

Oral and Dental Anatomy of Dogs, Cats, and Ferrets

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The mouths of animals have several functions; not only do they take in food and water, they also aid in grooming, cooling, and communication. Oral and dental care is very important to the health and well being of pets. To understand the complexities of the mouth and teeth, it is important to first understand their anatomy.

Tongue and gums

The tongue is a very complex organ. It is made up of a system of muscles enabling the intake of food into the mouth and manipulating it to allow the animal to chew and swallow. Even among carnivores, the tongue functions differently. For example, when dogs drink water, the water is transported from under the tongue into the mouth. When cats drink, the water is transported from the top of the tongue. This difference is especially noticeable in sound: a drinking cat is relatively silent while a dog has to gulp more as he manipulates his tongue in the water and in his mouth. Hiccups in dogs, especially puppies, are common as dogs tend to swallow more air when drinking.

The tongue is usually pink in color. Dogs may have an occasional dark blue-black marking, while certain breeds, such as the chow, have a totally blue-black tongue. The tongue is covered with taste buds that distinguish flavors.

The tongue is also used as a grooming tool. The feline tongue is covered in backwards-facing, barb-like structures called "papillae" that wash, smooth, and dry the coat; they also aid in the removal of meat from bones.

The gums are most often pink in color but can vary among species. In the dog, like the tongue, the gums, as well as the inner cheeks, can have patches (or solid pigmentation) of dark blue to black.

Salivary glands

Dogs and cats have four pairs of salivary glands: parotid, mandibular, sublingual, and zygomatic. Ferrets have an additional pair, the molar salivary glands. Each gland has its own duct that carries saliva from the gland to the mouth cavity. Saliva keeps the inside of the mouth lubricated, makes the swallowing of food easier, and contains enzymes that can help begin the digestion of food. In animals that pant, saliva also aids in cooling animals through evaporation off of the tongue.

Bones

The upper jaw is called the "maxilla" and the lower jaw is called the "mandible." The shape of an animal's skull affects the positioning of the teeth. In dogs and cats, there are three major types of head shapes:

- Brachycephalic: short, wide muzzle. For example, Pekingese, Pugs, and Persians.
- Mesaticephalic: medium length and width muzzle. For example, Golden Retrievers, terriers, most cats, and ferrets.
- Dolichocephalic: long, narrow muzzle. For example, the Doberman Pinschers, Greyhounds, or Oriental cats.



Teeth

Types of teeth

Mammalian carnivores have teeth that line the upper and lower jaws. There are four types of teeth with different functions:

- Incisors: cutting and nibbling food
- Canine teeth: holding and tearing food
- Premolars: cutting, holding, and shearing food
- Molars: grinding food



Numbers of teeth

Many mammals, including dogs, cats, and ferrets are "diphyodont" meaning they have two sets of teeth, one set (called "deciduous") being shed and replaced by a permanent set. Although the exact number can vary, puppies have 28 deciduous (temporary or "baby") teeth, and adult dogs have 42 permanent teeth. Feline kittens have 26 deciduous teeth, and adult cats have 30 permanent teeth. Ferret kits have 30 deciduous teeth, with adults having 34.

Tooth eruption

In kittens and puppies, the deciduous teeth begin to erupt at about 3-4 weeks of age and the permanent teeth begin to emerge at about 3-4 months of age. By 24 weeks of age, usually all of the permanent teeth have emerged.

In ferrets, the deciduous teeth also start to erupt at about 3 weeks, but the permanent teeth start to emerge between 7 and 8 weeks, and by 10 weeks, most of them are present.

Animal	Number of Deciduous Teeth	Number of Permanent Teeth	Age at Eruption of Deciduous Teeth	Age at Eruption of Permanent Teeth
Dog	28 •14 upper •14 lower	42 •20 upper •22 lower	3-8 weeks	12-26 weeks
Cat	26 •14 upper •12 lower	30 •16 upper •14 lower	3-8 weeks	11-24 weeks
Ferret	30 •16 upper •14 lower	34 •16 upper •18 lower	2-4 weeks	7-10 weeks

A deciduous tooth should be lost before its permanent replacement appears. When a carnivore has both a permanent and deciduous tooth at the same site, it is referred to as a "retained deciduous tooth." These need to be removed surgically to prevent abnormal alignment of the permanent tooth.

Tooth anatomy

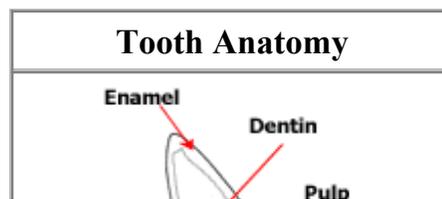
Each tooth has a crown (located above the gums) and a root (located below the gums). Some teeth, such as incisors, have one root, while others, such as the largest cutting premolar, called the "carnassial tooth," has as many as three roots. A tooth is composed of the following structures:

Pulp: The pulp is at the center, or core of the tooth, and consists of connective tissue, nerves, and blood vessels that nourish the tooth. Most of the nerves and blood vessels to the tooth enter through the apex (bottom) of the root. Special cells in the pulp, called "odontoblasts" form dentin.

Dentin: The majority of the tooth is made up of dentin, which surrounds the pulp. Dentin is as hard as bone but softer than enamel. Dentin is a tissue that can detect touch, heat, and cold. Primary dentin is dentin that is formed before tooth eruption; secondary dentin is dentin that is continually formed throughout the life of the tooth. As the secondary dentin forms, the pulp chamber reduces in size. The dentin of the crown is encased in enamel and the dentin of the root is covered by cementum (see explanation below).

Enamel: Enamel is the hardest tissue in the mammalian body and is formed before tooth eruption. Just before the tooth erupts through the gums, the formation of enamel stops and is lost gradually over the life of the tooth. Although enamel is very hard, it is brittle, too, often subject to chipping.

The tissues that surround the teeth are called the "peridontium" and consist of the alveolar bone, periodontal ligaments, cementum, and gingiva.



Alveolar bone: The alveolar bone forms the jaw and the sockets into which the roots of the teeth extend.

Periodontal ligaments: This tough tissue helps to hold the tooth in the socket. It attaches to the cementum of the tooth and the alveolar bone.

Cementum: Cementum is hard, calcified tissue that covers the dentin of the root and is slowly formed throughout the life of the tooth. It assists in supporting the tooth in the jaw and in root repair.

Gingiva: The gingiva, also called the "gums," is the soft tissue that covers the rest of the periodontium.

Lateral canal: The lateral canal is a very small channel that connects the root pulp to the periodontal tissue through which small blood vessels run.

Summary

Understanding oral and dental anatomy is the first step in providing proper dental care. Become familiar with the anatomy of your pet's mouth so you will be better able to detect problems early.

