# HEART STRUCTURE

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# PLAN

I. GENERAL OVERVIEW

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II. THE MYOCARDIUM

**III. THE ENDOCARDIUM** 

IV. THE PERICARDIUM

VI. CONCLUSION

V. CLINICAL APPLICATION



Lonaitudinal section through the ventricular cardiac muscle

## I-GENERAL OVERVIEW

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The cardiac wall consists of :

- A fibroserous envelope, the pericardium, which surrounds the heart.

A thick muscular layer, the myocardium.

 A membrane, the endocardium, which lines the inner surface of the myocardium and defines the heart's cavities.



## II-THE MYOCARDIUM

- A. THE FIBROUS FRAMEWORK OF HEART SKELETON,
- B. THE MUSCLE FIBERS,
- C. THE CONDUCTION SYSTEM OR EXCITATORY-CONDUCTIVE SYSTEM.

## Myocardium

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#### A-THE FIBROUS FRAMEWORK OR THE HEART SKELETON

It consists of four fibrous rings :

- Two atrio-ventricular fibrous rings, with :
- Auricular and ventricular borders.
- Their lateral border correspond the to the neighboring fibrous rings and the atrioventricular sulcus.
- Their medial border gives rise to an extension that extends from the valve and forms its fibrous framework.



#### A-THE FIBROUS FRAMEWORK OR THE HEART SKELETON

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- Two arterial rings :

Formed at each opening by three thickened areas (loops) of the wall, which correspond to the fibrous leaflet of the valve.



# **B-MUSCLE FIBERS**

1. THE FIBERS OF THE VENTRICLES

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2. THE FIBERS OF THE ATRIA





Direction of the myofibers of the superficial layer of the myocardium

The myocardium is composed of three

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muscular layers:

- Superficial,
- Middle,
- Deep.



The superficial layer consists of fibres common to both ventricles.

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Contraction of the

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- These fibres arise from the fibrous rings and trigones
- They terminate either within the interventricular septum or in the trabeculae carneae.
- The orientation of these bundles differs between ventricles.
- These common or unifying fibres envelop and connect the muscular sacs formed by the intrinsic fibres, extending from the fibrous rings toward the apex of the heart.



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 The middle layer, which is the thickest, contains arciform bundles specific to each ventricle, contributing to the chamber-specific contractile function.



• The deep layer, composed of fibres derived from the previous two layers, 1 gives rise to the trabeculae carneae and the papillary muscles.

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A summary

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The intrinsic fibres of the myocardium vary in their length and obliquity. 100

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- The longest fibres, with an orientation closer to the heart's axis, are found at the periphery.
- The shortest fibres form the

deepest layers of the myocardium.







Superficial layer of the myocardium (view from the base of the ventricles, with the atria removed).



Superficial layer of the myocardium at the apex.



Middle layer of the myocardium

#### 2-THE FIBERS OF THE ATRIA

- The musculature of the atria, which is thin, is also composed of intrinsic fibers and common fibers.

The intrinsic fibers are grouped into
two categories of bundles :

- Annular bundles surrounding the orifices.
- Ansiform bundles extending from the upper to the lower part of the fibrous ring.



Anterior view of the heart showing the arrangement of the myocardial fibers.

#### C-THE CONDUCTION OR ORY-CONDUCTIVE SYSTEM

- The heart contains a specialised muscular tissue known as the cardiac conduction system or cardionector system,
- It spontaneously and rhythmically generates local impulses.
- These impulses are transmitted over distance, stimulating the remainder of the myocardium and triggering its contraction.

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This specialised network of muscle bundles and neural elements ensures the coordinated propagation of myocardial contraction. 



#### **III-THE ENDOCARDIUM**

- The endocardium is a thin, smooth, and adherent membrane that lines the interior of the heart.
- It is continuous with the inner lining of the blood vessels (the endothelium).

 It contains no blood vessels of its own and is nourished by the blood flowing over its surface.

#### Endocardium

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## IV-THE PERICARDIUM

It is represented by a fibrous-serous
 sac that encloses the heart

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A summary

- It consists of two components:
- o an outer fibrous layer,
- o and a deeper serous layer.



Longitudinal section of the heart showing the arrangement of the pericardium.

# V- CLINICAL APPLICATIONS

• A weakened heart muscle may lead to rapid heart rate, the presence of fluid in the lungs, thickening of the heart wall and swelling of the lower limbs.

• These symptoms are oftend associated with congestive heart failure.



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# VI-CONCLUSION

- The heart is a specialised organ whose structure ensures efficient pumping.
- Its myocardial layers enable strong, rhythmic contractions, while the endocardium allows smooth blood flow.
- The fibrous skeleton gives support, and the conduction system ensures a well-coordinated heartbeat.
- Together, these elements keep blood circulating effectively throughout the body.

