Ose Ogheneruona

18/MHS03/013

Anatomy

Ana 212

Discuss the anal canal

**ANAL CANAL**

The **anal canal** is the terminal segment of the [large intestine](https://en.m.wikipedia.org/wiki/Large_intestine%22%20%5Co%20%22Large%20intestine) between the [rectum](https://en.m.wikipedia.org/wiki/Rectum%22%20%5Co%20%22Rectum) and [anus](https://en.m.wikipedia.org/wiki/Anus%22%20%5Co%20%22Anus), located below the level of the [pelvic diaphragm](https://en.m.wikipedia.org/wiki/Pelvic_diaphragm%22%20%5Co%20%22Pelvic%20diaphragm). It is located within the [anal triangle](https://en.m.wikipedia.org/wiki/Anal_triangle%22%20%5Co%20%22Anal%20triangle) of [perineum](https://en.m.wikipedia.org/wiki/Perineum%22%20%5Co%20%22Perineum), between the right and left [ischioanal fossa](https://en.m.wikipedia.org/wiki/Ischioanal_fossa%22%20%5Co%20%22Ischioanal%20fossa). As the final functional segment of the bowel, it functions to regulate release of excrement by two muscular sphincter complexes. The aperture at the terminal portion of the anal canal is known as the anus.

## **Structure**

In humans, the anal canal is approximately 2.5" to 4" long, from the anorectal junction to the [anus](https://en.m.wikipedia.org/wiki/Anus%22%20%5Co%20%22Anus). It is directed downwards and backwards. It is surrounded by inner involuntary and outer voluntary sphincters which keep the [lumen](https://en.m.wikipedia.org/wiki/Lumen_%28anatomy%29%22%20%5Co%20%22Lumen%20%28anatomy%29) closed in the form of an anteroposterior slit.

The canal is differentiated from the rectum by a transition along the internal surface from [endodermal](https://en.m.wikipedia.org/wiki/Endodermal%22%20%5Co%20%22Endodermal) to skin-like [ectodermal](https://en.m.wikipedia.org/wiki/Ectodermal%22%20%5Co%20%22Ectodermal) tissue.

Anal canal is traditionally divided into two segments, upper and lower, separated by the [pectinate line](https://en.m.wikipedia.org/wiki/Pectinate_line%22%20%5Co%20%22Pectinate%20line) (also known as the dentate line):

* **upper zone** (zona columnaris)
	+ mucosa is lined by [simple columnar epithelium](https://en.m.wikipedia.org/wiki/Simple_columnar_epithelium%22%20%5Co%20%22Simple%20columnar%20epithelium)
	+ features longitudinal folds or elevations of tunica mucosa which are joined together inferiorly by folds of [mucous membrane](https://en.m.wikipedia.org/wiki/Mucous_membrane%22%20%5Co%20%22Mucous%20membrane) known as anal valves
	+ supplied by the [superior rectal artery](https://en.m.wikipedia.org/wiki/Superior_rectal_artery%22%20%5Co%20%22Superior%20rectal%20artery) (a branch of the [inferior mesenteric artery](https://en.m.wikipedia.org/wiki/Inferior_mesenteric_artery%22%20%5Co%20%22Inferior%20mesenteric%20artery))
* **lower zone**
	+ divided into two smaller zones, separated by a white line known [Hilton's line](https://en.m.wikipedia.org/wiki/Intersphincteric_groove%22%20%5Co%20%22Intersphincteric%20groove):
		- zona haemorrhagic - lined by [stratified squamous non-keratinized](https://en.m.wikipedia.org/wiki/Stratified_squamous_epithelium%22%20%5Co%20%22Stratified%20squamous%20epithelium) epithelium
		- zona cutanea - lined [stratified squamous keratinized](https://en.m.wikipedia.org/wiki/Stratified_squamous_epithelium%22%20%5Co%20%22Stratified%20squamous%20epithelium) epithelium, which blends with the surrounding perianal skin
	+ supplied by the [inferior rectal artery](https://en.m.wikipedia.org/wiki/Inferior_rectal_artery%22%20%5Co%20%22Inferior%20rectal%20artery) (a branch of the [internal pudendal artery](https://en.m.wikipedia.org/wiki/Internal_pudendal_artery%22%20%5Co%20%22Internal%20pudendal%20artery))

The analverge referes to the [distal](https://en.m.wikipedia.org/wiki/Anatomical_terms_of_location%22%20%5Cl%20%22Proximal_and_distal%22%20%5Co%20%22Anatomical%20terms%20of%20location) end of the anal canal, a transitional zone between the epithelium of the anal canal and the [perianal skin](https://en.m.wikipedia.org/wiki/Perianal_skin%22%20%5Co%20%22Perianal%20skin). It should not be confused with the [pectinate line](https://en.m.wikipedia.org/wiki/Pectinate_line%22%20%5Co%20%22Pectinate%20line) between the upper and lower zones within the anal canal.

[Anal gland](https://en.m.wikipedia.org/wiki/Anal_gland%22%20%5Co%20%22Anal%20gland) secretes lymphal discharge and built up faecal matter from the colon lining. In some animals this gland expungement can be done routinely every 24 – 36 months to prevent infection and fistula formation.

### **Relations**

* The [ischioanal fossa](https://en.m.wikipedia.org/wiki/Ischioanal_fossa%22%20%5Co%20%22Ischioanal%20fossa) are on each side of the anal canal.
* The [perianal space](https://en.m.wikipedia.org/w/index.php?title=Perianal_space&action=edit&redlink=1" \o "Perianal space (page does not exist)) surrounds the anal canal below the white line.
* The sub mucous space of the canal lies above the white line between the mucous membrane and [internal anal sphincter muscle](https://en.m.wikipedia.org/wiki/Internal_anal_sphincter_muscle%22%20%5Co%20%22Internal%20anal%20sphincter%20muscle).

## **Function**

The external anal sphincter muscle is the voluntary muscle that surrounds and adheres to the anus at the lower margin of the anal canal. This muscle is in a state of tonic contraction, but during defecation, it relaxes to allow the release of faeces.

Movement of the faeces is also controlled by the involuntarily controlled internal anal sphincter which is an extension of the circular muscle surrounding the anal canal. It relaxes to expel faeces from the rectum and anal canal.