Corium or Dermis

The skin consists of two layers: The outer layer – epidermis - and the inner layer – dermis.

Epidermis

The outermost layer of the skin is formed by a multi-layered sheet of cells that become flattened and packed with the protein keratin as they near the skin surface. Bones require their own blood supply which travels through the periosteum to the inner bone marrow. This holds true for all bones. The coffin bone is the exception to this rule. This bone is covered by a corium. (The coffin bone also has a periosteum closer to the bone, but this periosteum does not exhibit the usual reactions of periosteum on other bones).

Dermis / Corium

This thick felt work of collagen, blood vessels and nerves underlies the epidermis of the hoof capsule. Within the hoof capsule, it is referred to as the **corium**.

It contains the blood vessels that supply the cells of the epidermis, including those that form the hoof capsule, as well as nerve endings which provide the various sensations and control of blood flow.
Within the hoof capsule different regions of corium are named according to the parts of the hoof capsule that they underlie.

Note: Corium produces horn

UNO ALLA VOLTA — ONE AT A TIME

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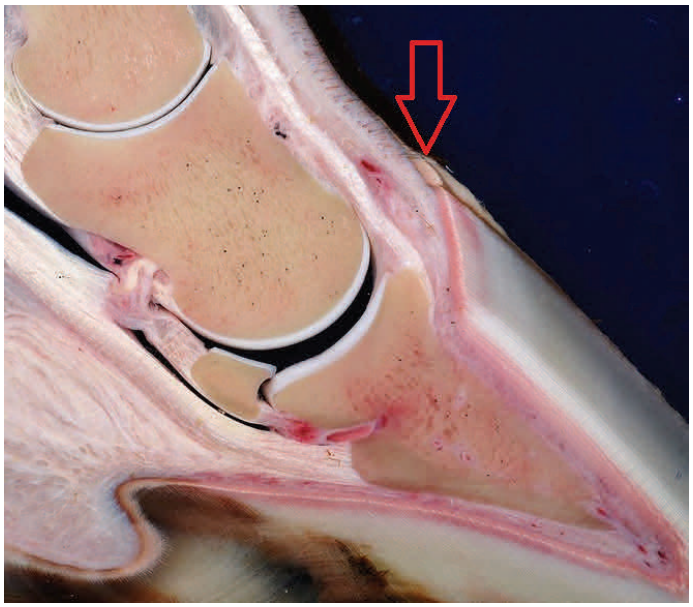
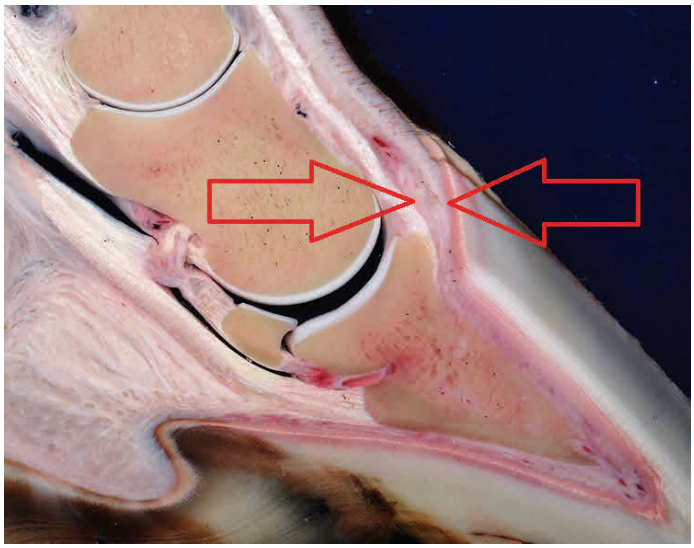
Perioplic corium

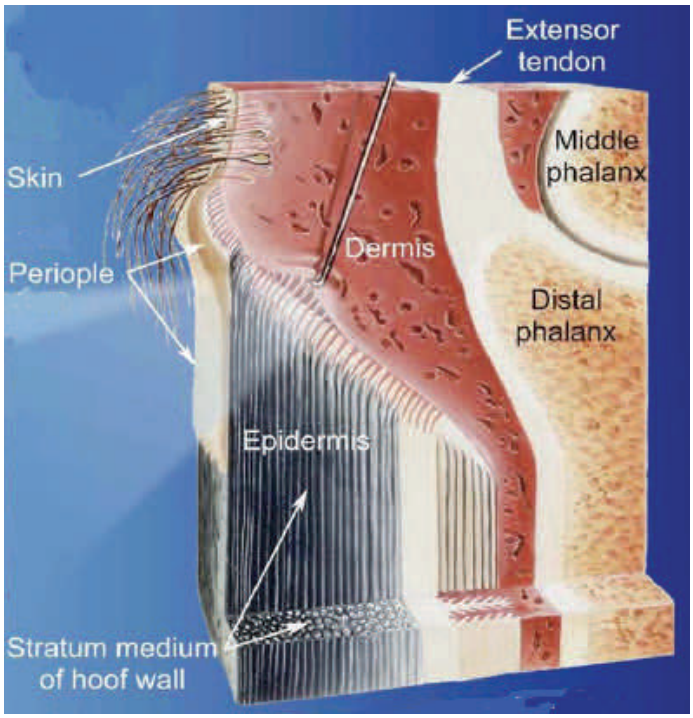
The perioplic corium lies between the hair bearing skin and the coronary bulge. It produces the periople, a layer of very soft horn.
The periople is capable of storing water and prevents the coronary corium from drying out. In the area of the heels the perioplic corium merges with the bulb.



Coronary Corium

The coronary corium produces the hoof wall including the bars (the part of the wall bent inward from the heels). The surface of the coronary corium contains many papillae which produce around themselves a very hard horn substance—the horn tubules. These hard horn tubules are pushed downward as a result of constant production of horn. The number of papillae is the same for all horses. In smaller hooves, which are usually also harder, the papillae are packed closer together.





The surface of the coronary corium between the papillae produces a soft connective horn which glues the hard horn tubules together.
The coronary corium sits at the top edge of the hoof.
Just inside the hoof capsule it forms a bulge around the perimeter of the hoof. In the bulb/heel area it bends sharply inward and borders the outside of the frog for half of its length, thus creating the bars.

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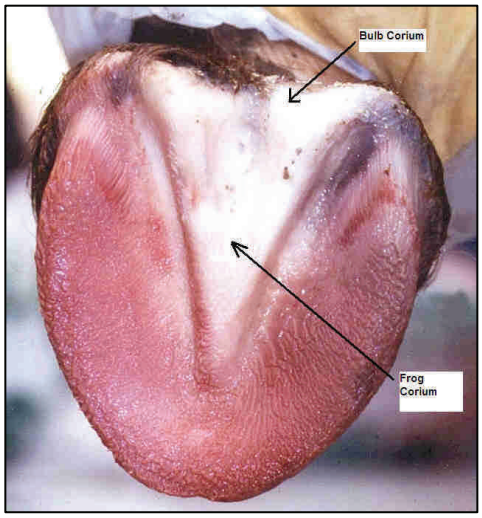
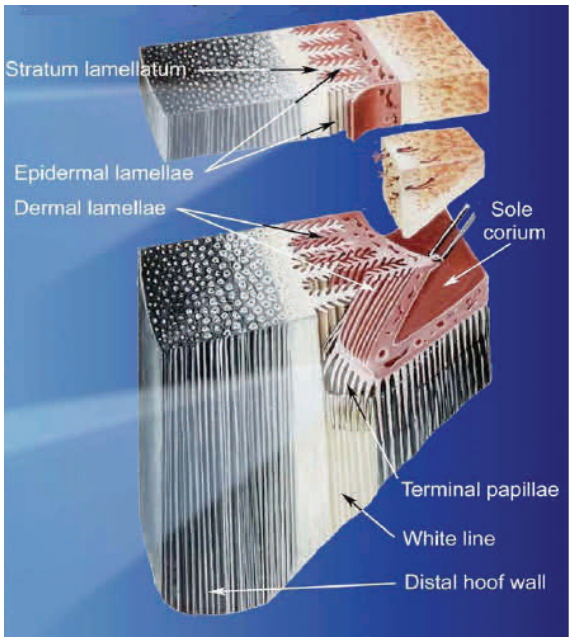
Frog and Bulb Corium

The corium of the frog and bulb produce soft, elastic horn which contains a large amount of water. To prevent it from drying out too much, there is a line of sweat glands between the frog corium and the solar corium where it parallels the frog.



The Lamellae Corium

The laminae, called lamellae by British and Australian hoof researchers, suspend the coffin bone within the hoof wall. There are two interconnected layers, commonly called dermal (picture right top) and epidermal laminae that work together to keep the coffin bone in its normal position. The epidermal layer (picture right bottom) lines the inside of the hoof capsule and can be seen on the inner hoof wall in a specimen of an empty hoof capsule. The dermal layer, which wraps around the coffin bone and the rest of the inner foot, can be seen on a specimen freshly separated from its hoof capsule. The dermal layer houses the blood and nerve supply of the hoof, while the epidermal layer is composed of horn and has no blood supply or nerves.



Researchers have investigated the spacing and orientation of the laminae. Studies have shown that laminae are closer together at the toe than in the quarters.

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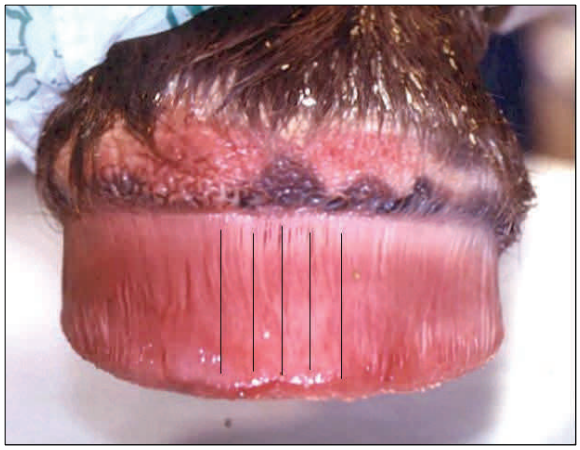
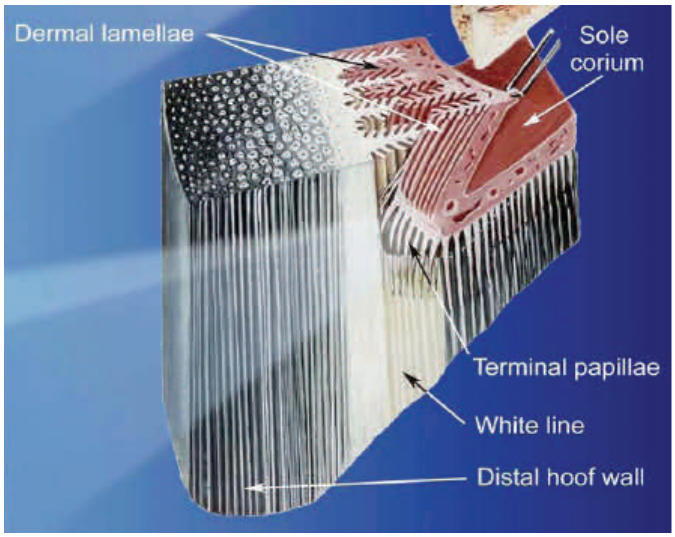
The laminae in the toe are aligned perpendicular to the wall at the toe (left), and run at an oblique angle at the quarters (right).

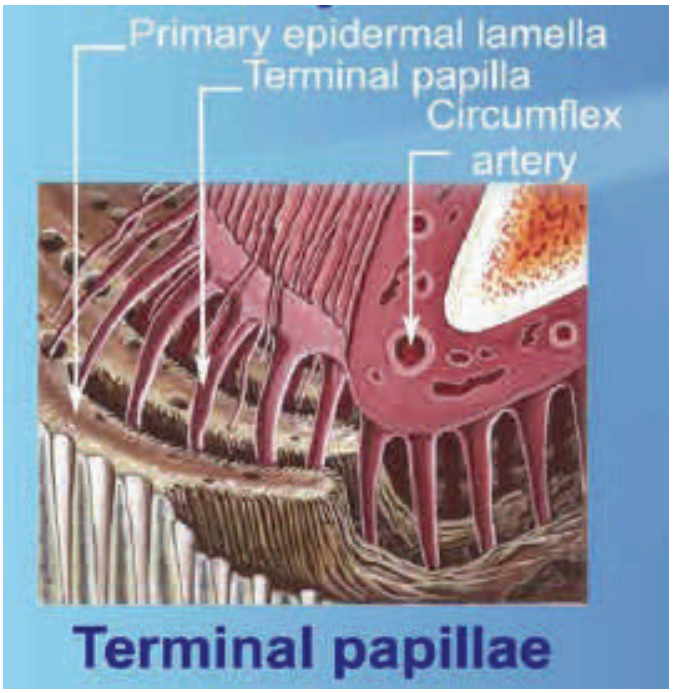


Terminal Papillae

As in the coronet, each dermal papilla of the sole corium fits into the socket in the epidermal (horn) sole. At the distal end of each dermal lamella is a set of papillae known as the terminal papillae.



The epidermis surrounding the terminal papillae is non-pigmented and forms the inner part of the white line. The white line is relatively soft and flexible and effectively seals the sole to the hoof wall.



Dr. Chris Pollitt, University of Queensland, Australia is one of the foremost researchers about laminitis. He has graciously allowed us to share some of his work in this course.

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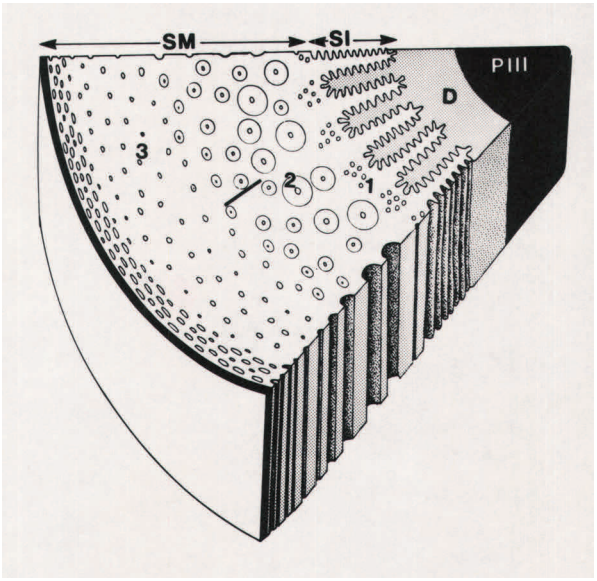
Further pictures to explain the connection between coffin bone and hoof wall

Right: Schematic diagram of a cross section through the third phalanx (PIII), dermis (D) and hoof wall. S1 - stratum internum;
SM - stratum medium;
I - inner tubule type;
2 - second tubule type;
3 - third tubule type;
bar - intermediate zone.
(Redrawn from Stump, 1967).



From the Glass Horse—The Equine Distal Limb: