**Source:** [**http://www.k9-massageguild.co.uk/canine-versus-human/**](http://www.k9-massageguild.co.uk/canine-versus-human/)

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**CANINE versus HUMAN**

By [Natalie Lenton](http://www.k9-massageguild.co.uk/author/natalie-lenton/) on 9th December 2017 in [Canine Massage Therapy](http://www.k9-massageguild.co.uk/category/canine-massage-therapy/)

Natalie Lenton from the Canine Massage Therapy Centre shares some fascinating facts on the dogs who share our lives and our hearts…

The fascination between us and our dogs can partly be attributed not just to our differences but also to our similarities. We share the same 11 physiological systems but the potential and ability of these systems differs between our species. Some you may already know and others will astound you….

**The Skeletal System**

**Skeletal Assembly**

Dogs and humans have all the same bones in the same locations. The elbow of the human is composed of the humerus, radius and ulna; just like the dog.

**Major Differences**

Some bones are different shapes, such as the femur or thigh bones, which are more bowed on the dog.

The scapula or shoulder blade, which on the human is located on the back (anterior), while on the dog it is attached more onto the side (lateral aspect).

The dog does not have a clavicle. Some have a useless ossified structure but it provides no support or scaffolding for other bones unlike the human. The human has a clavicle, or collarbone which is the reason why we have more stability and are less likely to injure ourselves when doing pull ups. Due to this axis we are also able to put a flexed arm behind our back and on the front of our body as well as into a sling. The dog’s foreleg cannot be slung as there is no 3-way rotational axis between the scapula, humerus and clavicle. Instead, the dog’s shoulder stability and movement relies purely on a group of shoulder girdle muscles, which sling in and stabilise the foreleg. This is why these shoulder girdle muscles of the dog commonly become strained or ripped, which shows as intermittent lameness in the dog.

The patella or kneecap of the human sits directly over the tibia and femur to form the knee joint. The dog’s patella however sits above the joint at the bottom of the femur. The knee joint of the dog is called the stifle or true knee and is held together by cruciate ligaments and a patella ligament as well as extracapsular ligaments. The excessive motion and torque on the joint makes the cruciate ligaments degrade over time; so, repetitive activities, such as ball chasing, only serve to weaken them over time, much like a rope that frays.

**Spinal column comparison**

As you can see from the table below, we have the same spinal column composed of the irregular shaped vertebrae, but dogs and humans each have a slightly different composition:

| **AREA** | **HUMAN** | **DOG** |
| --- | --- | --- |
| Cervical (neck) | 7 | 7 |
| Thoracic (middle back) | 12 | 13 |
| Lumbar (lower back) | 5 | 7 |
| Sacrum (top of pelvis) | 5 | 3 |
| Coccyx (tail bone) | 3 - 5 | Up to 23 |

**Showing 1 to 5 of 5 entries**

The dip often seen in the middle of the dog’s spine is where the orientation of the spinous processes change. In dogs, this occurs between T7-T10 and it is completely normal. A spinal abnormality would be classed as roaching (kyphosis) or swayback (lordosis).

The coccyx or tailbones of the dog are not only used for communication and scent wafting but importantly balance and steering. In the human, the coccyx is also a fully functional part of the vertebral column and is not, as was once assumed, a vestigial or useless part of the system. In the human, the tailbone is used for the attachment of the Gluteus Maximus, the coccygeal muscle and the tail muscle, exactly as they are in the dog.

Damage to the coccyx in both the human and the dog will not only cause immense pain but in both species will affect walking and defecation. Typically, rather than producing one large stool the subject with torn or strained coccygeal muscles and a bruised coccyx will have difficulty in defecating. In dogs, this will exhibit as a dog who has to do lots of little poos or one who struggles or finds it painful to go to the toilet.



Humans have 206 bones while dogs have approximately 320 depending on the length of the tail. Of the human’s 206 bones, 106 bones are in the hands and feet; 27 in each hand and 26 in each foot). The extra bones of the dog are attributed to the extra teeth and vertebrae.

**Skull Types and Meaning**

The Cephalic Index or Cranial Index is the ratio of the width of the head multiplied by its maximum length; e.g., Horizontal to Vertical plane. The index is used to classify both, human and dog skulls.

**Dogs’ skulls can be classified into 3 types**

* **Brachycephalic** – flat nosed, which affects the function of the respiratory system due to compression of the skull - e.g.: Pug, French Bulldog, Cavalier King Charles and Shih Tzu
* **Dolichocephalic** – long nosed with elongated skulls - e.g.: Greyhound, Saluki, and Borzoi
* **Mesaticephalic** – medium nosed - e.g.: Labrador, Beagle and Border Collie

Interestingly in **Human Anthropology,** there are 3 classifications of skull:

* **Caucasian**
* **Asian**
* **African**

The human anthropological index has also employed the same 3 terms of the dog and is still commonly used, to classify the origin of skeletal remains.

**Mouth & Digestive System**

**Teeth**

The dog has 42 teeth. Classed as a carnivore the teeth are sharp and pointed for ripping flesh. However, it is evident that the dog is also an omnivore as they, too, will eat plant material, which they use their molars for.
The human has 32 teeth, and is classed as an omnivore with incisors for cutting and molars for grinding & crunching plant based matter.

Amylase is the enzyme responsible for breaking down starchy carbohydrates and in humans is made in the pancreas and in the glands, which secrete saliva. This is why humans need to chew their food in order to stimulate the production and release of saliva. The dog however produces amylase in the pancreas and small amounts are produced in the small intestine and liver.

**Taste Buds**

Has anyone ever told you that dogs do not have a sense of taste? It may not be as developed as ours, but their sense of taste is enough for them to distinguish a variety of different sensations.
Dogs have around 1,706 taste buds, which are concentrated around the tip of the tongue. They can taste sweet, sour, bitter and salt.
Humans have around 10,000 taste buds, which are situated inside the cheeks, the roof of mouth, lips and tongue.

Dogs will receive far more information about their food via their sense of smell, which leads to an interesting difference in the dog’s senses called the vomeronasal organ ….

**Nose**

The *vomeronasal organ* is also known as *Jacobson’s organ* and is located above the front teeth at the base of the nasal cavity. It is an extra olfactory sense organ, which is an organ of chemoreception.
This is a process where the dog can respond to chemical stimulation in their environment and is a prime factor in the reason why dogs are still able to self-medicate whereas this has been lost in most humans. This can be seen in the beautiful art of zoopharmacognosy, where the dog is able to self-medicate with oils, clays, grasses and other natural plant materials. It is also the reason why we have cancer detection dogs, as they are able to process the hormones and neurotransmitters that are different in those patients. The flehmen response is a sure sign that the vomeronasal organ is being used and can be seen in mammals including dogs and commonly horses. This is where the animal curls back the upper lip exposing their front teeth and inhaling with the nostrils closed. This enables chemicals to be transferred to the vomeronasal organ, which is then processed via the mucous membranes, to the brain and specifically to the amygdala; a part of the reptilian or oldest part of the brain.

The vomeronasal organ in the human has been subject to much debate and often dismissed with ridicule, although it may be argued that this is how we process pheromones and other chemicals.

With a mere 5 million scent cells, it is a wonder we humans can process anything at all. The dog on the other hand has up to 220-300 million. That is roughly 40 times stronger than ours. Although both species do have turbinate bones in their nasal passages, which essentially whisk up the molecules to improve distribution for processing, the dog’s **is** far more efficient. According to Dogtime website, the number-1 dog for scenting is the Bloodhound with a massive 300 million scent receptors, closely followed by the Basset Hound, Beagle, German Shepherd, Labrador Retriever, Belgian Malinois, English Springer Spaniel, Coonhound, German Shorthaired Pointer and English Pointer coming in at Number 10.

Some dogs are able to trace scents from more than 1 mile away and are able to process chemicals, such as adrenaline and pheromones of the human. Cancer and bio-detection dogs are trained to identify specific odours and indicate other issues such as diabetes, Addison’s disease, cardiac conditions and life-threatening allergies, such as nuts.

The nose print of a dog is as unique as the fingerprint of the human!

**Muscles**

Without muscle the body cannot move. We talk about the body in terms of joints; the shoulder, the elbow, the hip; but what is often neglected is the consideration of the muscles, which are responsible for moving that joint.

**Muscular Issues**

Dogs are prone to exactly the same muscular and myofascial issues as humans:

[The strain](http://www.k9-massageguild.co.uk/strain/) – The tear to the muscle caused by overstretching. There are 3 grades of strain and they are very debilitating and often not assessed using traditional allopathic medicine.

**Symptoms of the strain**

• Lameness – Acute/Chronic/Intermittent
• Bruising and haematomas, ‘Hot Spots’
• Reluctant to be touched
• Vocalising in pain/whimpering/crying
• Lack of weight bearing
• Ageing or slowing down seemingly overnight
• Coat changes e.g.: Fur flicks
• Grumpy/antisocial/may become seemingly aggressive
• Stiffness
• Unable to jump/go up or down stairs
• Difficulty in jumping on the sofa
• Guarding an area

Many dogs are diagnosed with arthritis at an early age because they have gone lame. Arthritis, however, does not come on overnight. A Strain can happen in the blink of an eye and common causes of a strain in dogs are:

Slipping on laminated/tiled floor
Twisting
Any activity that is repetitive e.g.: Tuggy
Jumping in/out of the car
Ball chasing/ball launching
Canine sports e.g.: agility
Rough handling by the owner –pulling the dog about
Owner pulling the dog about on a lead
Body slamming with other dogs/rough play

Clinical massage therapy for dogs is undoubtedly the most effective therapy that helps to rehabilitate the strain. It relies on scar tissue being remodeled with direct application of techniques, and is preferable to laser. Chiropractic or Mctimoney animal manipulation will not directly address the tissue; this therapy is used only on the skeleton to correct subluxations in the vertebrae, which allows nerve pathways to run more freely.

It is muscle, which endows the animal kingdom with the power of movement. Muscle accounts for around 45% of the dog’s entire bodyweight and the dog has around 350 pairs of muscles.

The majority of the dog’s muscles are the same as humans, however many of the origins (where a muscle starts) and insertions (where a muscle ends) are different.

The human does not have a sternocephalicus, cleidocervicalis or omotransversarius, although the omotransversarius of the dog may be likened to the levator scapula of the human and the cleidocervicalis may be likened to the sternocleidomastoid. On the dog these are all muscles, which provide extra stability for the skull and neck. Massage therapy with a member of the Canine Massage Guild will usually produce visible improvements in 1-3 sessions.

**EYES**

The human has evolved to be diurnal meaning they are active in the daytime, whereas dogs have evolved to be more active at dawn and dusk. The ability of the dog’s eyes reflect their preferred time of activities with some of the differences below.

Colour – It is a fallacy that dogs do not see in colour. They do, but for them it is like seeing colours at twilight; they do not see in black and white but see more like a person who has red/green colour blindness. Humans have 3 different colour sensitive cones located in the retina which sense red, green and blue while dogs have only 2 cone cells which sense yellow and blue. This does not mean that dogs cannot see green or red it just means that they find it harder to distinguish between green, red and yellow objects. A high contrast of colour such as blue and yellow will be most easily visible for the dog.

The reflective glint in your dog’s eye as they walk towards you at night is due to a layer called the Tapetum Lucidum: a reflective membrane behind the retina that increases light available to the photoreceptors. This in turn enhances the dog’s visual sensitivity making their vision superior of a night-time.

With less sensitivity to brightness than the human eye, the dog will also have less acute vision. So, a human with 20/20 vision may see an object at 75 feet away, whilst a dog’s best vision is 20/75 meaning they will need to get closer to an object. The fovea of the human is a part of the eye that we use to look at fine detail and text. As the dog does not have a fovea, it is harder for them to discern fine detail, hence relying more on their nose to give them information. Instead of a fovea, the dog has something called a ‘visual streak’, which is a line across the back of the retina. This is most obviously seen, when watching a herding dog like a collie; the dog will lower its head and neck and stare. This is an indicator that they are essentially lining up their visual streak, which is full of dense light (photo) receptors and gives them finer vision. The breed with the most acute visual streak is the Greyhound.

Extra eyelid – the nictitating membrane, which slides across the eye to prevent damage from dust and undergrowth, is commonly called the 3rd eyelid. This is absent in the human.

Looking at the eye set of the dog will give you some indication of their field of vision. With eyes on the side of their head, the dog has 240 degrees of visual field whereas the human has only 200 degrees. This is a common feature in many mammals and is also used as a part of their safety so they are able to see threats sooner.

**EARS**

Humans can hear frequencies ranging from 12 to 20 kHz and females tend to have higher sensitivity to higher frequencies. Dogs on the other hand have a much wider range and can hear up to 60 kHz.

Eighteen (18) muscles are used, to move the ears of dogs with prick ears e.g.: German Shepherds, who will have better hearing than a dog with floppy ears such as a Cocker Spaniel. The ear set of the human means ours are flat on the side of our head whilst the dog’s ear set will depend on the breed. The 18 muscles responsible for moving the dog’s ears enable them to angle their ears to hone the sound. The human has a pathetic 3 muscles, helping us to truly appreciate how dogs are able to adapt their ear set to better improve the reception of sound. (Interestingly cats have 32 muscles, which move their ears!)

**SEX ORGANS**

Male Dog: After ejaculation, the penis of the male dog will swell and turn down allowing the dog to ‘tie’ with the female. This prevents the female from copulating with other males and helps the sperm to stay in the vagina for longer. Human sperm only live for a few days within the female. The dog’s sperm however can live in the female’s reproductive system for 11 days. A female dog who has mated with several males and has several batches of sperm means that it is possible for puppies to come from several fathers. Hence, why some litters of puppies are so diverse in appearance.

The Chromosomes are structures of nucleic acids and proteins found in the nucleus of living cells and they carry genetic information, which form the genes.
Dogs have 39 pairs and Humans have 23 pairs.

**SWEAT**

With all those extra scent cells, can you imagine how much we humans smell to our dogs? Not only that but humans of course are able to sweat using glands located all over their body; such as under the armpits, the groin and the eccrine glands. The dog however is only able to sweat from their paws and their nose and rely on cooling themselves down through panting and via the cooling of their ears.

Natalie Lenton is Director of the Canine Massage Therapy Centre, Chairperson of the international association the Canine Massage Guild, author of the best-selling DVD ‘Canine Massage in 3 Easy Steps’ and is a feature writer on canine natural healthcare for press and media. She lectures on the 2 year Clinical Canine Massage Programme, runs one-day workshops for owners and delivers advanced massage at CPD level. She lives in Worcestershire with Pip her Jack Russell and her accident prone Greyhound Nell.
[www.k9-massage.co.uk](https://www.k9-massage.co.uk)