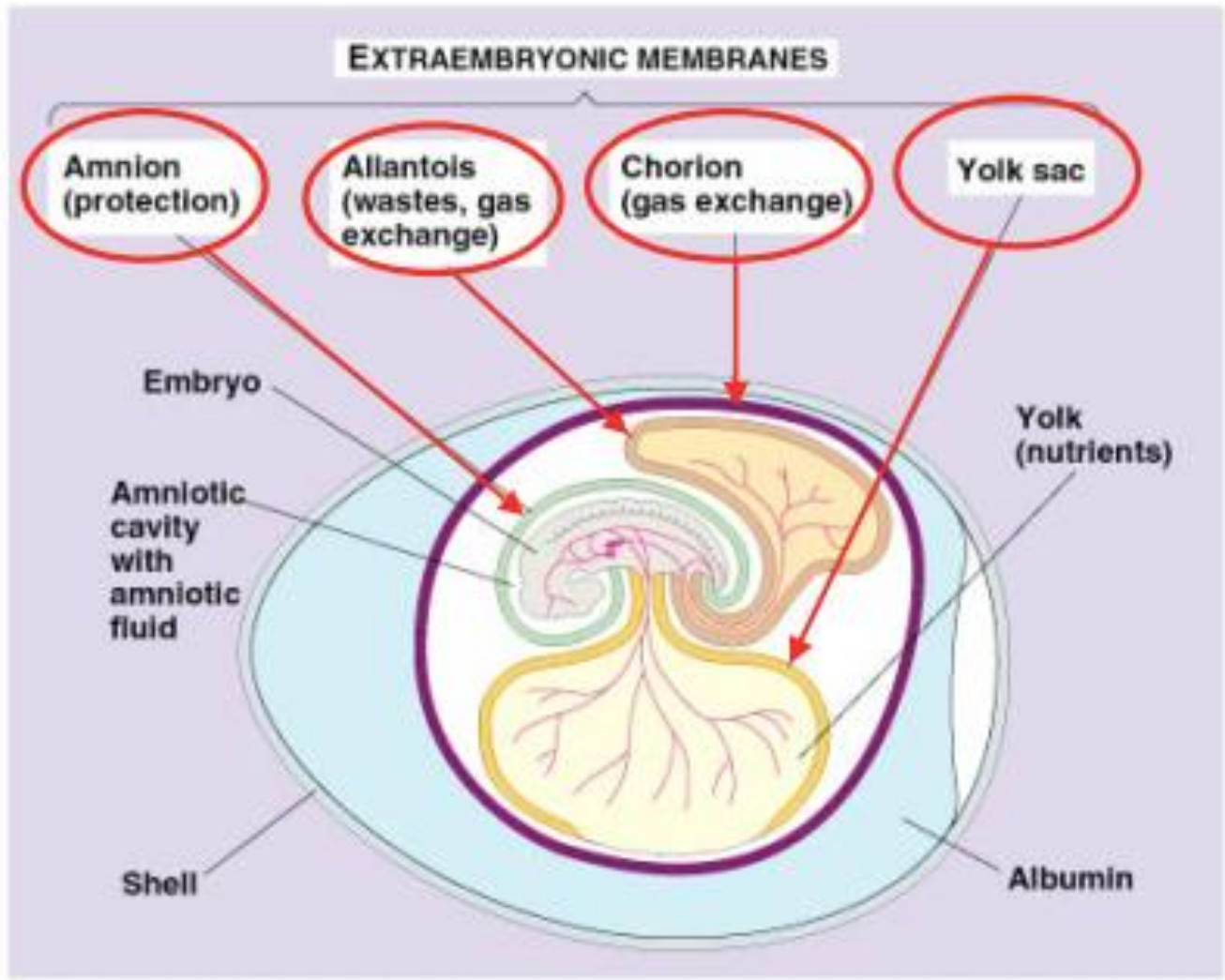


**7 day chick embryo.**





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**THANK YOU**