

## = Stapes =

The stapes / ˈsteɪpiːz / or stirrup is a bone in the middle ear of humans and other mammals which is involved in the conduction of sound vibrations to the inner ear . The stirrup @-@ shaped small bone is on and transmits these to the oval window , medially . The stapes is the smallest and lightest named bone in the human body , and is so @-@ called because of its resemblance to a stirrup ( Latin : Stapes ) .

## = = Structure = =

The stapes is the third bone of the three ossicles in the middle ear . The stapes is a stirrup @-@ shaped bone , and the smallest in the human body . It rests on the oval window , to which it is connected by an annular ligament . The stapes is described as having a base , resting on the oval window , as well as a head that articulates with the incus . These are connected by anterior and posterior limbs ( Latin : crura ) . The stapes articulates with the incus through the incudostapedial joint . The stapes is the smallest bone in the human body , and measures roughly 3 x 2.5mm , greater along the head @-@ base span .

## = = = Development = = =

The stapes develops from the second pharyngeal arch during the sixth to eighth week of embryological life . The central cavity of the stapedius is due to the presence embryologically of the stapedial artery , which later regresses .

## = = = Animals = = =

The stapes is one of three ossicles in mammals . In non @-@ mammalian four @-@ legged animals , the bone homologous to the stapes is usually called the columella ; however , in reptiles , either term may be used . In fish , the homologous bone is called the hyomandibular , and is part of the gill arch supporting either the spiracle or the jaw , depending on the species . The equivalent term in amphibians is the pars media plectra .

## = = = Variation = = =

The stapes appears to be relatively constant in size in different ethnic groups . In 0 @. 01 @-@ 0 @. 02 % of people , the stapedial artery does not regress , and persists in the central foramen . In this case , a pulsatile sound may be heard in the affected ear , or there may be no symptoms at all . Rarely , the stapes may be completely absent .

## = = Function = =

Situated between the incus and the inner ear , the stapes transmits sound vibrations from the incus to the oval window , a membrane @-@ covered opening to the inner ear . The stapes is also stabilized by the stapedius muscle , which is innervated by the facial nerve .

## = = Clinical relevance = =

Otosclerosis is a congenital or spontaneous @-@ onset disease characterized by abnormal bone remodeling in the inner ear . Often this causes the stapes to adhere to the oval window , which impedes its ability to conduct sound , and is a cause of conductive hearing loss . Clinical otosclerosis is found in about 1 % of people , although it is more common in forms that do not cause noticeable hearing loss . Otosclerosis is more likely in young age groups , and females . Two common treatments are stapedectomy , the surgical removal of the stapes and replacement with an

artificial prosthesis , and stapedotomy , the creation of a small hole in the base of the stapes followed by the insertion of an artificial prosthesis into that hole . Surgery may be complicated by a persistent stapedia artery , fibrosis @-@ related damage to the base of the bone , or obliterative otosclerosis , resulting in obliteration of the base .

= = History = =

The stapes is commonly described as having been discovered by the professor Giovanni Filippo Ingrassia in 1546 at the University of Naples , although this remains the nature of some controversy , as Ingrassia 's description was published posthumously in his 1603 anatomical commentary *In Galeni librum de ossibus doctissima et expectatissima commentaria* . Spanish anatomist Pedro Jimeno is first to have been credited with a published description , in *Dialogus de re medica* ( 1549 ) . The bone is so @-@ named because of its resemblance to a stirrup ( Latin : stapes ) , an example of a late Latin word , probably created in mediaeval times from " to stand " ( Latin : stapia ) , as stirrups did not exist in the early Latin @-@ speaking world .