

ENAMEL

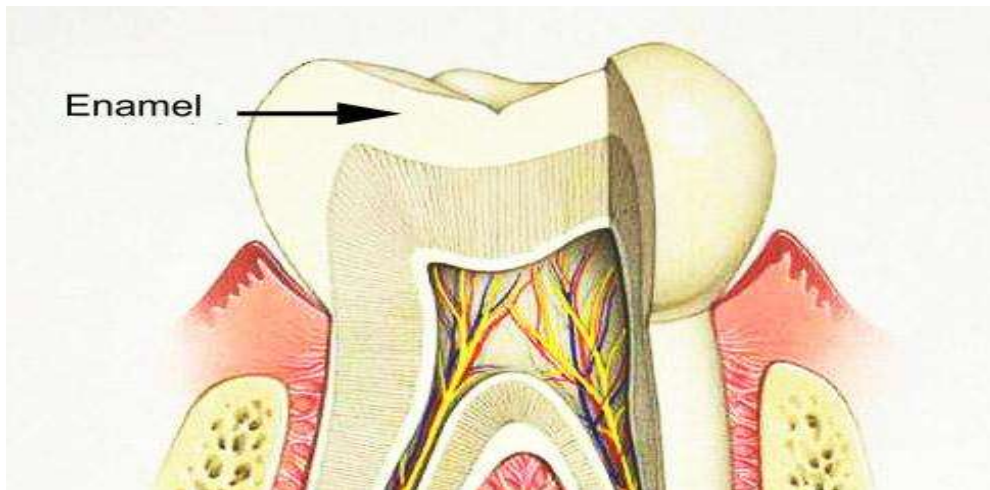
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Abstract: Tooth enamel is a tissue that is located on top of the dentin, covering the crown of the tooth and its neck. The enamel thickness of permanent teeth averages two to three millimeters: the enamel layer is thickest on the chewing bumps, and thinner on the side surfaces. The thickness of the enamel of baby teeth does not exceed 1 mm.

Key words: Enamel, tooth, surfaces.

Enamel (enamelum) is the hardest tissue of the human body (250-390 units. Vickers, up to 800 units!). The surface layers of enamel have the highest hardness, but at the same time they are quite fragile. The closer the enamel is to the dentinoenamel boundary, the lower its hardness and, accordingly, the lower its brittleness. The thickness of the enamel layer in different parts of the crown is not the same, it is 1.5-1.7 mm. at the level of the chewing tubercles, it gradually decreases on the lateral surfaces, and disappears in the area of the neck of the tooth (only 0.01 mm.).



Enamel prisms are the main structural formation of enamel, their diameter is only 4-6 microns, but due to their sinuous shape, the length of the prism exceeds the thickness of the enamel. Enamel prisms, gathering in bundles, form s-shaped bends. Due to this, dark and light stripes are found on the enamel sections: in one section the prisms are cut off in the longitudinal direction, and in the other – in the transverse direction (Hunter-Schrager stripes). On the enamel sections, you can notice lines running in an oblique direction and reaching the enamel surface - these are Retzius lines, they are especially clearly visible when processing enamel with acid. Their

formation is associated with the cyclical mineralization of enamel during its formation. And it is precisely in these areas that mineralization is less pronounced, therefore, when etched with acid, the earliest and most pronounced changes occur in the Retzius lines.

The enamel prism has a transverse striation, which reflects the daily rhythm of the deposition of mineral salts. In cross-section, the enamel prism has an arcaded shape or resembles scales in shape, but can be rounded, hexagonal or polygonal. It should be noted that dental veneers are best fixed to the enamel. The interprismal substance of enamel consists of the same crystals as the prism itself, but differs in their orientation. The organic matter of enamel has the appearance of the thinnest fibrillar structures, which, according to existing opinion, determine the orientation of the crystals of the enamel prism. There are formations such as plates, bundles and spindles in the enamel of the tooth. The lamellae (also called lamellae) penetrate into the enamel to a considerable depth, the bundles to a lesser depth, the spindles (processes of odontoblasts) enter the enamel through a dentinoemal connection. The smallest structural unit of enamel is an apatite-like substance that forms enamel prisms. In the section, these crystals have a hexagonal shape, from the side they look like small rods. Enamel crystals are the largest crystals of human hard tissues. Their length is 160nm, width is 40-70nm, and thickness is 26nm. The crystals in the enamel prism fit tightly to each other, the space between them does not exceed 2-3 nm, in the core of the prism the crystals are directed parallel to the axis of the prism. In the interprism substance, the crystals are less ordered and directed perpendicular to the axis of the enamel prism. Each crystal has a hydrate shell with a thickness of 1nm. and is surrounded by a layer of proteins and lipids.

References:

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