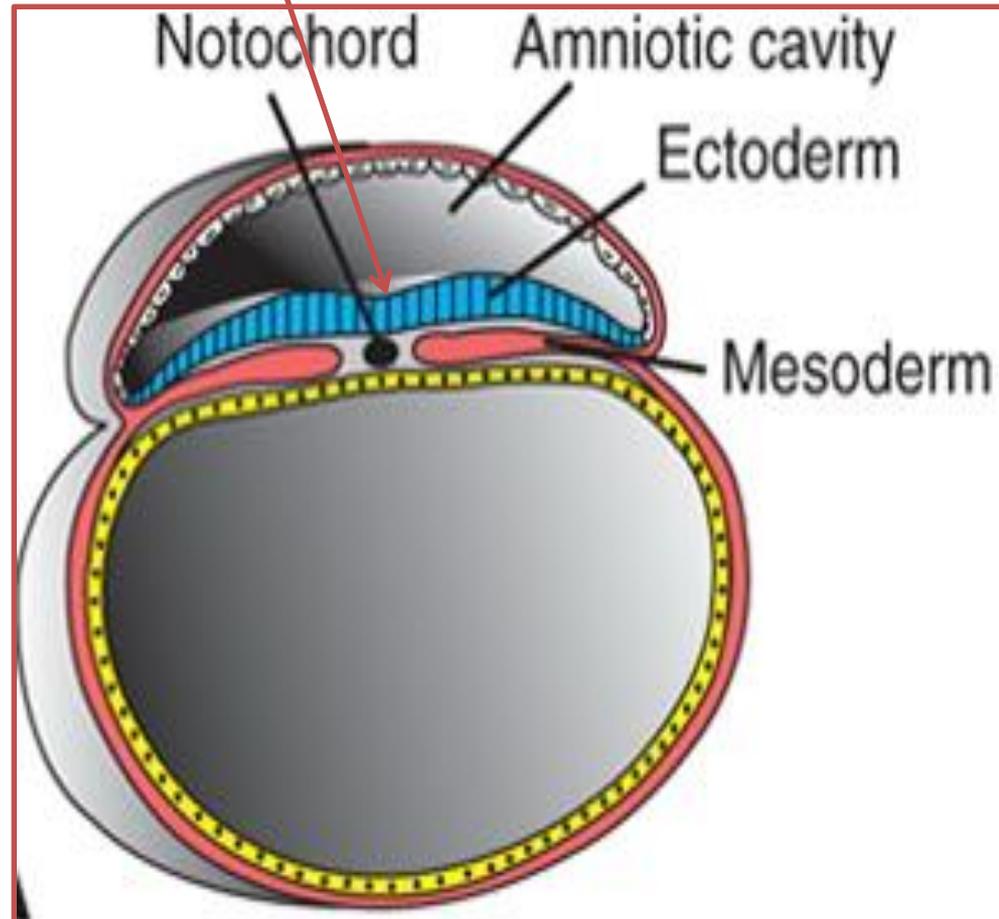
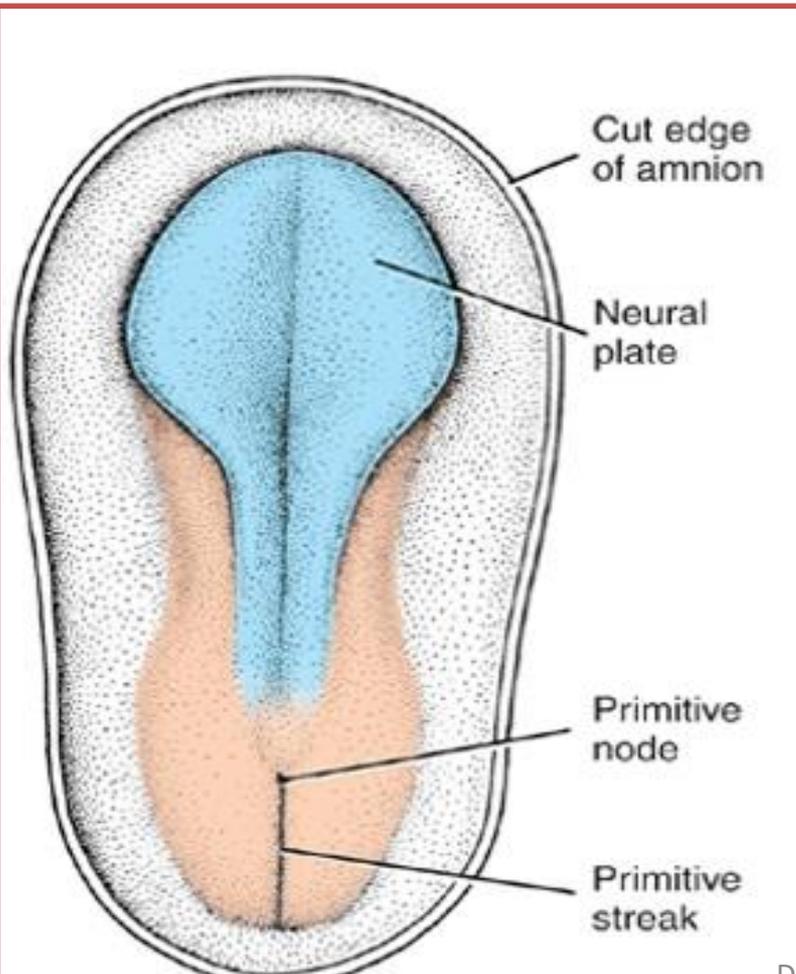


DERIVATIVES OF THE ECTODERMAL GERM LAYER

Development of the neural tube

At the middle of the epiblast another swelling called
1- neural plate appears

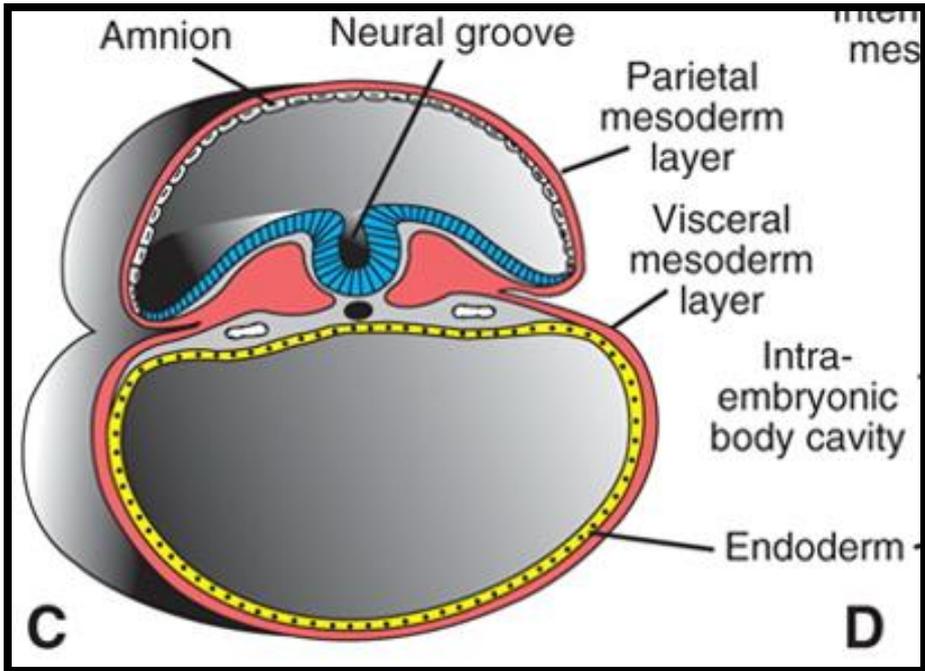
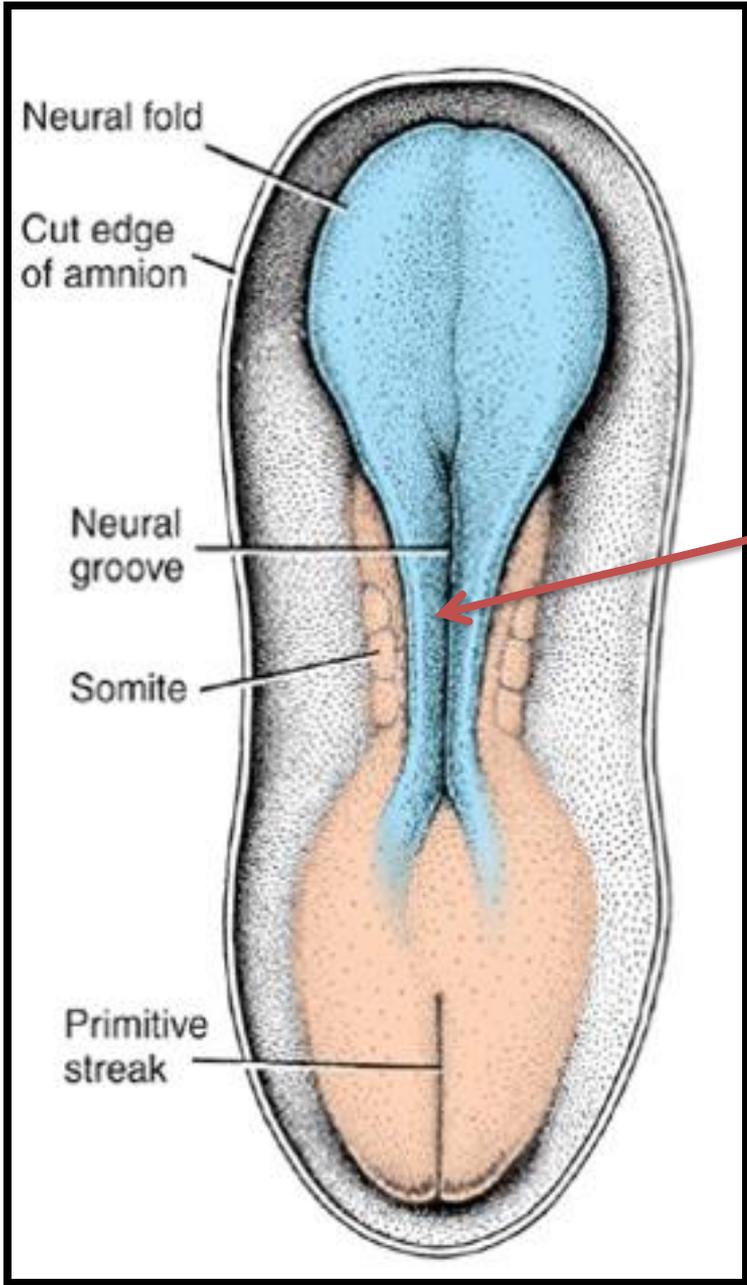
The neural plate replaces the receding primitive streak and closes the pore formed before



By the end of the third week,
the lateral edges of the neural plate become
more elevated to form
neural folds

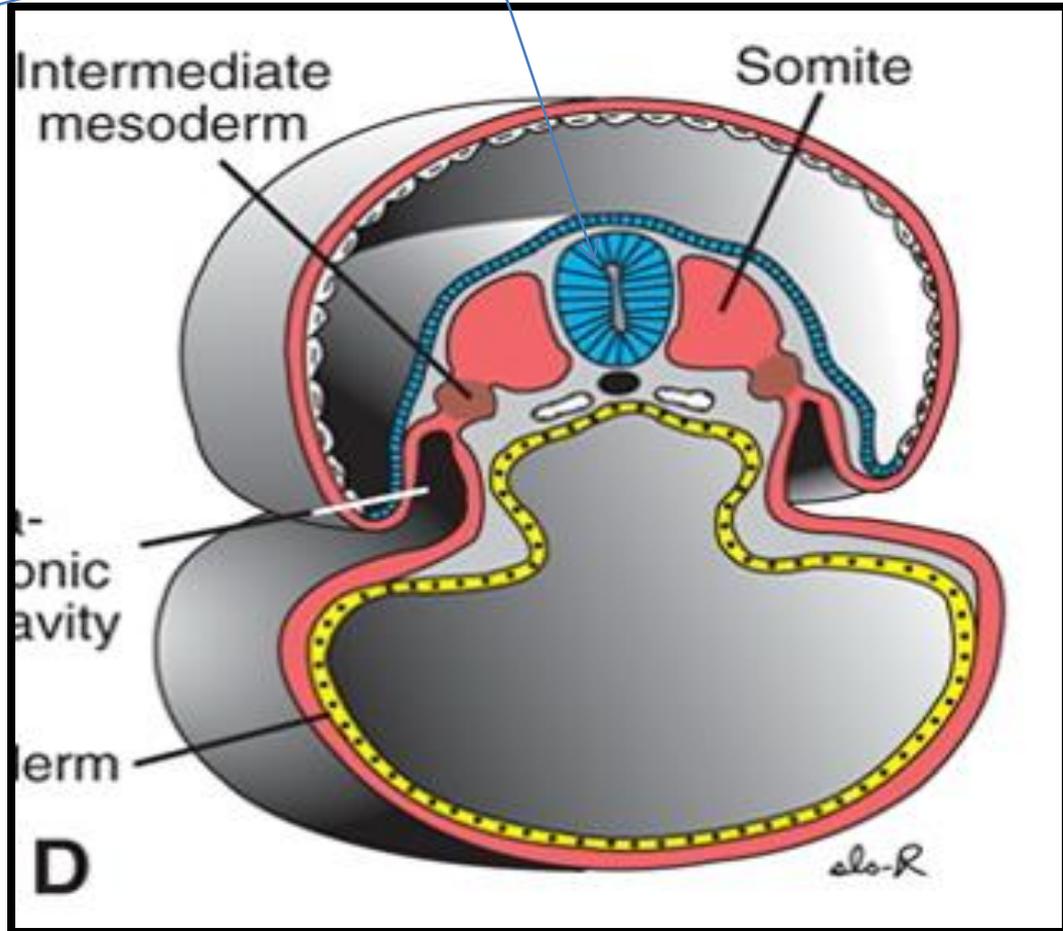
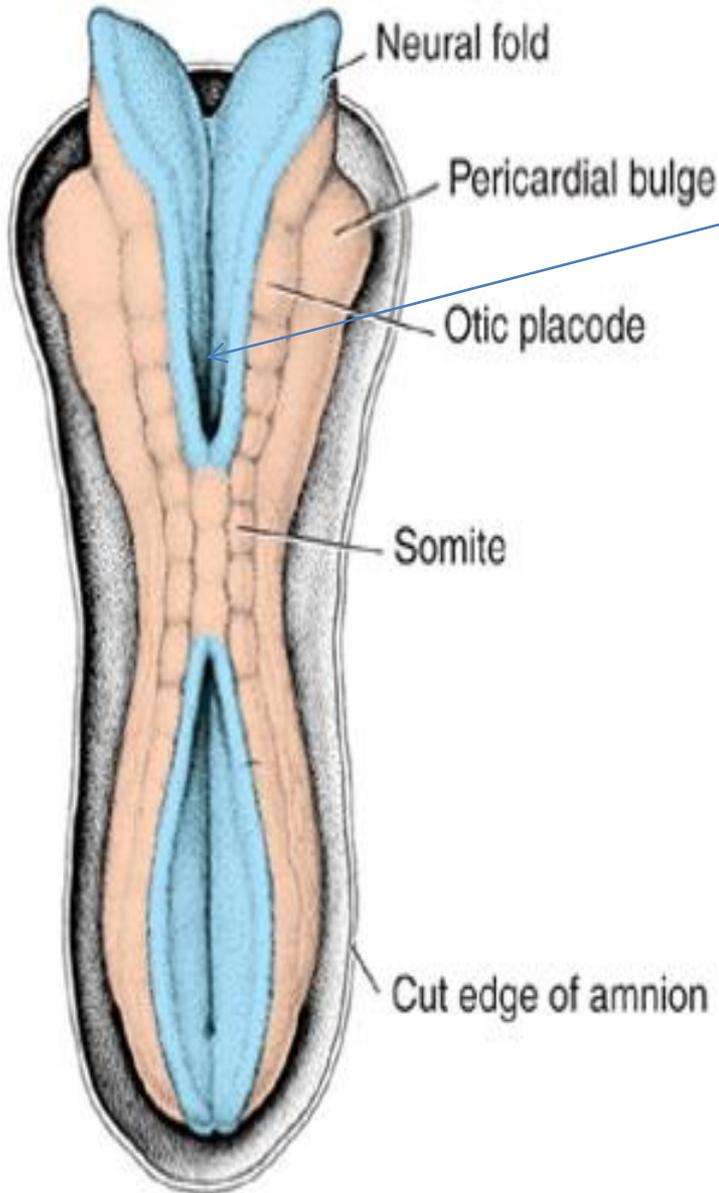
the depressed midregion forms the

2-Neural groove



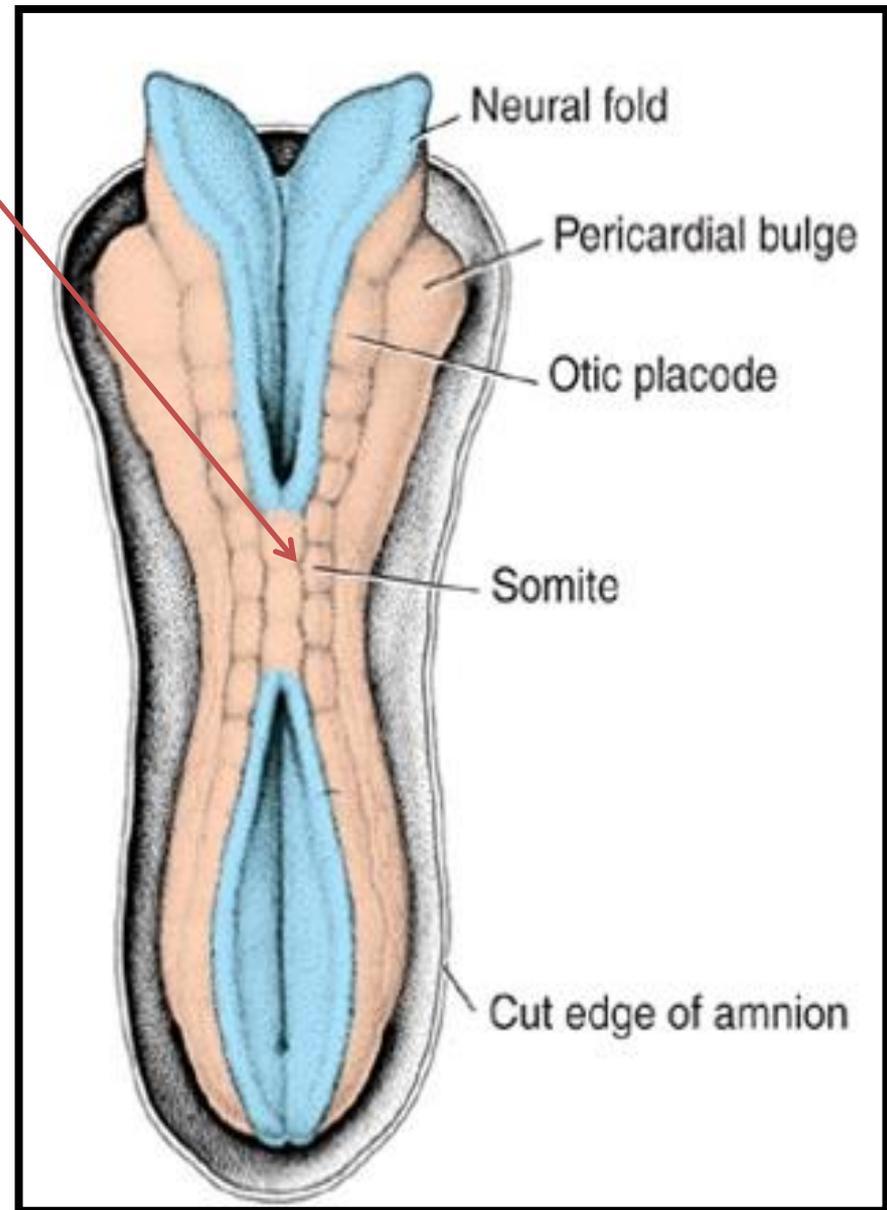
Gradually, the neural folds approach each other in the midline, where they fuse and form:

3-Neural tube

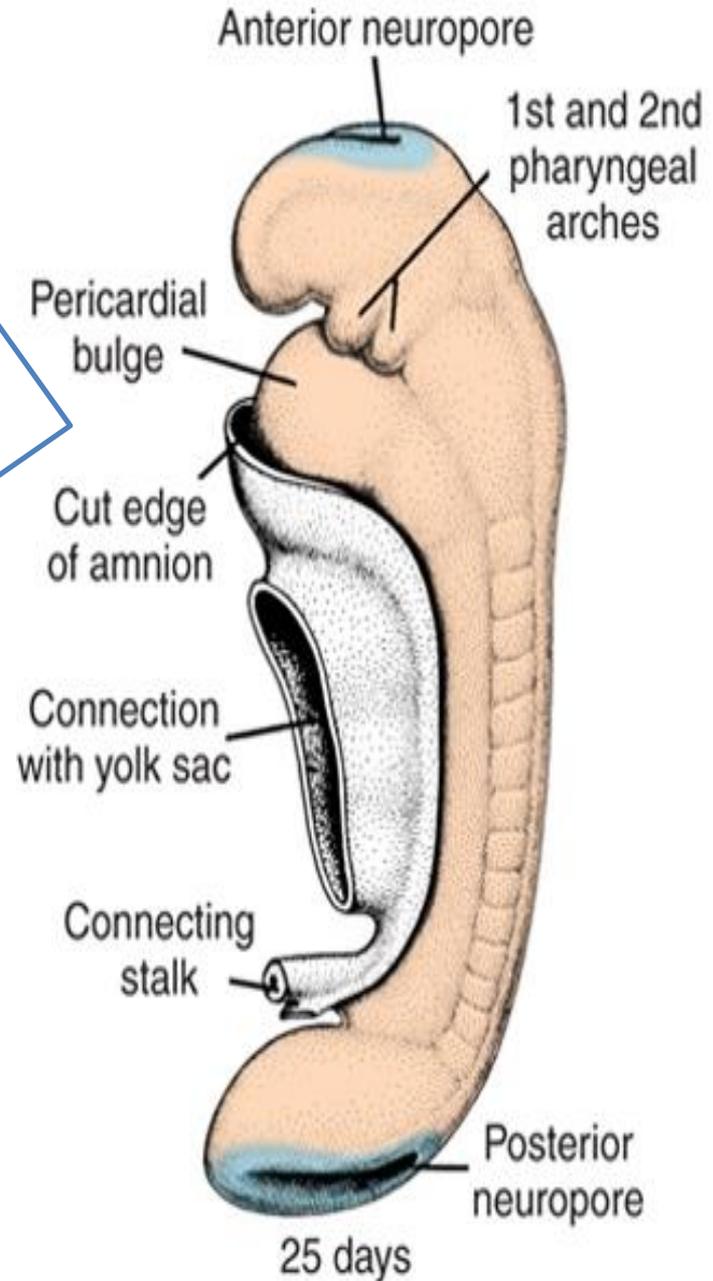


Fusion begins in the cervical region (fifth somite) and proceeds cranially and caudally. As a result the **neural tube is formed.**

Until fusion is complete the cephalic and caudal ends of the neural tube communicate with the amniotic cavity by way of the **cranial and caudal neuropores**



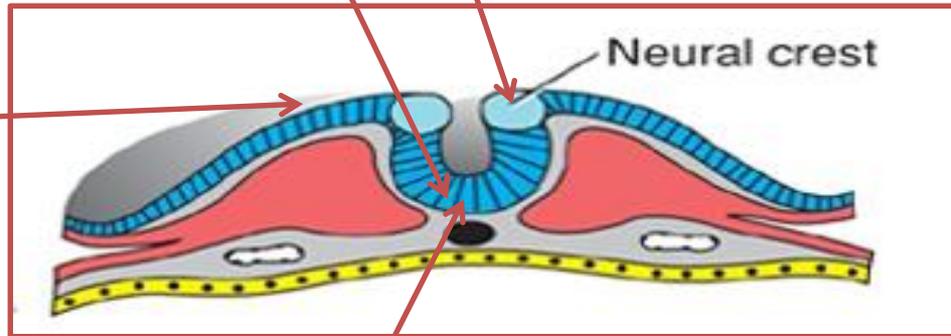
Closure of
the cranial neuropore
occurs at approximately
day **25**
whereas the posterior neuropore closes at
day **27**



Parts of the neural tube

- 1-neural crest
- 2-alar plate
- 3-basal plate

alar plate



basal plate

THE NERVOUS SYSTEM IS FORMED FROM
THE ECTODERM
(THE NEURAL TUBE)

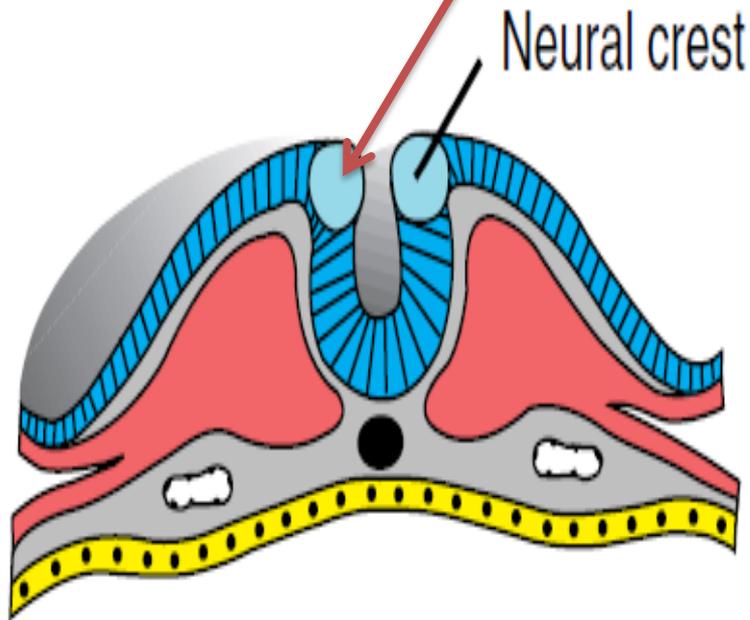
The **neural crest** gives rise to **the ganglia**

The **alar plate** gives rise to **the sensory** part of the nervous
system

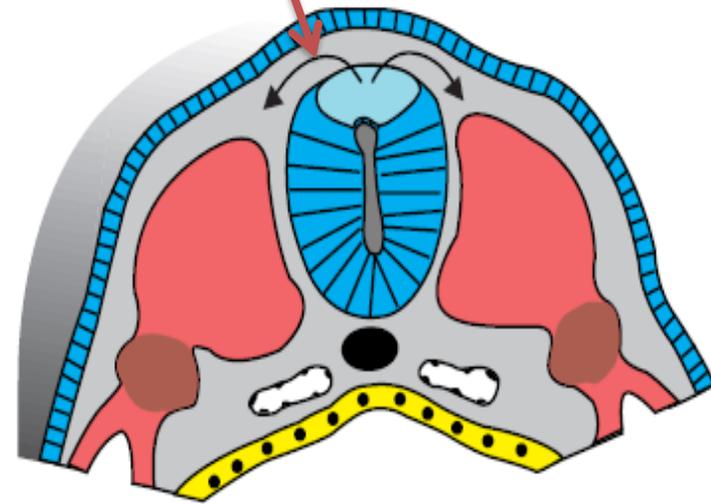
The **basal plate** gives rise to **the motor** part of the nervous
system

NEURAL CREST

Cells at the lateral border or crest of the neuroectoderm begin to dissociate from their neighbors AND **undergo an epithelial-to-mesenchymal transition** as it leaves the neuroectoderm by **active migration and displacement** to enter the underlying mesoderm



A



B

In general terms, the ectodermal germ layer gives rise to organs and structures that maintain contact with the outside world:

(a) the central nervous

(b) the peripheral nervous system

c) the sensory epithelium of the ear, nose, and eye

(d) the epidermis, including the hair and nails

In addition,
it gives rise to subcutaneous glands,
the mammary glands,
the pituitary
gland,
and enamel of the teeth.

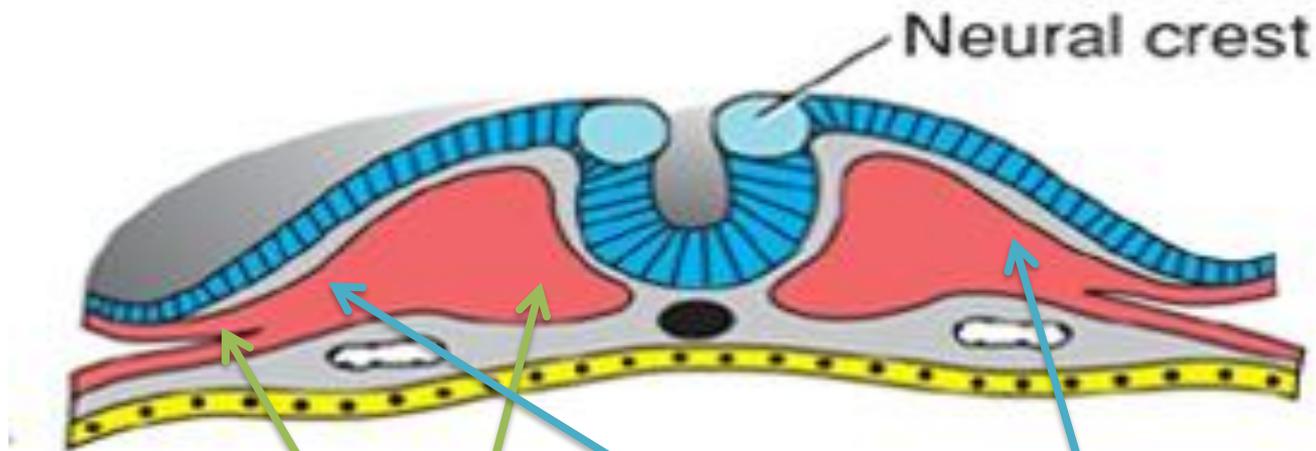
Teratogenesis Associated With Gastrulation

Because this stage is reached 2 weeks after fertilization, it is **approximately 4 weeks** from the last menses. Therefore, the woman may not recognize she is pregnant, having assumed that menstruation is late and will begin shortly. Consequently, she may not take precautions she would normally consider if she knew she was pregnant

High doses of alcohol at this stage kill cells in the anterior midline of the germ disc, producing a deficiency of the midline in craniofacial structures and resulting in **holoprosencephaly**.
In such a child, the forebrain is small

DERIVATIVES OF THE MESODERMAL GERM LAYER

Paraxial mesoderm



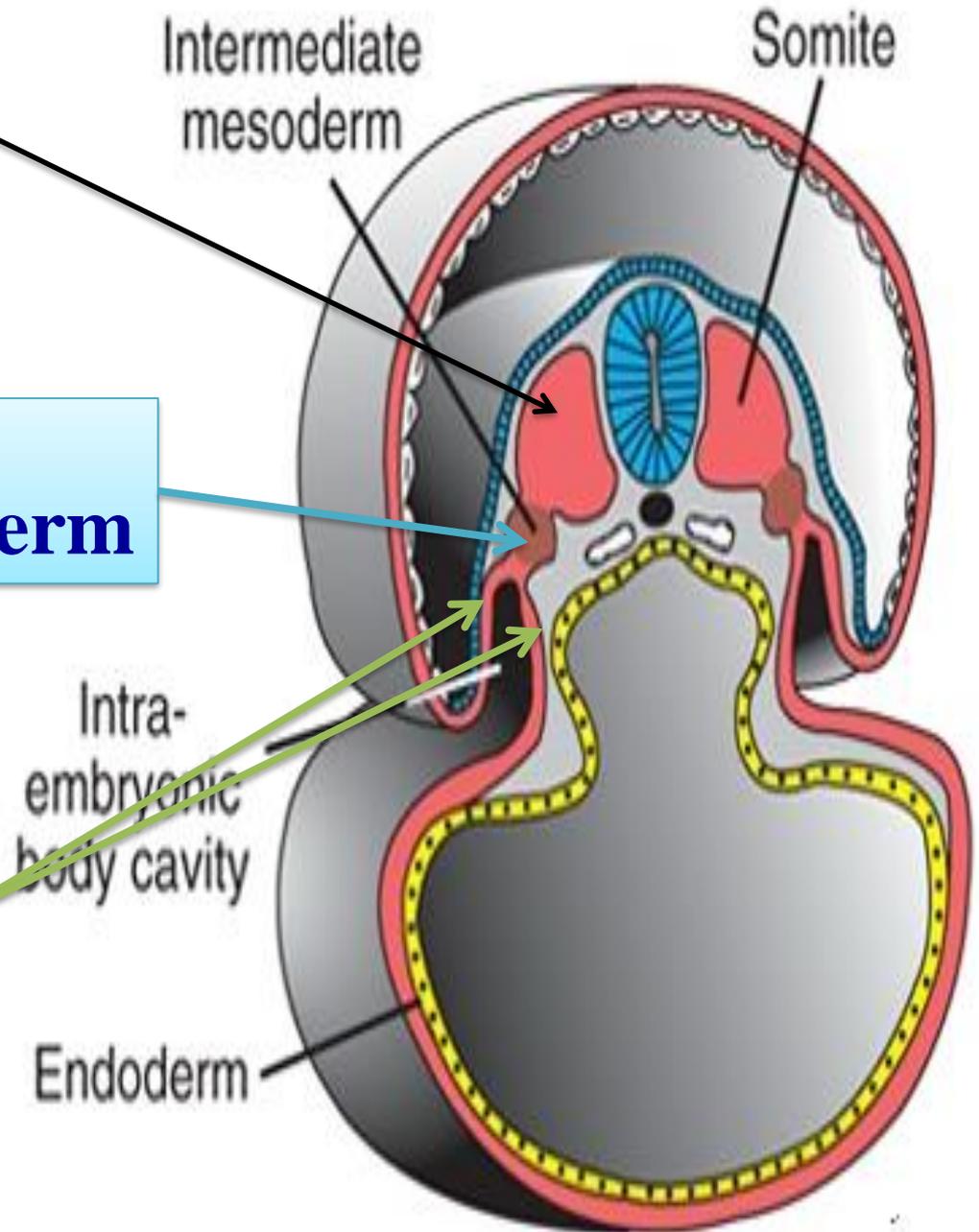
It develops into
TWO PERIPHERAL MASSES
and a **constriction in the middle**

Called:

1-Medial mesoderm

2-Intermediate mesoderm

3-lateral mesoderm

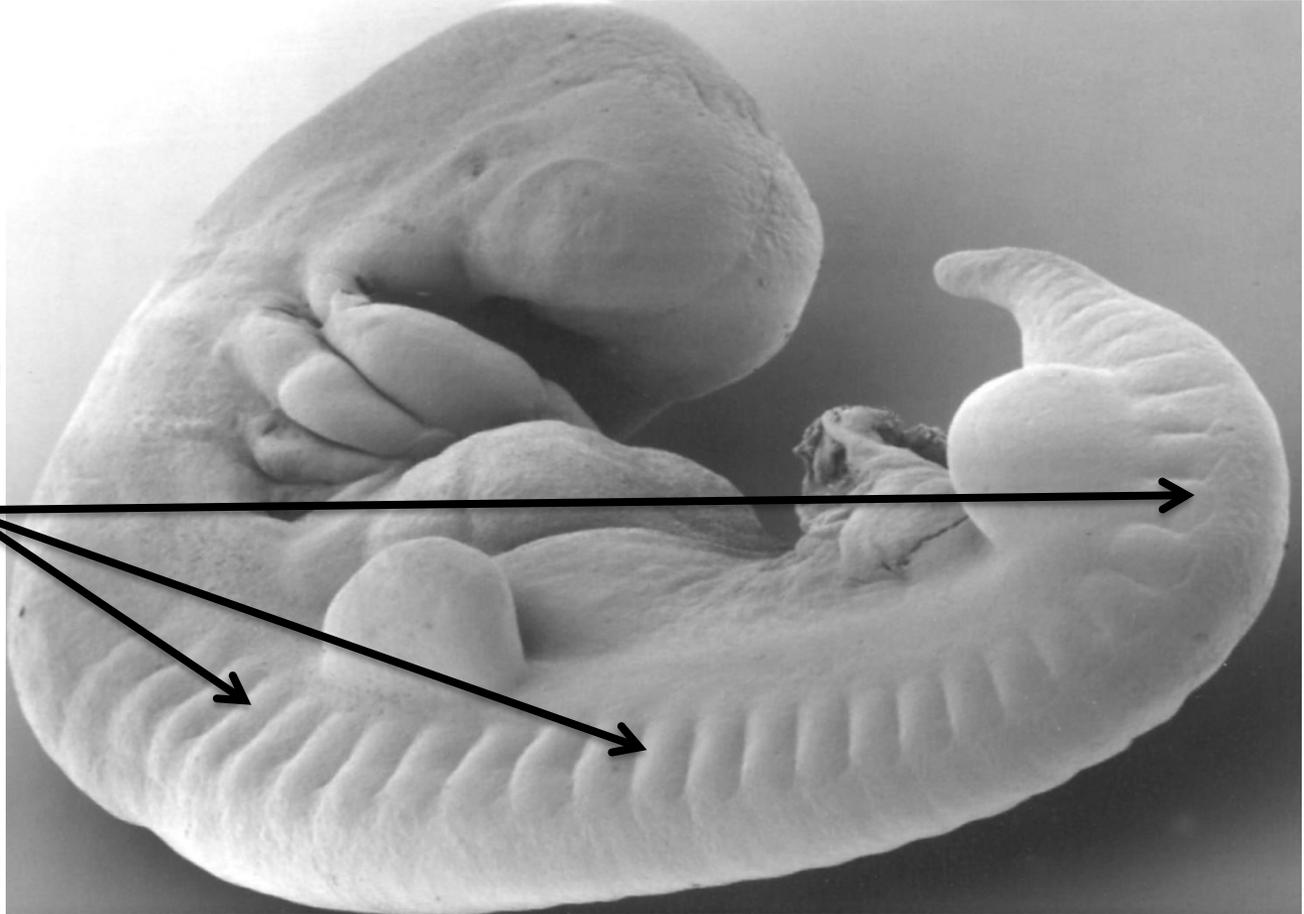


Medial mesoderm

- The medial mesoderm enlarges pushing the ectoderm upwards to give the **somites**

➤ As the embryo develops the number of the somites
Increases from one to reach about 44-45 somites
➤ when the embryo is completely developed

About 10 somites vanish when the tail of the embryo is lost



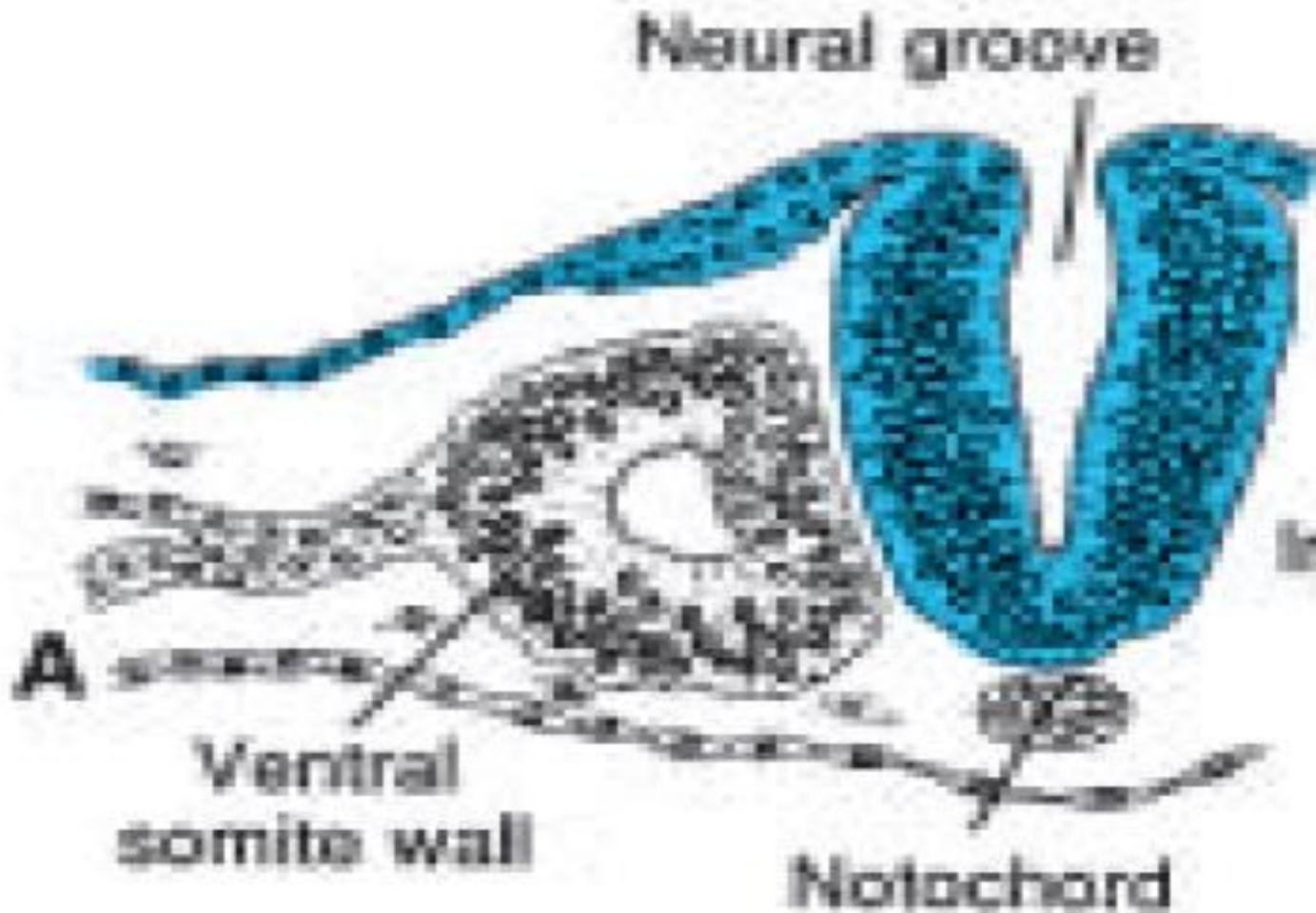
- ❖ **The first pair** of somites arises in the **occipital region** of the embryo at approximately the 20th day of development
- ❖ From here, new somites appear in craniocaudal sequence at a rate of approximately three pairs per day until the end **of the fifth week**,



There are:
four occipital
eight cervical
12 thoracic
five lumbar
five sacral,
and eight to 10 coccygeal pairs.

The
first occipital and the last five to seven coccygeal somites later disappear

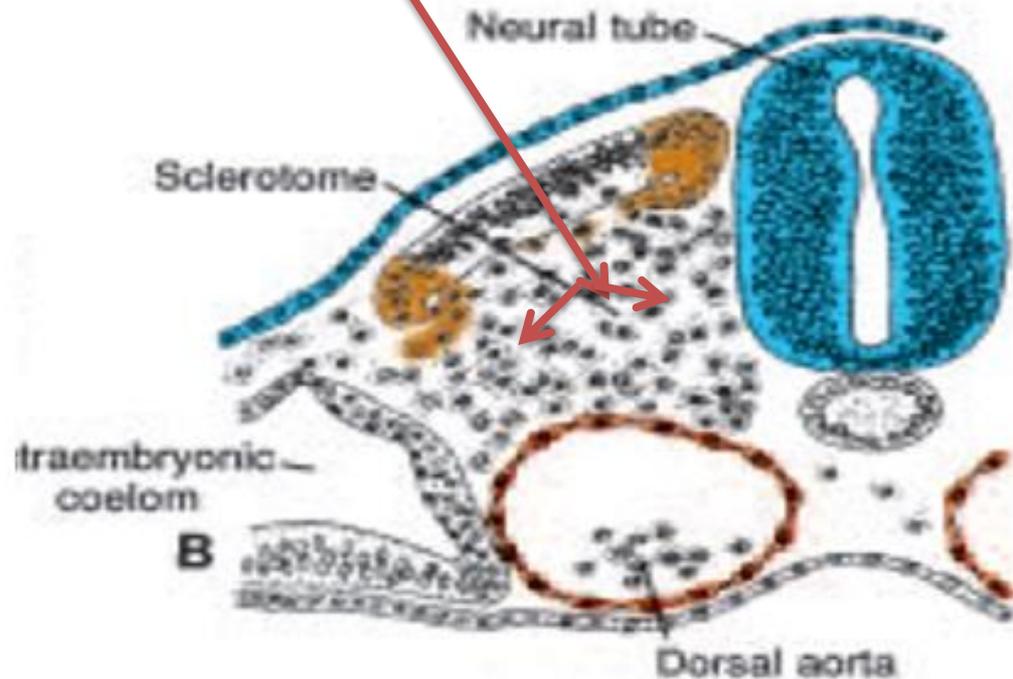
WHAT IS THE destiny OF EACH SOMITE?



By the beginning of the fourth week
cells forming the *ventral and medial walls of the somite*
lose their compact organization,
and shift their position to surround the notochord
These cells, collectively known as

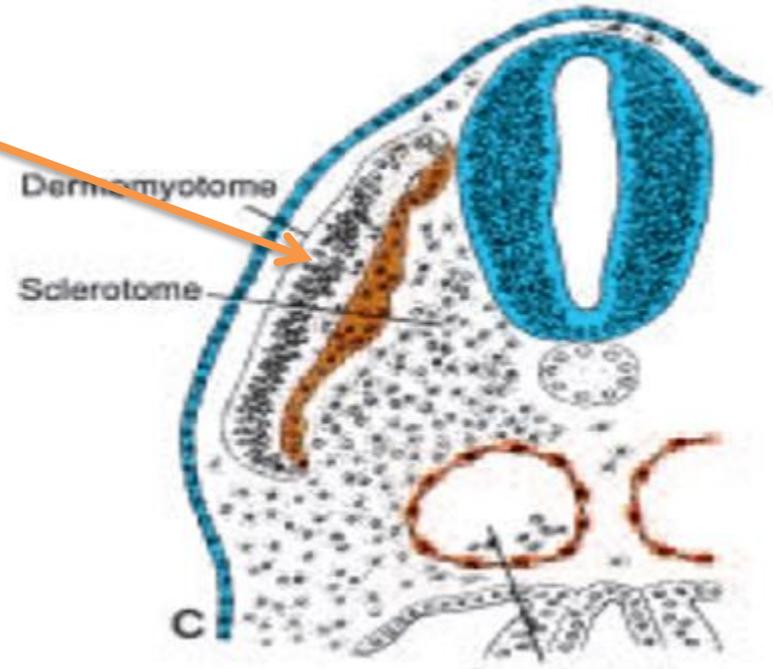
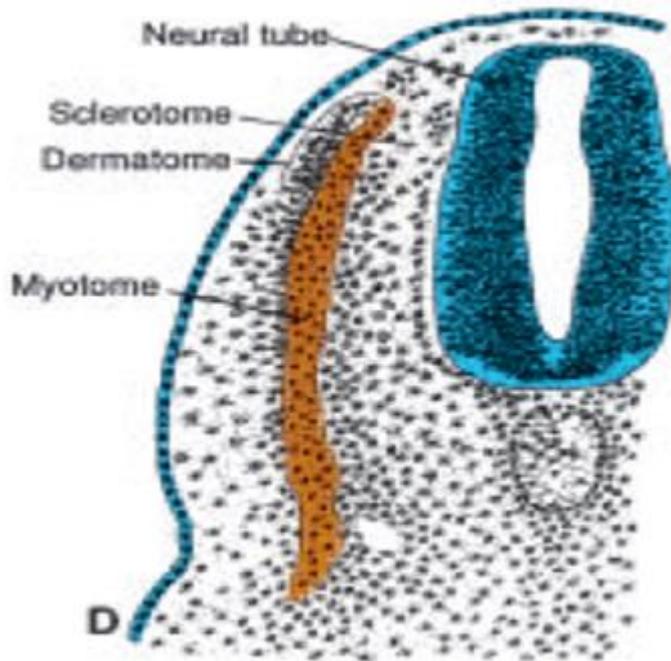
THE SCLEROTOME

They will
surround the
spinal cord and
notochord to form
**the
vertebral
column**



*The remaining dorsal
epithelium
forms the dermatome*

dermatomes form
the dermis and subcutaneous tissue of the skin



DERIVATIVES OF THE INTERMEDIATE MESODERM

It gives off:

1- Urine performing tubule (Kidney and ureter)

**2-internal genitalia in males and femals
(part of it not all)**

