

# Digital Necropsy of a Bottlenose Dolphin

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Oceanography 251-200



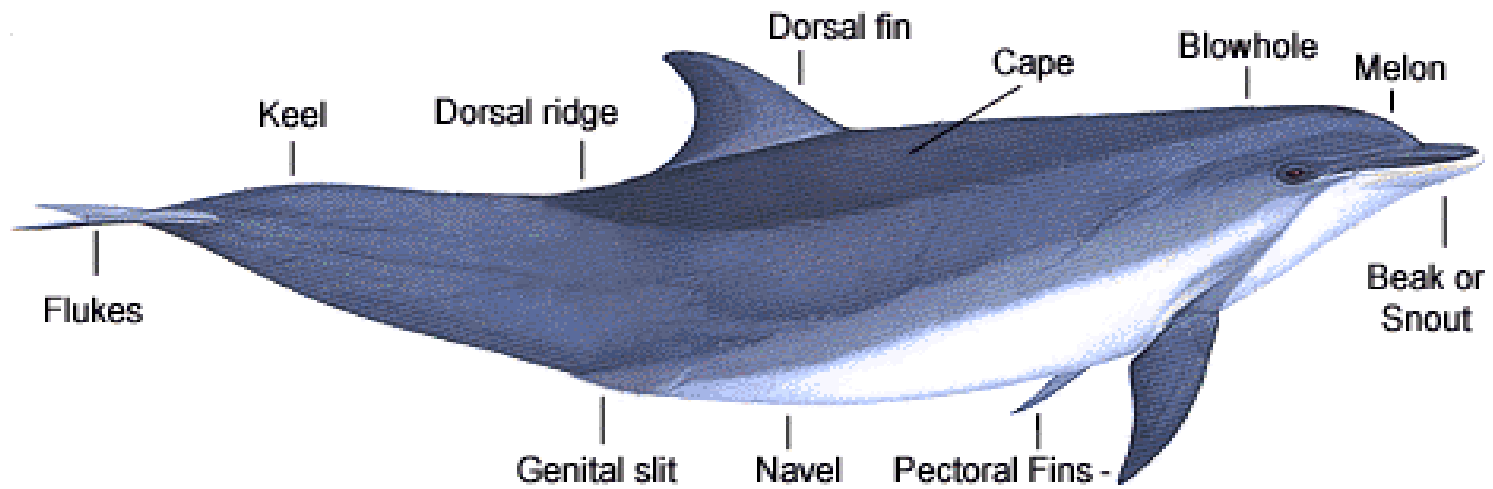
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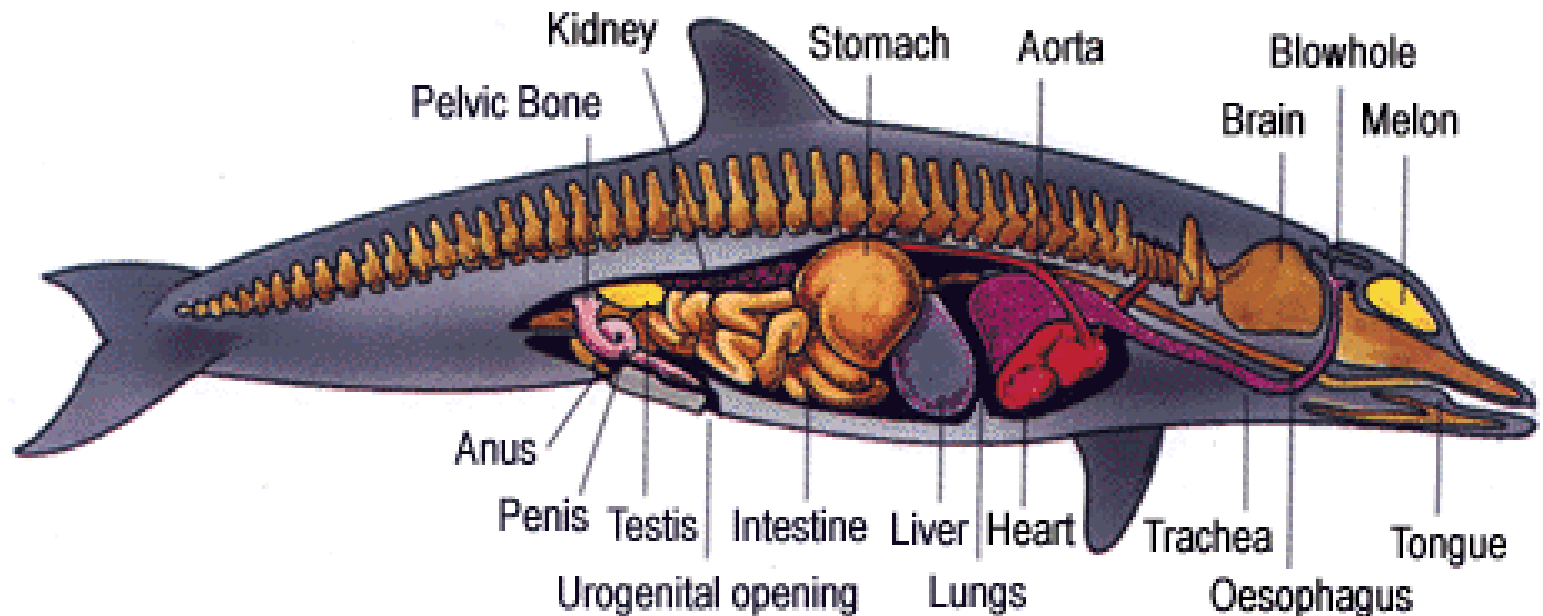


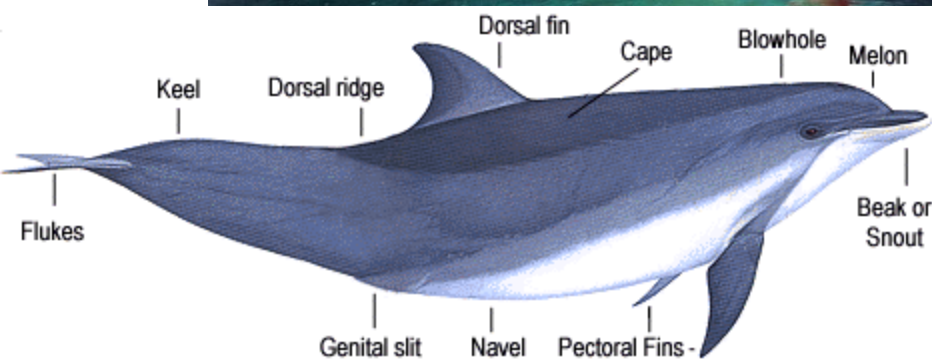
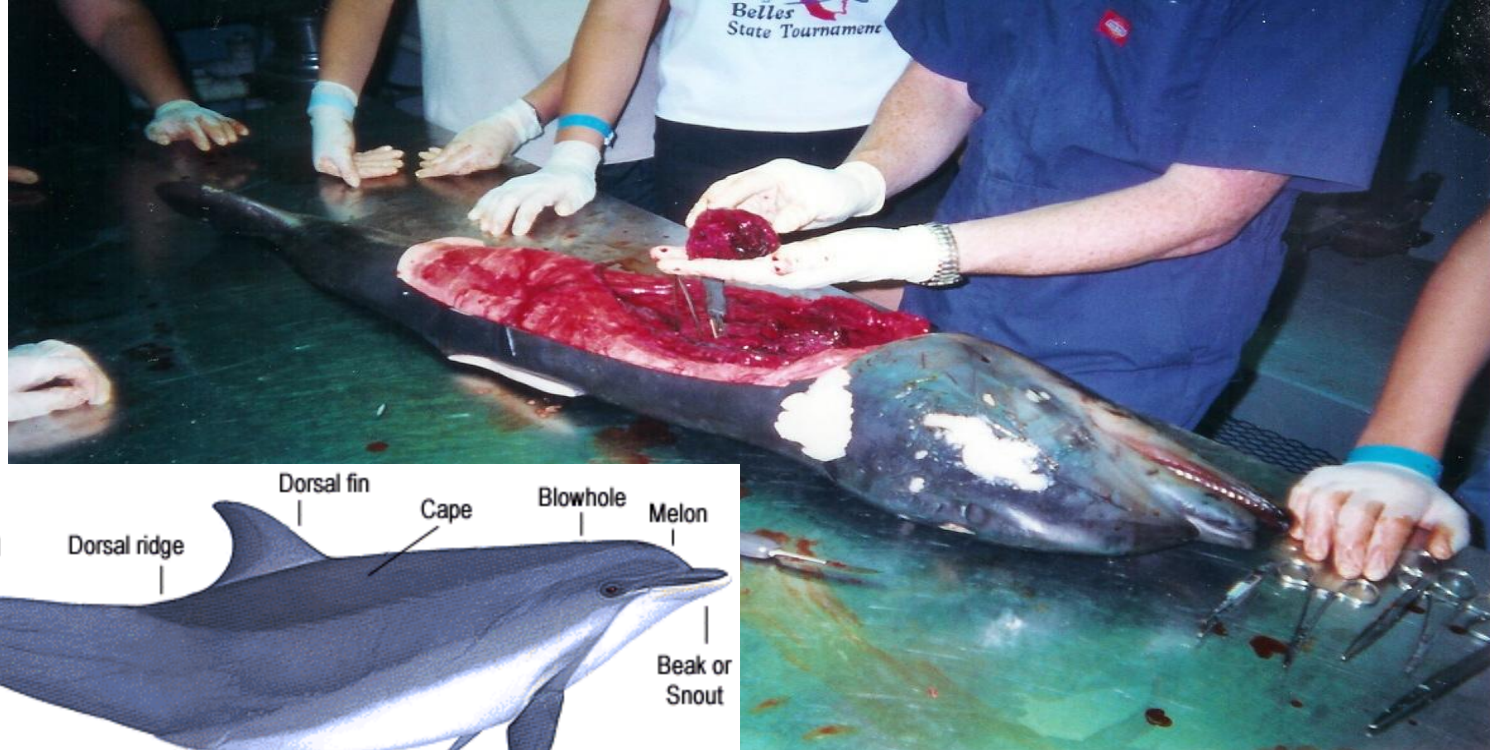
**1-800-9MAMMAL**

The necropsy shown in this presentation was performed in Galveston at the headquarters for the Texas Marine Mammal Stranding Network. TMMSN is a network of volunteers who rescue stranded marine mammals along the Texas Coast. If the animal is still alive, it is rehabilitated, and if possible, released back into the wild. Unfortunately, most animals found are already dead, in which case, a necropsy is performed to determine the cause of death in hopes of preventing future strandings. The man leading this dissection is Lance, and he is one of the only paid employees of TMMSN.



The top picture shows the external features of a dolphin, while the bottom picture shows its internal anatomy. These pictures can serve as a reference to the positions of the organs that will be discussed during the necropsy.





## Streamlining

This picture of the external features of a dolphin also shows their well-designed, streamlined bodies. All cetaceans have a smooth, tear-shaped body that is propelled through the water by horizontal tail flukes, as well as fore flippers and a dorsal fin. Streamlining has made these animals faster by limiting the drag caused by water flowing over their bodies. The dolphin that is being dissected in the pictures was still a baby when it stranded. Full grown adult bottlenose dolphins can be anywhere from 6 to 12 feet long.



## Heart

The organ in Lance's hands is the dolphin's heart. Because cetaceans actually evolved from terrestrial mammals, certain aspects of their anatomy more closely resemble humans than fish. For example, a dolphin's heart has four chambers and supplies oxygenated blood to both the lungs and the body. This is an important distinction between cetaceans and fish, which have a two-chambered heart and only a single circuit of blood flow. When they dive, dolphins can slow their heartbeat, and simultaneously, their blood flows away from non-essential organs and towards the most important ones, like the heart and brain. This enables them to conserve oxygen and stay under water for longer periods of time.



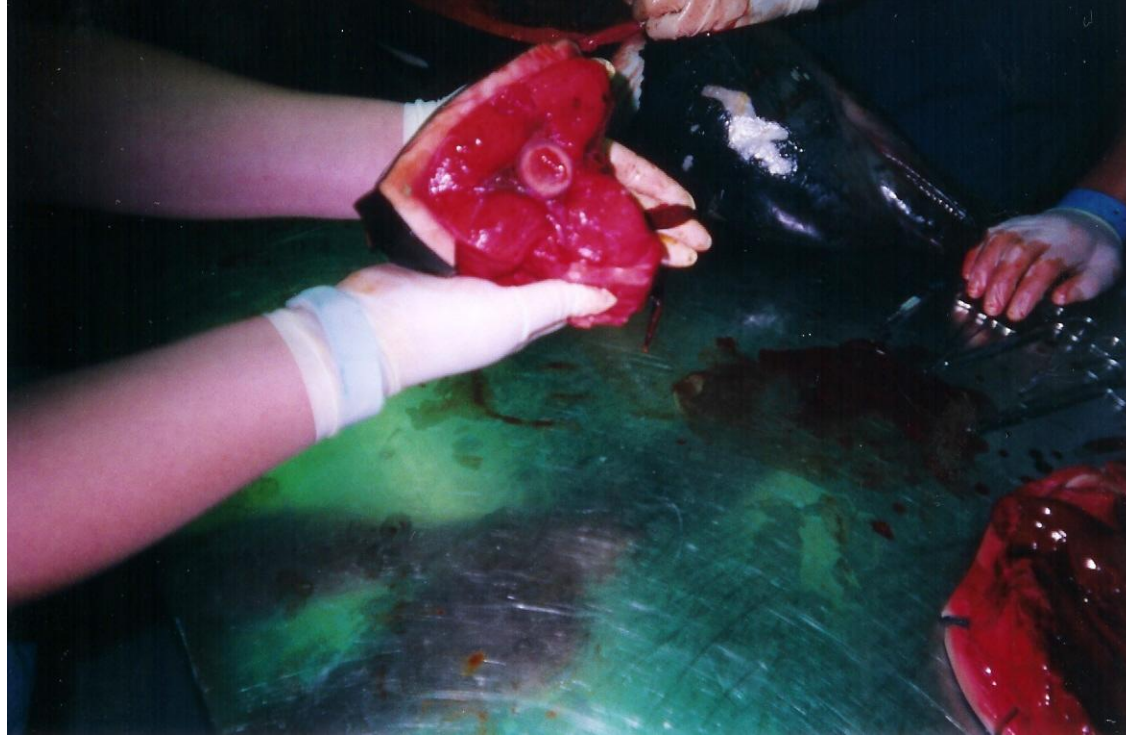
In this slide, Lance is holding the left and right ventricles of the heart of a young adult sperm whale. This helps illustrate the variety of creatures found in the Cetacean Order. Both the sperm whale and the bottlenose dolphin are toothed whales within the Order Cetacea, and both have many anatomic similarities, such as a four chambered heart. However, the sizes and shapes in which their similar anatomies appear are very diverse.



## **Stomach and Intestines**

Cetacean stomachs also have chambers. They usually have three: a large fore-stomach, the main stomach, and a smaller duodenum. The duodenum is actually the first section of the small intestine, which is the step in the digestive system that follows the stomach. Lance is holding the dolphin's intestines.





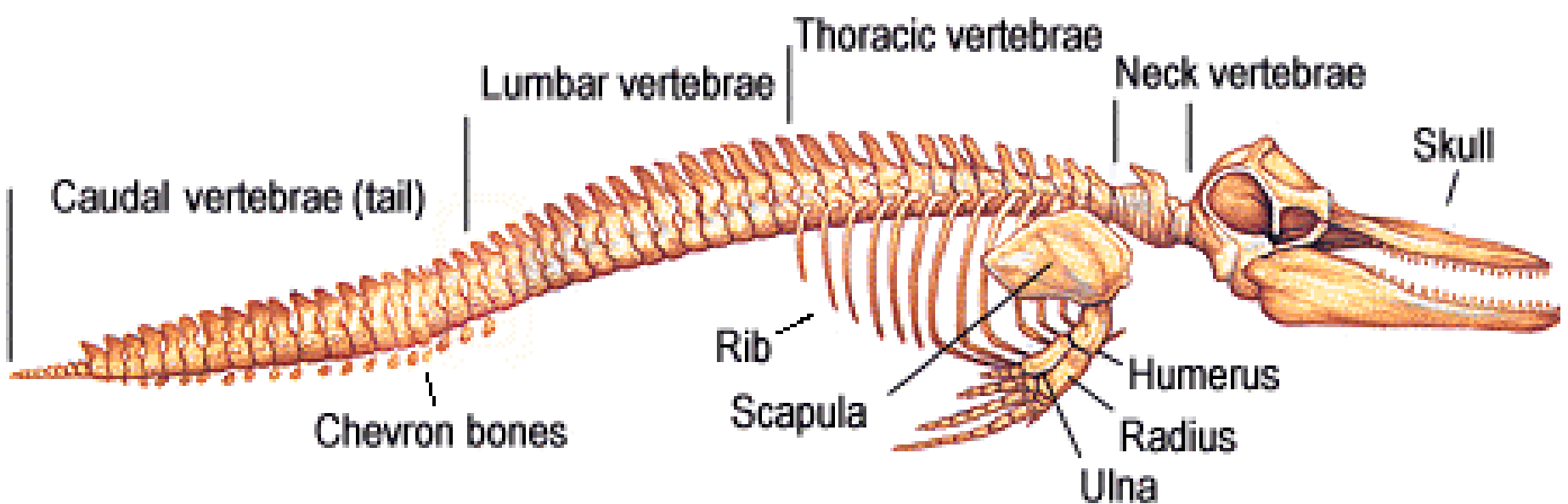
## **Vertebrae**

This is a piece of vertebrae from the dolphin's spine. Cetaceans have two kinds of vertebrae: cervical (neck) vertebrae which connects to the skull, and the trunk vertebrae. The trunk vertebrae is separated into two subcategories: thoracic (with ribs) and lumbar vertebrae (without ribs). The piece in this picture appears to be lumbar (trunk) vertebrae.



## Head

A number of skull features are thought to be useful for improving the Dolphin's echolocation abilities. These include reduced cheek-bones and expanded middle ear cavity. The head also contains all of the important equipment for echolocation, such as the melon and air sacs of the upper nasal passages.



Looking at the skull in this picture of a dolphin's skeletal anatomy, and referring back to the external and internal anatomical pictures from slide three will be helpful during our brief discussion of echolocation. Echolocation is a form of sonar for cetaceans. They produce sounds that are bounced off of objects in the ocean, then obtain a mental "picture" of their environment by determining how long it took the sound to return. The echolocation clicks are produced from air sacs located in the upper nasal passages, directly in front of the blowhole at the top of the skull.



## Melon

The student in this picture is holding the dolphin's melon. The melon sits right on the base of the skull where the jaws curve upward into the head. As you can see from the previous slide, this part of the skull is actually flat; the melon is what gives the dolphin's head its round appearance. The melon plays a large part in echolocation by focusing the sound beam in the right direction. When the sound returns, it is not received through the ear, but through fatty deposits in the dolphin's lower jaw.

The Ocean  
Conservancy



For more information on all marine  
animals and how to save our  
oceans, visit:  
<http://www.oceanconservancy.org>

# Resources

## Pictures:

- <http://www.geocities.com/RainForest/Vines/5983/anatomy.html>
- [http://www.sarkanniemi.fi/oppimateriaali/dolphin\\_anatomy.html](http://www.sarkanniemi.fi/oppimateriaali/dolphin_anatomy.html)
- <http://www.tmmsn.org/>
- <http://www.dolphindreams.org.uk/site/main.htm?biology.htm&content>
- <http://www.t-d-e.org/info/anatomy/head.php>
- <http://www.oceanconservancy.org>

## Information:

- [The Little Guides: Whales, Dolphins, & Porpoises](#) by: Peter Gill