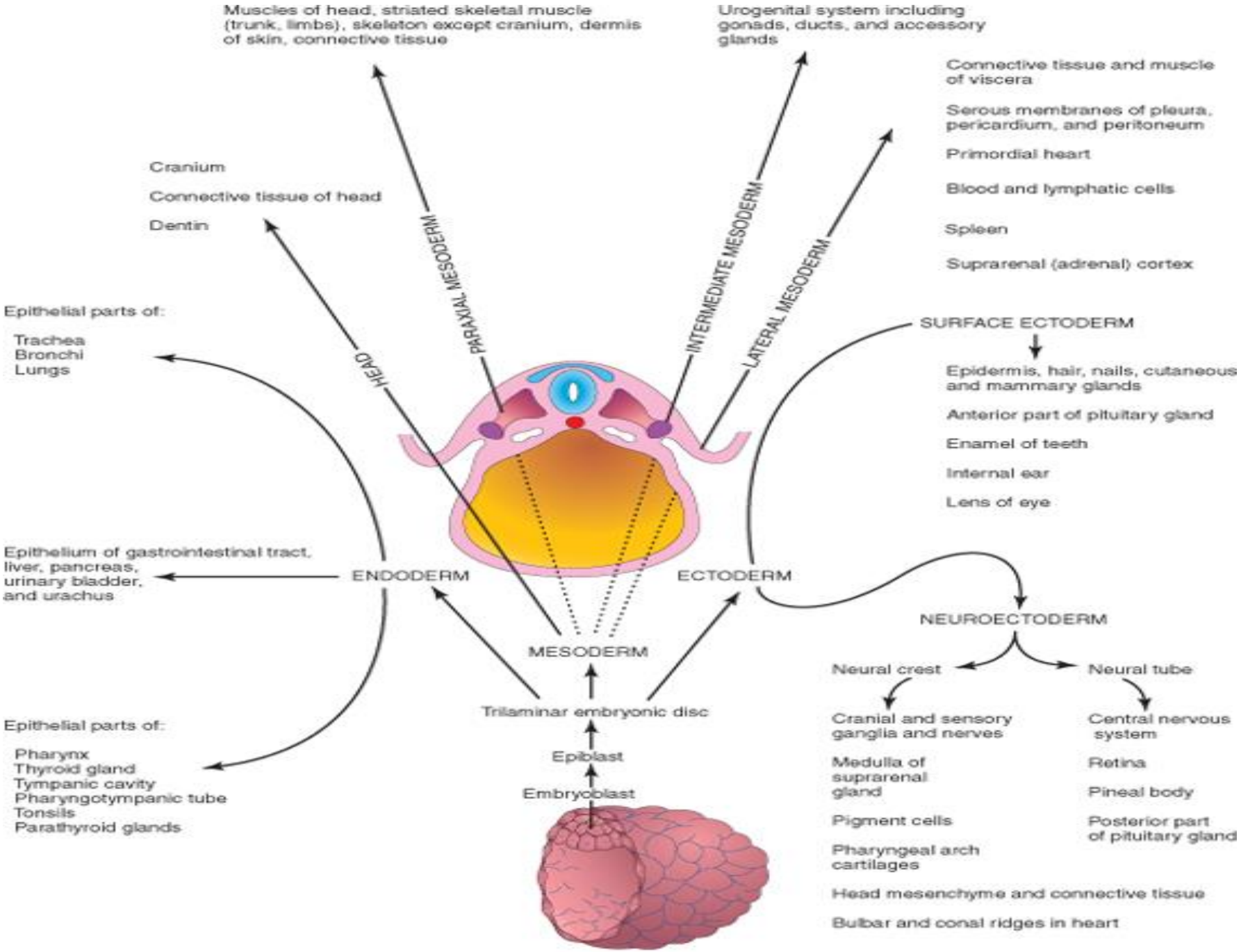
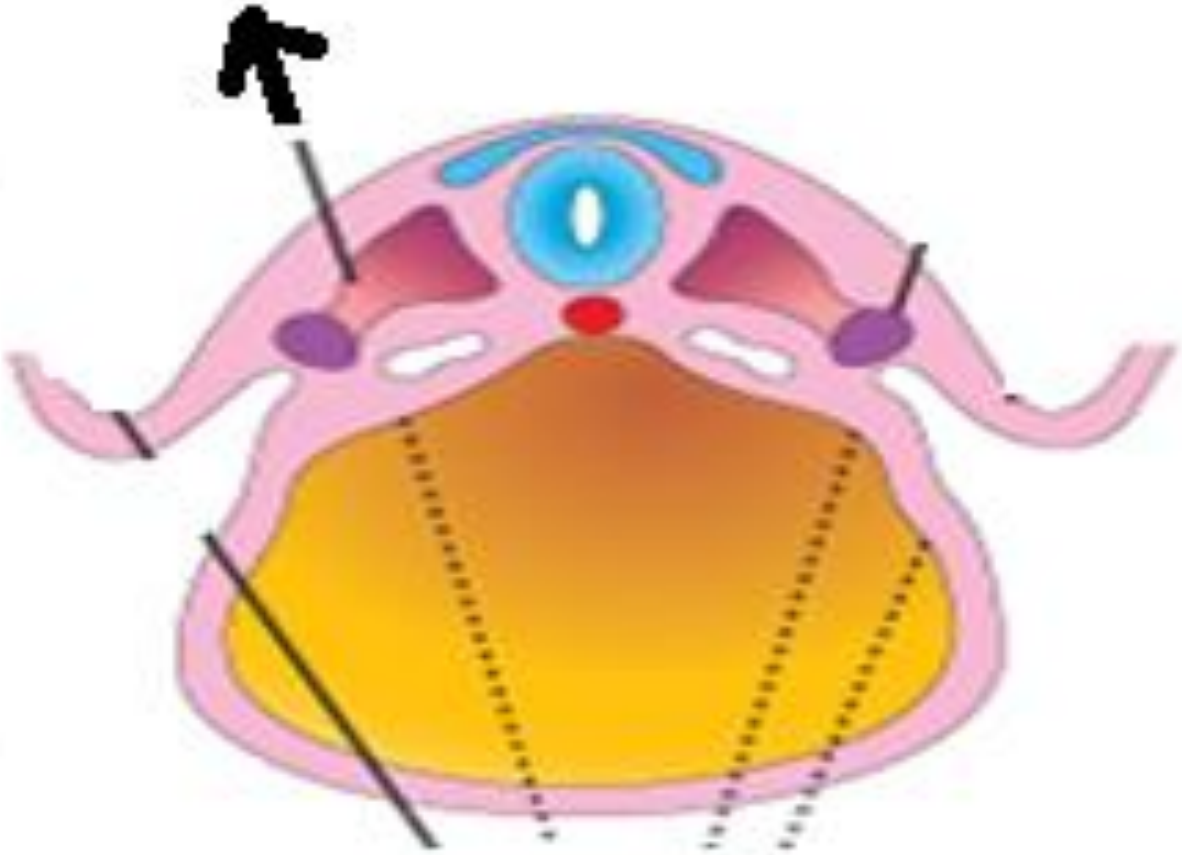

بسم الله الرحمن الرحيم


لا إله إلا الله محمد رسول الله



Muscle of head and limbs, skleton and dermis of skin



DEVELOPMENT OF SOMITES

Appears as a thick, longitudinal column of cells .

Each column is continuous laterally with the intermediate mesoderm, which gradually thins into a layer of lateral mesoderm.

Toward the end of the third week, the paraxial mesoderm differentiates, condenses, and begins to divide into paired cuboidal bodies,

the **somites**, which form in a craniocaudal sequence.

These blocks of mesoderm are located on each side of the developing neural tube. About **38** pairs of somites form during the somite period of human development (days 20 to 30).

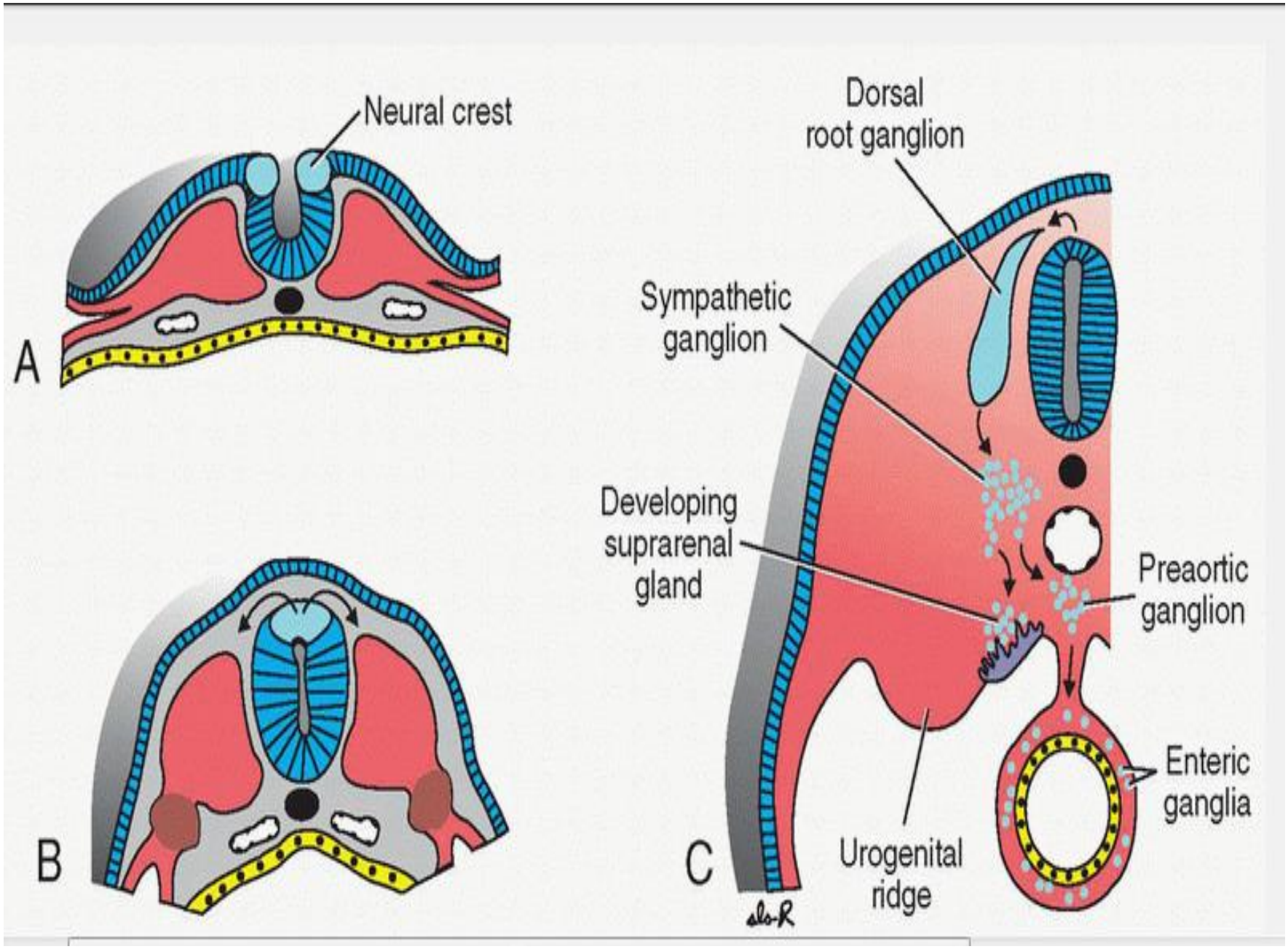
By the end of the fifth week, 42 to 44 pairs of somites are present.

The somites form distinct surface elevations on the embryo and are somewhat triangular in transverse section. Because the somites are so prominent during the fourth and fifth weeks, they are used as one of several criteria for determining an embryo's age.

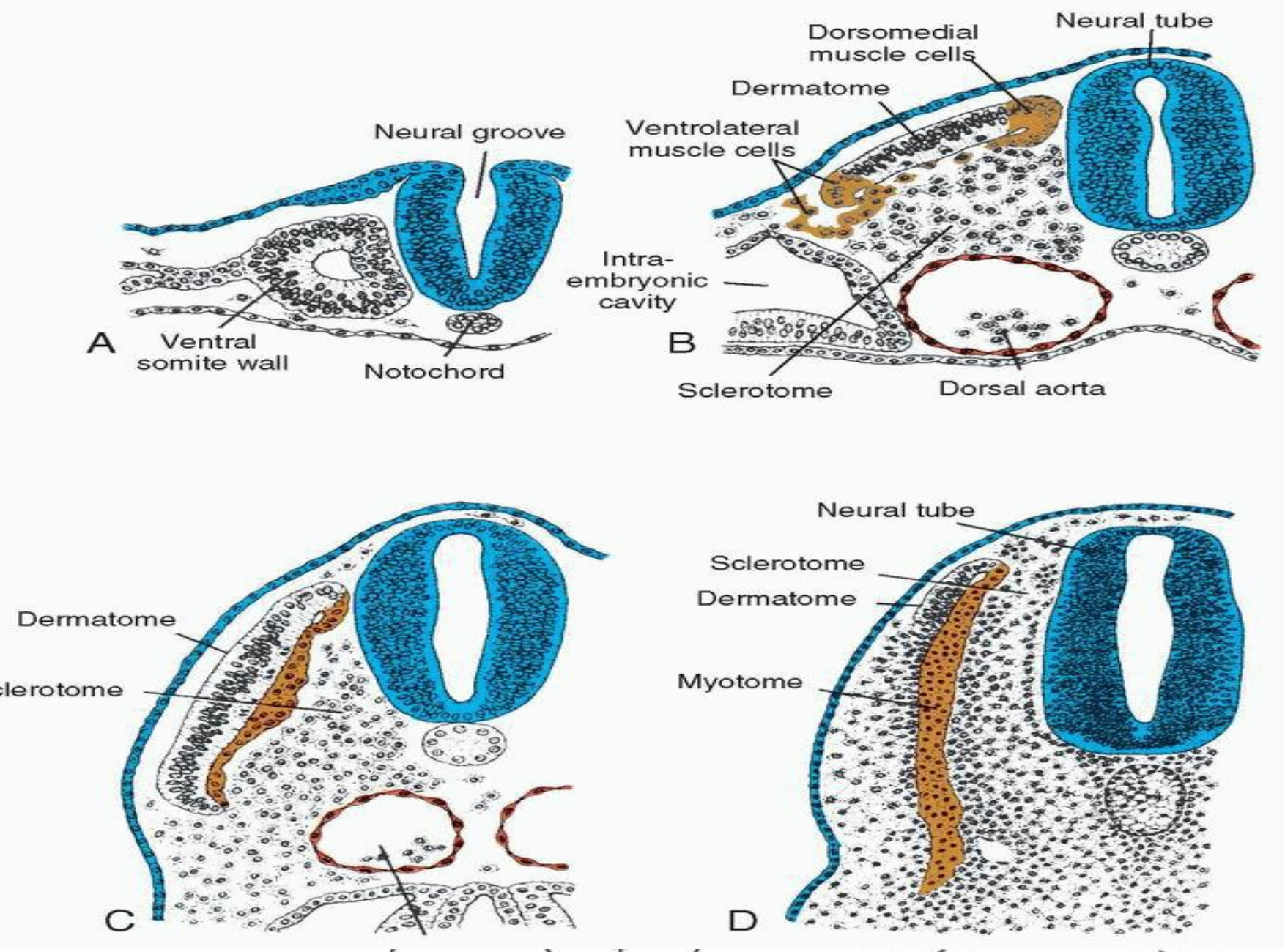
Somites first appear in the future occipital region of the embryo. They soon develop craniocaudally and give rise to most of the axial skeleton and associated musculature as well as to the adjacent dermis of the skin. The first pair of somites appears at the end of the third week a short distance caudal to the site at which the otic placode forms. Subsequent pairs form in a craniocaudal sequence.

Cranial somites are the oldest and caudal somites are the youngest.

Also, motor axons from the spinal cord innervate muscle cells in the somites, a process that requires the correct guidance of axons from the spinal cord to the appropriate target cells.


Neural crest
A
B
Dorsal
root ganglion
Sympathetic
ganglion
Developing
suprarenal
gland
Preaortic
ganglion
Enteric
ganglia
C
Urogenital
ridge

(trunk, limbs), skeleton except cranium, dermis gonads, ducts, and accessory



- **DERIVATIVES OF THE MESODERMAL GERM LAYER**

Form a thin sheet of loosely woven tissue on each side of the midline .

Paraxial mesoderm .

Laterally, the mesoderm called the lateral plate.

Divided into two layers:

Somatic or parietal mesoderm layer,

Splanchnic or visceral mesoderm layer .

Intermediate mesoderm connects paraxial and lateral plate mesoderm

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- From the occipital region caudally, somitomeres further organize into somites.
- The first pair of somites arises in the occipital region of the embryo at approximately the 20th day .
- From here, new somites appear in craniocaudal

Form at a rate of three pairs per day until, at the end of the fifth week, **42 to 44** pairs are present.

Occipital-------- 04

Cervical--------- 08

Thoracic------- 12

Lumbar-------- 05

Five sacral---- 05

Coccygeal pairs------08-10

First occipital and the last five to seven coccygeal somites later disappear,

Remaining somites form the axial skeleton.

- **Somite Differentiation**
- **Sclerotome** that will differentiate into the vertebrae and ribs .
- **Dermomyotome**
- Cells in the dermomyotome ultimately form
- dermis and muscles for the back, body wall, .

- **Each myotome and dermatome retains its innervation from its segment of origin, no matter where the cells migrate**

Hence, each somite forms its own

Sclerotome (the tendon cartilage and bone component),

Myotome (providing the segmental muscle component),

Dermatome, which forms the dermis of the back.

Each myotome and dermatome has its own segmental nerve component

- **Lateral Plate Mesoderm**

  Splits into

  Parietal (somatic)) layer

  Visceral (splanchnic) layer

The parietal layer of lateral plate mesoderm forms the dermis **and the bones and connective tissue of the limbs, and the sternum.**

Sclerotome and muscle precursor cells

migrate into the parietal layer of lateral plate mesoderm to form

- Costal cartilages,
- Muscles.
- **The visceral layer** of lateral plate mesoderm forms the wall of the gut tube.

Mesoderm cells of the parietal layer form membranes which will line the **peritoneal, pleural, and pericardial cavities .**

Mesoderm cells of the visceral layer form a thin **serous membrane around each organ .**

THANKS