Nordic Dog Symposium 2019

Moving forward again!

As ever, the weekend didn't disappoint. Martin Fischer's recap and update on his team's research were well worth returning for, and then some. Kirsti Grant spoke about taking our dogs to the groomer's and the problems she often encounters. She showed us pictures of her fantastic indoor enrichment area, which she has set up specially in a rented space, and videos of dogs exploring it with all the fun that brings. There were some cautionary tips as well. Chiara Mariti presented her research on calming signals and elicited a vibrant discussion on observation/anecdotal findings vs peer-reviewed research. For those of you who weren't present, you'll not be surprised to learn that the findings so far confirm what Turid has taught for decades! On Sunday, Stephanie Rousseau gave an inspiring presentation about bringing dogs to work, how to cooperate with colleagues, employers and other dogs and manage the space they work in, and how to keep our dogs happy when they join us at the office. And last but not least, Els gave an eye-opening talk about body and behaviour. It was amazing watching dogs with problems do simple tasks, for example walking or standing on a low wooden plank or beam or navigating the rungs of a ladder on the ground, and to learn how it had helped with some of their behavioural issues because it had brought better proprioception and stability to the body. And again, the fun, the laughs and the great fellowship made it another weekend to remember.

PART 1

This year's report is in two parts. Part 2 (Els Vits, Chiara Mariti) should be ready in early May.

We look forward to seeing you again next year!

Dog Symposium 2020

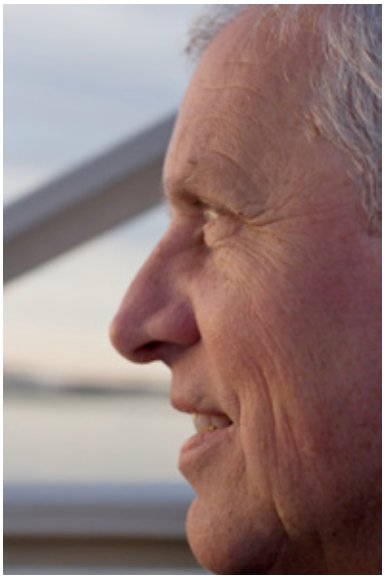
7–8 March

www.dogsymposium.no

Note to the reader: Due to issues with the layout software, pictures, text and columns may appear misaligned, for which we apologise.

Dogs in motion: An update

Martin Fischer
Germany



Martin S. Fischer is a full professor and director of the Institute of Zoology and Evolutionary Research at the university of Jena, Germany. He has a deep interest in functional morphology and integrates experimental approaches using a broad array of setups with classics such as comparative anatomy. One of his key concerns is to understand the evolution of motion systems. He has developed high-speed fluoroscopy to a new level and has applied it together with many co-workers to a large variety of tetrapods. He is also a museum director and initiates and participates at national level on projects for the future of scientific collections. He is a member of the Scientific Advisory Board of the German Kennel Club (VDH) and collaborates with different partners in veterinary sciences.

This was the second talk by Martin Fischer on this topic. Please refer to Part 2 of the 2017 summary, downloadable from *dogsymposium.no*, for information on the first talk.

Martin began by explaining that his team in Jena, Germany, are working hard to bring new data on a regular basis. There are four people on the Jena team who are working exclusively with this topic. He said that they are so many opinions around the world that the role of scientists is, more than ever, to try to improve the basis of knowledge.

We should never forget that our dogs are descended from wolves. The domestication period, whether tens or hundreds of thousands of years, is extremely short in terms of evolution. The reason dogs are so interesting to evolutionary biologists is the tremendous change that has occurred, with many hundreds of breeds having developed in such a short time. One of the topics at the German Zoological Society meeting this year is domestication.

Two years ago, Martin showed us a beautiful slide from an article entitled "Dogs hijack the human bonding pathway." Another nice work has since been published, by Juliane Kaminski et al., showing that human attention affects facial expressions in domestic dogs.

Interestingly, we cannot improve this by giving food. That is important, because it strongly underlines Turid Rugaas' approach. This is the core of domestication. We have always heard that domestication happened merely for practical reasons, in order to have a companion for hunting or taking care of our garbage. However, this bonding is probably one of the starters of domestication. It is also quite recent, going back about 12,000 years. In the Jerusalem national museum is the complete skeleton of a 26-year-old woman with her hand on a puppy. It is clear that the puppy is not food for the next world but an object of affection.

Dr J Matthias Starck has done a study of sled dogs in Greenland. In winter, sled dogs carry heavy loads over great distances and are very well fed. In summer, however, traditionally they are barely fed and some even die of hunger. The study by Dr Starck measured the resting metabolic rate of these dogs and showed that in summer there was basically no activity. In winter, the calorie output was huge: The mass specific oxygen consumption was 12 times more than the resting energy.

A study by Loftus et al. from 2014 showed that the daily calorie intake of a dog participating in the Yukon Quest sled race is around 14,000 Kcal per day. For context, Icelandic professional strongman and actor Júlíus Björnsson, who plays the Mountain in Game of Thrones and at 180 kg is the world's strongest man, has a daily calorie consumption at the height of training of 12,000 Kcal. The sled dog energy consumption is the highest ever measured in mammals. It is 8–9 times the daily consumption of a Siberian husky living at home. A husky should never be confined at home, especially alone.

According to Bryce et al. (2017), huskies are the "most elite endurance athletes in the natural world." They use approximately 4400 J/kg/day while racing 490 km over 3 days at approximately -20°C. Compare this to 2000 J/kg/day for thoroughbred horses during heavy training, and 1400 J/kg/day for Tour de France cyclists.

Working sled dogs are fed mostly fat. The amount of meat they would need would approach 8 kg per day, which is impossible to eat. Dogs have a particular fat metabolism which is still not fully understood. They can activate ketones and digest fat in a way other animals can't. In fact, these dogs can outperform wolves. Many people have the idea that domestication equals degeneration, and in most cases this is true, but it can go in the opposite direction as well.

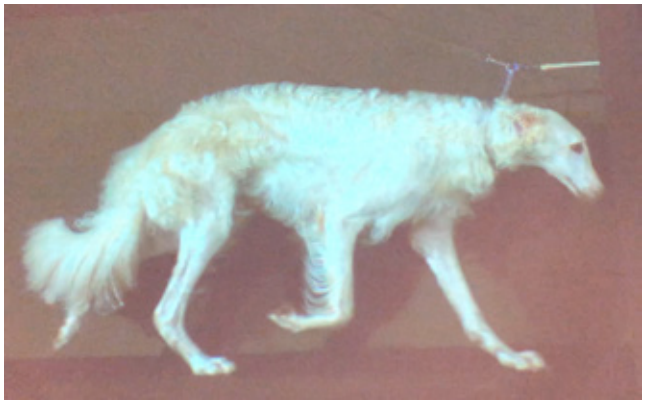
The Jena study of dogs in motion — a recap

Further details on the study can be found in the Dog Symposium report from 2017, downloadable from the website.

Sagittal plane motion

Thirty-two dog breeds, ten dogs per breed, were studied in the sagittal plane (from the side). All the data from the first big round was in this plane, because the main topic of observation was how dogs move *forwards*. The study found that there is hardly any difference between breeds regardless of whether they are walking, trotting, pacing or galloping. Not all dogs show all different modes, but most dogs love to trot; for them, it is their everyday gait. It is almost the same for wolves; when they are covering their daily distances of 30–40 km, they do so mainly by trotting. Trotting at a certain speed (e.g. 12–18 km/h) is the most energy-efficient type of locomotion. During walking, mammals mostly have three legs on the ground, a bit like a tripod. But during the trot, in most dogs there are two legs on the ground and very little shift of the centre of gravity. If the legs go further under the body or if there is a wider stance, the effect is not as good. Wolves are constructed in such a way that when they trot, the centre of gravity does not move either sideways or vertically; it is pretty much a straight line.

The last six years have brought a change in paradigm when it comes to pacing (see summary from 2017). A specific gene plays a key role in configuring the spinal circuits that control stride in vertebrates. A rare mutation causes animals to pace (forelimb and hindlimb on the same side moving in parallel, rather than alternating). This mutation (in the DMRT3 gene) has been shown to cause pacing in mice and horses. Although the effect has not yet been demonstrated in dogs, very likely it applies to them also. A study in Germany from 2016 genotyped more than 4000 horses from 141 breeds and found that this mutation can be traced back to 9th-century Medieval England. Today's Icelandic horses are descended from horses brought from the British Isles by the Vikings, and the mutation is a stable feature in this equine population. Scientists are now convinced (a word not used lightly in the scientific community) that pacing is a characteristic of wolves and dogs. Pacing is not an aberration that should be penalised by show judges or otherwise. *However*, if the dog started pacing later than in puppyhood, the feature is not inherited and could be indicative of something else, like problems in the lower spine. Dog behaviourists and vets should be careful to observe pacing in dogs and question the owners about when it started.



Martin showed a video of a Borzoi trotting in the most optimal way (notice only two feet on the ground). The head barely moves. There is slight rolling of the skin on the top of the back, indicating a minor sideways movement with the rotation and translation of the centre of gravity.

On a much larger and heavier dog like a mastiff, the rolling is much more evident because there is a greater displacement of the centre of gravity. For that breed it is normal, but for a Borzoi it would be horrible. The track *width* is of crucial importance for energy consumption. It is much wider in a mastiff than in a sight hound like the Borzoi.

In the early experiments in Jena and elsewhere during the 1990s and 2000s, marker tapes were attached to the skin of the dog, but this created problems of skin motion. The breakthrough came in 2006 with high frequency X-ray videography, which produces up to 2000 X-ray frames per second. (See 2017 summary for a description of the red laser dot, which moves horizontally from the shoulder blades to the pelvis while the dog is in motion.)

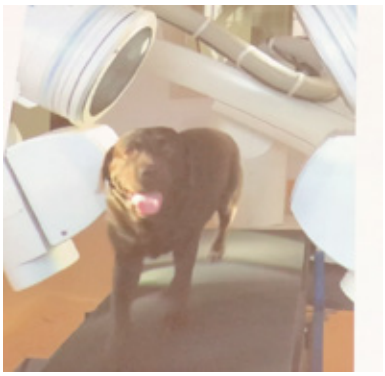


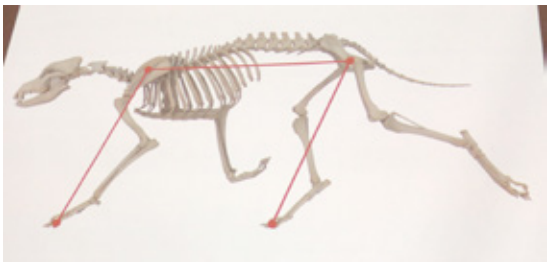
Figure: High-frequency X-ray videography setup with a dog moving freely on the treadmill. (The Jena collection has 52,000 X-ray movies that are digitally accessible, even of birds. Please contact Martin Fischer if you would like to access them for teaching or research.)

The X-ray movies show that when a dog is moving forwards, the moment the forelimb touches down, the elbow keeps its shape. The same is true of the shoulder blade; there is very little rotation. The X-rays are also taken from above the dog (see figure above). This biplanar recording is crucial for studying 3D motion.

The stability of the joint on touchdown has been described by an American researcher as “strut-like” behaviour.

Position of pivots

To understand the low energy consumption of wolves and dogs, it is important to drop the old-fashioned view that all motion comes from the arms and legs (folding and extending the elbow or knee, etc), which is still prevalent in some textbooks. In fact, the motion is in the *shoulder*, like a pivot (see summary 2017). The shoulder blade was thought to be more or less fixed to the chest, but it is not; it works like a pivot. In many museums, skeletons of dogs are mounted incorrectly, with the hip joint much too low. To make things worse, even the Fédération Cynologique Internationale (the World Canine Organisation) still has the wrong posture on their website, with the hip joint below the shoulder:



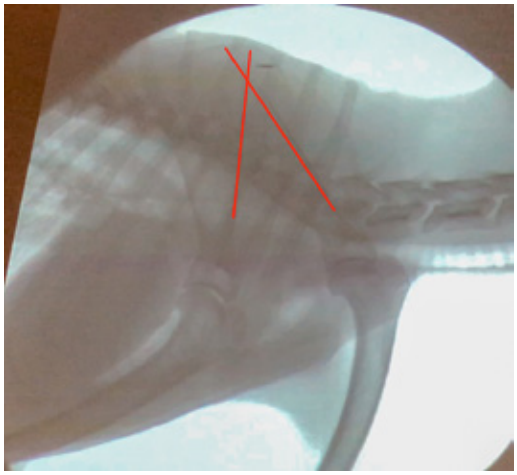
The correct posture, as in this skeleton of a trotting wolf, shows a beautiful symmetry. The hip joint is aligned with the upper third of the scapula.

Simulating a dog’s forelimb on the treadmill, Martin loosely held the top pivot (shoulder blade) and let it swing like a pendulum, showing how easy the movement is. The leg does not change shape. With this in mind, imagine how boring it is for a dog to trot alongside its owner’s bicycle. Because a pendulum is the best way to save energy, not only is the dog bored, it is not consuming energy. An active dog needs only about 5–8% of its daily energy consumption for locomotion.

It was long suspected that dogs of different breeds were similar in their locomotion, but now there is evidence. The mean value of the Dachshund and the Great Dane is very similar, but ten Great Danes and ten Dachshunds will move differently. The individual variation within a breed is higher than the difference between breeds.

THE OVERLOOKED MAJOR PLAYER: THE SHOULDER BLADE

Martin went into this in some detail last time (see summary part 2, 2017). The crossing point of the shoulder blades during trotting is near the top, which gives a longer stride.



Screenshot of an X-ray sequence showing the crossing point of the shoulder blades in a trotting whippet).

The figure also shows how close the leg comes to the 5th and 6th cervical vertebrae. Therefore, the motion of the scapula is not in the thorax, it is towards the neck. And step length is ruled by the shoulder blade rotation. Dogs that take small steps have a smaller angle between the shoulder blades (the two red lines), and dogs that take large steps have a bigger one.

However, regardless of the size of step, there is one consistency: at lift-off, the position of the shoulder blade (top red line above) is almost always vertical or slightly beyond, at 90–100°. It moves forwards to about 70° in a short step and to 55-60° in a long step. This is possible because there is no joint at the shoulder blade. The locomotion of the forelimb does not take place at the shoulder joint; it is controlled entirely by muscles. The shoulder blade movement is very similar whether in a bulldog, beagle, Malinois or whippet.

Why is the forelimb constructed the way it is? A PhD study in Jena, Germany, of dogs performing agility has measured the forces involved, including the load in each joint. The absolute limit at which a dog should do agility is 20 kg. This is because muscular force is directly related to the "physiological cross-section" of the muscle. A small increase in the cross-section of the muscle will produce a much larger increase in muscle volume. Thus, a small dog like a Chihuahua has an enormous force for its size compared to a larger dog. The bigger the dog, the relatively weaker it is. A 20 kg dog landing after a jump needs to compensate for all of these 20 kg on two paws. This is why heavy dogs avoid jumping, and why elephants can be kept in an area surrounded by a small deep ditch, because they cannot jump over it. In all the dogs the Jena team studied that were below 20 kg (over 25 dogs weighing around 17 kg in different situations), the force on landing was never more than twice the body weight. This is not a problem for the joint. All of this is because the shoulder blade is not fixed but held by muscular slings.

One of the worst things we can do with a dog is throw a frisbee. When he jumps, he lands on his *hind* legs, which are fixed in the hip joint. Imagine jumping up 10–15 cm and landing on your heels and straight legs. This is why when we land after even a small jump, we bend our knees to compensate.

Several years ago, Martin participated in a BBC documentary looking at the way cats move. The leverage in their limbs, and the force behind them, is incredible. On X-rays, the bones almost look like a Swiss knife opening and closing.

HARNESSES

Martin shared that he is often in contact with Italian harness producers Haqihana, who also work with Turid. Recently they asked him to comment on a harness from a biomechanical perspective, but he refused, because there is not a single study on the dynamics of a harness. If a 20 kg dog pulls with a force of 5 kg, nobody knows what is happening; it is all a matter of opinion. Martin forwarded the question to the chief biomechanics expert at the institute, but he wouldn't comment either.

Should a harness be broad or narrow? The only thing that can be said is that it should be broad where there is a lot of force, and it can be narrow where there isn't. But where exactly the forces are and where the pulling points should be is still unknown from a biomechanics and physics point of view.

What determines the length of the back part of a harness? There should be a valid argument for the chosen length. Remember that the forelimb moves forwards to the 5th cervical vertebra, and unfortunately that is where most of the harnesses are. Harnesses that sit horizontally across the front of the chest restrict this movement and the rotation of the scapula. The forelimb also moves back to around the 5th rib. So, the back of the harness should reach at least the 5th or 6th rib but not the 8th or 9th, because then it interferes with the diaphragm.

Conversely, the argument against collars is that collars constrict the throat. We think of our own anatomy, and how it would feel to have a dog collar around it. But there is a difference. Only humans have the bony cartilage that low in the neck. In fact, it drops down in babies at around 12 months of age, enabling speech. But in dogs, the cartilage remains high up in the neck, near the atlas. The only way to really hurt the larynx is with a taught and skinny show lead, where the dog's head is being forced up. A normal collar in the usual position does not generally hurt anything (providing it is not jerked).

For a three-ring anti-escape harness there has to be a proper indication. Control freaks love to have as many rings as possible. Martin said that any client using that kind of harness without a valid reason should be told to remove it. The third ring is very close to the diaphragm. The three-ring harness is for sight-hounds that have a large barrel chest and small head and easily come out of standard harnesses. The third ring *should be loose* and not constrict the diaphragm; it should *only* be there to prevent the harness from sliding off the dog. It also provides a larger area for distributing load. In sight hounds, the chest is said by some to be more fragile. Because it is so narrow it is claimed that any further restriction would interfere with breathing. Martin does not believe that himself.

During a short Q&A, Martin explained that he only uses a harness on his dog in town. Otherwise, it is off-leash. He would not use a harness in the open field. He stressed that no proper biomechanics studies have been done of the effects of either the harness or the collar. The point is not to prove whether the harness is better, but what it is *for*. The ice is very thin whichever side of the argument we are on. Where Martin is concerned, when his dog is on lead, he "feels better" having it in a harness.

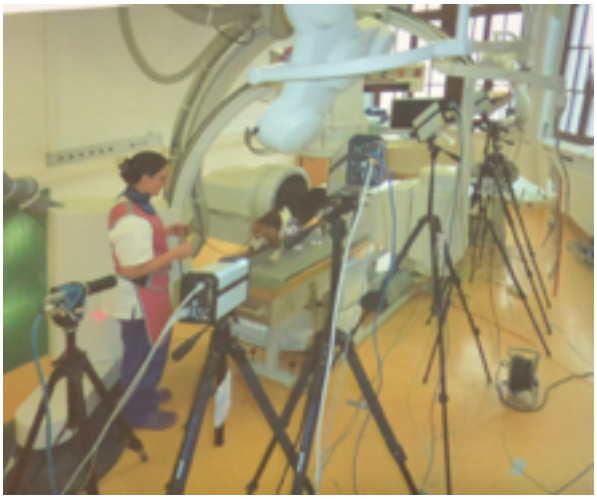
Martin closed the session with a recap (see summary from 2017) on the parallel motion of the limbs. When we see a dog in motion, we always get a sense of harmony. The femur and the shoulder blade move in total synchrony. Martin reminded us that the actual upper part of the forelimb is the shoulder blade, not the arm. In fact, the upper arm has the same direction as the *lower* hind limb.

ROTATION

After the break, Martin shifted from looking at dogs from the side to observing them frontally, restricted to four breeds: the beagle, the whippet, the Malinois and the French bulldog.

A group of 8–12 people in Jena studied these four breeds for 5 years. The beagle is the normal "object" when vets study dogs; along with the foxhound it is the most studied dog in locomotion. The whippet produces plenty of space for markers (40 markers per dog). Five Malinois police dogs also joined the study, and finally French bulldogs.

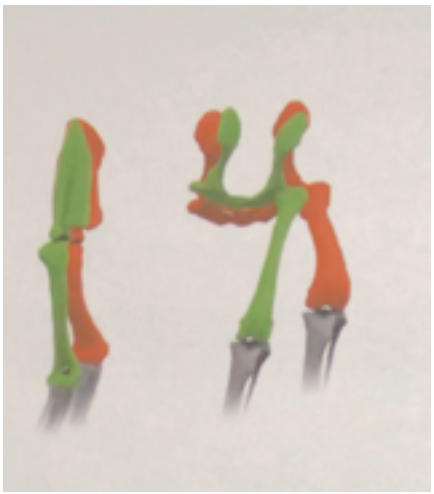
It is very important for the dogs to feel comfortable and unafraid while on the treadmill.



Treadmill setup using real-time and marker cameras.

Markers on the skin had already proved problematic in lateral photography, but it was important to show their limitations also frontally due to the sideways motion of the dog. In research it is important to be able to show that what one is doing wrong.

Seen from the front, there was not much difference between a walking and a trotting Malinois. During trotting there was a very slight shift of the back leg towards the centre (right, green). In the whippet this was slightly more pronounced, because the narrower the dog, the greater the movement of the limbs towards the centre of the body when trotting. However, the French bulldog (red) was the opposite: the shift was *outwards*. Although expected, the degree of the outward shift was surprising, even though the dog was considered to be perfectly healthy by the owners and orthopaedist. Later, it turned out that three of the five bulldogs had patellar luxation.



Frontal views of a trotting whippet (green) and French bulldog (red)

In the original movies that superimposed a 3-dimensional skeleton on top of X-rays (using Maya, the same software as Jurassic Park), the team had used a fixed patella because they never expected it to be that important. This meant that on touchdown of the limb, it was in the same position in the whippet and the bulldog, but this is not the case in real life. In fact, during walking, the femur of the French bulldog rotates outwards and the tibia does not. This causes sliding on the tibial plateau.

It took three months of work to complete the simulation, a screenshot of which is included here. Unlike in fictional films like Jurassic Park, the figures for this simulation are taken from real CT scans of each breed. The bones are then isolated to create a marionette-type structure. This is combined with the X-ray movies from the side and top of the dog. The result is a frame-by-frame match. Given that there are 500 frames per second, this comes to thousands of frames matched laterally and frontally for each step by hand!

Above is a screenshot from a video showing the rear limb of a French bulldog walking.

When a French bulldog is walking, the femur rotates outwards, sliding on the tibial plateau. During trotting it gets worse: the patella ends up facing sideways altogether. In forward movement, the axis of the limb rotates (put your arm out in front of you and rotate your hand as far as possible; the whole arm rotates). This is called long-axis rotation. As we saw in a set of draw-dropping slides, in the trotting whippet these movements are minimal, but in the bulldog they are extreme. Not only is the pelvis also moving from side to side, it causes the dog to lose distance because the forward movement is far less efficient. Currently, the French bulldog is the least efficient walker the Jena team has ever studied. Put simply, it cannot breathe properly or walk effectively. To cover 1 km, a French Bulldog needs more calories than any other breed of the same size.

In 2017, leading authorities in dog genetics Heidi Parker and Elaine Ostrander studied 161 breeds and produced a crucial paper that Martin said everyone should read (you can find it here: <http://dx.doi.org/10.1016/j.celrep.2017.03.079>). They studied the complete genome of each breed. The closest dog to the wolf was confirmed to be the Basenji. Next are the Asian dogs, like the Akita and Shiba Inu. Martin stressed that we are talking about *genetic proximity*, not similarities in appearance or behaviour. At the other end of the scale, furthest away from the wolf genome, are all the bull breeds. These are genetically the most modified, and they are closely related to each other, which indicates that at some point the decision was made to breed them with these attributes. If you face a greyhound standing next to a bull breed, the impression you get is that if you blow on the tall and narrow greyhound it will keel over. But the low, squat-shaped bulldog is not such a pushover! It can be deduced, though it has not been scientifically proven, that bull breeds were bred for stability and the ability to manoeuvre quickly.

Chase et al. in 2002 showed that the cross-section of the long bones in sight hounds is elliptical, whereas that in the bull breeds is circular. Bone develops in response to strain. So if there is a favoured direction of strain (e.g. moving forwards), the shape of the bone develops that way (even the skull of the whippet is long and narrow). The round shape of the bones in the bull breeds indicates that the forces are coming equally from all directions. In these dogs the skull becomes

shorter and the pelvis broader. It is probable that breeding was more focused on manoeuvring and not so much on a short skull, but the two seem to be linked. Selecting for one also gives the other.

In Germany, efforts are being made to restore some degree of health to the bulldog. They are getting a bit more of a snout. But interestingly, the body shape is changing as well and becoming less compact. Even from the front, the chest is getting narrower. This also has an effect on behaviour, because the typical flat, squat bulldog has more problems than most breeds communicating with other dogs. It is believed that within 15–20 years, this problem could be solved with the efforts ongoing in Germany.

A WORD ON BRACHYCEPHALIC DOGS

A sample of skulls of brachycephalic dogs

It doesn't take long to change the skull of a dog. The famous "shark head" nose of the bull terrier was accomplished in less than 40 years. Interestingly enough, in brachycephalic dogs, olfaction is only reduced very slightly. The space for the brain is not much reduced either. However, the olfactory and respiratory air flows are distinct from each other (Brent A. Craven et al., J. R. Soc. Interface 2010;7:933-943). One flow, higher up, is for olfaction, and the other one, lower down, is for breathing. That means that when a dog is sniffing, it isn't actually breathing. It flaps the nostril so that the maximum amount of air is directed upwards for olfaction. In normal dogs, the incoming air passes a massively convoluted nasal epithelium, which provides a surface area equivalent to 6 m2. This moist area provides cooling. Brachycephalic dogs have far less of it and as a result have problems keeping cool. Many people think that the tongue is how dogs keep cool, but in fact it is the snout that does the work. The tongue only cools the dog when there is a breeze. This is why an English bulldog needs to be placed on cooling pads at ambient temperatures above 23–25°C, or it will overheat and die. French bulldogs have slightly more tolerance but not much.

LUMBAR SPINE MOTION

When you walk behind your dog, you can see that the pelvis moves. This movement varies more or less depending on the breed. Remember when you see this that the movement of the pelvis is the result of the other movements discussed above. The pelvis is not moving the limbs; it is being moved by them. In a healthy dog, the force from the tip of the toe (the ground reaction force) passes into the leg, into the pelvis and then into the spine. In a dog with lumbar spine problems, the transmission of force into the spine is interrupted. The limb gets negative feedback and the dog moves differently. This is also why young people move differently from the elderly. The rotation of the pelvis is three-dimensional and consists of roll (axial), yaw (lateral) and pitch (sagittal).

There are seven lumbar vertebrae, but the most important ones are the rear ones. It's the same in humans; our most critical ones are the lowest. In both humans and dogs, 80–90% of back pain occurs in these last vertebrae. Then comes the sacrum, which is essentially fused vertebrae. The place where the last lumbar vertebra meets the sacrum is the lumbar-sacral junction.

Each movement of the pelvis equals some loss of power. The pelvis is fused with the sacrum, so the force from the movement goes into the sacrum. The force from the complete hind limb, including the pelvis and the sacrum, is transmitted to the spine to move the body forward. And astoundingly, based on the matching of X-rays and skeleton, there is virtually no movement between the vertebrae. This would probably be true of a galloping dog, but the Jena team would not take the risk of having a galloping dog on a treadmill. Other smaller mammals have been studied, and it is clear that galloping comes from the lumbar spine. In small mammals, half of the step length comes from the back, because the back curves up and down (remember what a cheetah looks like at high speed). Interestingly, the last intervertebral disk, closest to the sacrum, has a different shape. It is much thicker. Therefore, it has to compensate for more mobility. When a dog has problems in the lower spine, most often it will be in the lumbar-sacral area. And it will have problems galloping.

When a hindlimb moves, the muscles on the opposite side of the back activate. It is the same in humans.

BONES

We often think of bone as similar to stone: a hard, immobile material. But it is not.

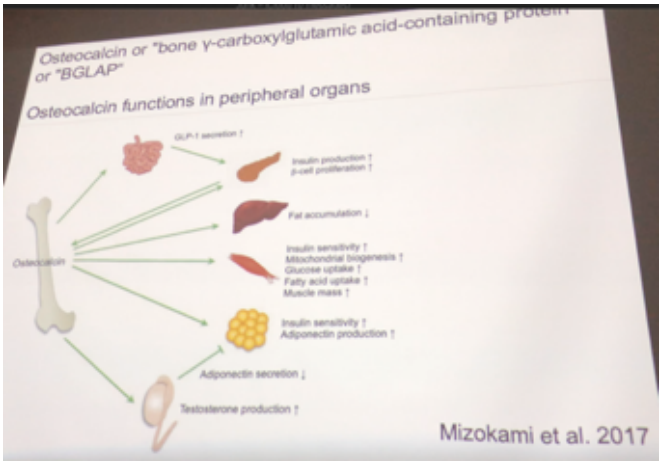
Humans under the age of 37 undergo bone remodelling, but after this age it stops. Every year, you replace a minimum of 5% of your bone when you are young. A 15-year-old does not have the same bone as a 25-year-old. After the age of 37, degeneration outpaces any bone formation. The degenerative process cannot be stopped, and it occurs more in females than in males. However, the process can be slowed down; the only way to do that is to move. It is not the intensity of the stimuli that counts, but the frequency (i.e. it is better to lift 10 kg ten times a day than 100 kg once a day). This is true of all mammals.

Tissue continuity

Bone is mineralised connective tissue. The minerals are beautifully aligned to respond to the load. In people who

have been bedridden for e.g. 6–8 weeks, the alignments change. Bone is reactive to what you do in your daily life. Because we are bipedal, the bone of our femur is organised differently to that of a dog.

Osteocalcin



The role of osteocalcin has been known for 40 years. It is a hormone produced by bone. Who would have thought that bone is a hormone-producing organ! As the diagram shows, it has an astounding effect on our body, including the production of insulin. That is one reason people with diabetes are told to keep moving. It is the same in dogs. And, seven years ago, a study in mice found that males reproduced better when they had higher osteocalcin levels. The way a male mammal moves seems to have an impact on the vitality of its sperm cells.

Based on findings from the past year, osteocalcin has been shown to have the following properties:

- It promotes spatial learning and memory and prevents anxiety-like behaviour;
- Maternal undercarboxylated osteocalcin acts directly in the offspring to regulate embryonic brain development;
- Osteocalcin is sufficient to improve cognition in aged mice; and
- Probably G protein-coupled receptor 158 mediates the functions of osteocalcin in the mouse brain.

It could be that the level of activity in dogs and their anxiety levels are related.

Osteocalcin is produced in developing bone cells. However, bone cells are only built when there is a stimulus. Osteocalcin will only be produced by osteoblasts (developing bone cells). That is why it is so important to move. This even has an effect on cognition, and it is the same for the dog.

These are recent findings, and they are striking.

A WORD ON JOINTS

When we talk about joints, we should always start with the joint capsule. Each joint capsule is hermetically sealed. If the joint is punctured, it is a nasty matter, letting in bacteria among other things. But it is even worse if the puncture happens within the same species. A human puncturing a dog's joint may not cause as much harm to the joint as the joint being pierced by another dog, because the bacteria are different. The inner world of the joint capsule is intended to remain sealed off; it is a system in its own right.

Within the capsule is the synovial layer, which, again, has to do with motion. The synovial layer secretes the synovia, a tiny bit of liquid forming a film, which in the dog is about 4 ml. The human knee has about 8 ml. It has a mechanical function, which is to prevent the bone surfaces from rubbing, but it also has another one: nutrition (see summary from 2017, nutrition of cartilage). The cartilage has to be nourished by the synovial fluid, and this can only happen through loading of the joint. Therefore, feeding of the cartilage is directly proportional to the amount of motion by the body. Not moving leads to calcification of the cartilage, which is irreversible. It is the basis of arthrosis. There is some hope, from recent developments, that stem cells could play an important role in treatment in the future.

Remember:

JOINTS ARE NOT MOVING

They are moved!

Joints require movement through their full range of motion to maintain health. But what is the entire range of motion of a joint?

Martin reminded us, in closing, that the range of motion in the dog's limbs is not that much, as we have seen. The point is that arthrosis in the humeral head starts where there is no loading. A standing dog has about 30% of its body weight on the front limbs, which is very little loading. Walking, it is closer to 50%. Even then, there are only very small areas that are loaded. In Germany, it has been found that guide dogs, which mostly only walk, have the highest levels of arthrosis in their limbs compared to other dogs. A dog running alongside a bicycle also has far too little areas of loading. There is hardly any difference whether we are walking our dog on the leash or running him alongside a bicycle; it is not the motion dogs need. A dog has to run off leash and be able to move naturally, as it wants, fast and with curves. This is the only thing that ensures maximum loading in the right areas of the joints.

Martin finished by showing us an X-ray movie of a dog with hip dysplasia. The ball of the femur literally moves in and out of the joint. It is not known whether it causes pain, but it was quite shocking to see.

As in 2017 when Martin was last here, we all went home with a greater understanding of how our dogs move, what we put them through when this understanding is lacking, and how we can help them have a better life.

Thank you, Martin!

A knotty Problem: Stress and the groomer's

Kirsty Grant
United Kingdom

For the last 10 years, Kirsti has run a one-to-one grooming business from her home in Wiltshire. Her aim is to change standard routines, habits and environment to reduce the stress that dogs often experience during these visits, and educate their guardians and other dog professionals on how this can be achieved. She has always had a passionate interest in understanding dogs' lives and behaviour, which led her to Turid's IDTE in 2016. In June 2018 she opened a canine enrichment unit in Swindon, an area with one of the highest reported instances of dog bites. Kirsti's aim is to offer dogs a safe opportunity to develop and enjoy investigating with no demands, and to offer their guardians the opportunity to learn observation skills and expand their understanding.

PART 1: GROOMING

Kirsty began with a brief background of her work, first as a groomer in different environments, then for the past 10 years grooming at home on a one-to-one basis. In 2016 she started Turid's education, which had a life-changing effect. As part of her final project she posted an anonymous survey for professional dog groomers on the UK's largest Facebook group. Within a few days she had received over 400 responses and the results were shocking.

The survey asked how often dogs showed various stress behaviours. The results are summarised in the table below.

	Daily	Weekly	Monthly	Yearly	Never
Peeing or pooing	119	148	103	37	25
Showing teeth or growling	57	176	140	42	17
Snapping, biting or scratching	83	162	127	45	16
Excitedly running about or fidgeting	240	136	46	3	6
Barking or whining	186	149	78	11	9

Many trainees spend large amounts of money and months or years of hard work learning to become groomers, only to be left with huge gaps in essential understanding of dog behaviour, communication and needs. This has led to serious welfare issues for the animals entrusted to their care and poses a hazard to both dog and groomer.

Kirsty encouraged us to think of ways we could offer education and support to our local groomers. Also, coat care should be a vital part of the training and education we offer our clients, so we can prevent dogs being put into these situations unprepared and unsupported.

Can visiting the groomer ever be stress free?

For most dogs, probably not. There is always going to be some element of stress involved, even if it is at a level the dog can manage. Kirsty gave as an example the fact that she doesn't like going to the hairdresser. She feels trapped and confined, the hairdresser takes too long, she doesn't enjoy the smells or the mirrors, and she feels vulnerable. This despite the fact that the hairdresser is very nice, and the situation is neither uncomfortable nor painful. Yet for Kirsty it is stressful. In the same way, many people hate going to the dentist, even if the dentist is very nice and the environment is calm and relaxing. For the patient, it can still be a stressful event.

For most dogs, the grooming process is somewhere between the hairdresser, the doctor and the dentist. It is quite invasive, there is a lot of physical closeness and handling involved, and there may be some discomfort. Unlike us, who choose to visit the hairdresser or dentist, the dog doesn't have that choice.

So why do it??

If it is going to be stressful, why don't we just stop doing it? For some dogs that is absolutely the right choice. For dogs with low or self-maintenance coats, caregivers who can do the grooming at home in small stages is ideal, if it is done correctly. However, time and time again and with increasing frequency, groomers are seeing horrible cases of matted fur. Kirsty showed us a matted pelt that she had shaved off a dog. The surface was lovely and soft, but underneath was a bed of tightly matted fur that looked like wool that has been boiled, tumble-dried and squeezed through a mangle. (Although this may never have happened to the reader, the writer of the summary ruined an expensive pair of socks that way!)

Severely matted coats are a very common occurrence and becoming more so every year. Groomers are seeing a dramatic increase in the population of dogs with high maintenance coats living with people who are not maintaining them.

Matting is not just unsightly; it constitutes a serious health and welfare risk. It is uncomfortable, it impedes movement and causes pain when it is moved. It constricts the blood vessels, reducing circulation particularly to the extremities. Severe matting can cause flesh death in the ears, toes and tail. The area between the pads can become stony with mud, grit and matted hair, causing painful movement and changes to the gait and increasing the risk of fungal and bacterial infections. It can conceal injuries, illnesses and foreign bodies. It prevents normal function of the coat, instead trapping damp, heat, spores and parasites within. Matting around the hygiene areas can trap faeces and urine, leading to infection and even flystrike. Matting is not just unsightly; it constitutes a serious health and welfare risk. It is uncomfortable, it impedes movement and causes pain when it is moved. It constricts the blood vessels, reducing circulation particularly to the extremities. Severe matting can cause flesh death in the ears, toes and tail. The area between the pads can become stony with mud, grit and matted hair, causing painful movement and changes to the gait and increasing the risk of fungal and bacterial infections. It can conceal injuries, illnesses and foreign bodies. It prevents normal function of the coat, instead trapping damp, heat, spores and parasites within. Matting around the hygiene areas can trap faeces and urine, leading to infection and even flystrike.

It doesn't matter who takes responsibility for keeping the coat groomed and healthy, but someone has to. It is a vital part of a loving and bonded relationship.

What's in a coat?

Hair and hair growth is a hugely complex subject that is not fully understood, even by people who have spent years studying it in minute detail. Kirsty outlined a few basic facts about hair to help us understand why some common problems might occur and why we are seeing a dramatic increase in the issue of matted dogs.

Hair is a filament that grows from a mini-organ under the skin surface called a hair follicle. Hair follicles are also a repository for stem cells that manage the repair and regeneration of the skin layers. Dogs have compound follicles that can produce several hairs at the same time.

The *coat* is the name given to the mass of hair covering the body. It has several important functions including protection from the weather, thorns and vegetation, insect bites and stings, bites from other animals, and trauma. It provides insulation by trapping air close to the skin as part of the thermoregulatory system. It assists in visual communication, e.g. through piloerection (for example hair standing up on the back of the neck). And it can provide camouflage.

D*own* is the undercoat or secondary coat. These hairs are finer, softer and often kinked. Their job is to trap tiny pockets of air and provide cushioning. Guard hairs are thicker, glossier, straight and longer, and their job is to provide a sturdy waterproof covering. These are the hairs that are raised in piloerection.

The rate of growth, life span and shed of hair are controlled by genetics, nutrition, sex, hormones, age, daylight hours, temperature, stress, medications, health, grooming, and friction or injury.

Hair: five growth cycles

Hair has a life cycle that is divided up into four main stages, with a fifth being a relatively recent term.

Anagen – Growth

This is when new hair grows. Dogs such as Poodles, Bichons and Maltese Terriers spend most of their time in anagen. Poodle hairs spend around 98% of their lifespan in anagen.

Catagen – Regressing

Hair growth stops, and the outer root sheath attaches to the hair shaft.

Telogen – Rest

The hair remains stable. For most coats this is the longest phase. Cold climate breeds such as the Nordics can spend several years in this phase, enabling them to conserve energy rather than expending it on continuing to regrow new coat.

Exogen – Shedding

The hair falls out and the follicle moves back into anagen. This is affected by seasonal and temperature changes but also by health factors.

Kenogen – empty

This is a hair follicle that has passed through exogen but remains empty for a time before moving back into anagen.

Down hairs generally work on a six-monthly cycle, a denser crop for the winter months and a lighter one for summer. Guard hairs have a lifespan of several years. Some are shorter, some are longer, but all are subject to environmental pressures. Follicles are at different stages all over the body, for the very good reason that if it was all shed in one go the dog would be cold, wet, naked and vulnerable for a few weeks and would have to expend a huge amount of energy on re-growing all the necessary coat. To put it into perspective, some 30% of a dog's nutritional intake is spent on hair.

Human Meddling

Dogs have been subject to an intensive selective breeding process by humans who wanted to preserve and promote

changes that they valued. Many modern breeds are incapable of maintaining a healthy, functioning coat without help. A Dingo has a strong guard-coat layer and padding provided by the undercoat. Because the straight, short guard hairs allow the shedding undercoat to easily work its way out of the coat, undercoat hairs can fall, be scratched, nibbled or rubbed out. The Golden Retriever, by contrast, has different-length guard hairs (some curly and others wavy), heavy feathering and a dense undercoat. The shed undercoat hair finds it harder or impossible to work itself free of the longer, curling hairs and can become caught by the new hair growing in. Lack of care commonly leads to tangles and matting in the areas around the bottom, chest and ruff.

The Poodle (remember their hairs spend most of the time in active growth) has a coat made up of guard hairs which do not produce a seasonal shed. Poodles have no undercoat, but they gain protection and insulation from the tight curl of the guard hairs. If not well maintained, the hair can become entwined back on itself and mat into lumps and dreadlocks. However, for the most part, these breeds are fairly stable and conform to a known type from quite predictable lines. They are low to medium/high maintenance and it is quite easy to get fairly accurate research about what to expect.

Then came the doodles

The original reasons behind the deliberate crossings of Poodle and Labrador are well documented, but the subsequent boom in population is very relevant to groomers. Nowadays there are other breeds that have been crossed with Poodles. These crosses have aspects of both parent breeds to varying degrees, but what commonly results is some form of long growing, dense, often curled or wavy coat which produces a six-monthly seasonal shed. Often this leads to the shedding hair being trapped within the curled guard hairs, unless they are carefully removed manually.

A high percentage of these coats require medium to high maintenance. In a recent survey, almost half of all groomers' clients were listed as Poodle crosses. With massive price tags, the demand for puppies from these crosses has been horribly exploited by unscrupulous breeders, leading to many dogs being bred from anxious and stressed mums, in poor conditions with no attention to welfare or puppy development. Added to this we have the intense marketing of these dogs through image-based media such as Instagram and Facebook. They are being heavily targeted towards first time dog owners, active and busy families with young children, or as service or support dogs. All too often, these dogs are being chosen based on an image that isn't realistic. It is extremely common for there to be a lot of distrust between doodle owners or breeders and groomers.

A typical story

A new client brings in their six-month old doodle for his first groom. The breeder has told them that no grooming would be needed for six months, so the dog comes in with hair that is matted over half of the body including the legs, bottom, ears and face.

The young dog has to endure a long appointment with uncomfortable handling to remove mats. The client is horrified and embarrassed by the dog's new appearance and goes home feeling upset and angry. The groomer is slammed on social media. Meanwhile the client, despite being offered tools and advice by the groomer, does nothing but allow the hair to regrow. Four or five months later, they repeat the same thing with a different groomer.

This situation has devastating effects on the dog's wellbeing. Fortunately, it is totally preventable. Trainers, behaviourists, vets and massage therapists can all help to improve these dogs' lives by building a support network of professionals in their area. They can offer troubleshooting sessions to help people improve their dogs' routines and environments. And they can promote individuals who are dedicated to working in a way that supports and respects the dog.

How can we help?

Kirsty went through a list of several things owners can do to help their dogs get the most out of the grooming experience. First, they can do separate work on improving the dog's experience of the car if that makes them stressed. Even better is to find a groomer close enough to walk to in a nice, calm way. Good coat management would help the dog tremendously as well, especially avoiding matting of the hair.

If there have already been negative experiences, a new "Day One" can be set with a new groomer, or a distinct way of doing things, so the dog can start a different learning experience. Social visits, which Kirsty also went into, play an important role, and daily health checks (running one's hands over the dog, checking that everything is in order). And of course a nice, calm, sniffy walk and ensuring all the dog's basic needs are always met.

Ideal first visits

First visits of around 20–30 minutes are best done at the start or end of the day. Kirsty does them for free, but one of the problems one sees increasingly is the devaluing of professionals' time. People are less willing to pay, but it is an investment in the dog's comfort and wellbeing.

Enriched environments are incredibly important, and Kirsty devoted the second half of her talk showing us her amazing setup. During a first visit, the owner stays for a cup of tea and a chat, and while observing the dog, Kirsty takes detailed information about the dog and the person's expectations and hopes. There is a designated toilet area, which they introduce to the dog. Finally, the dog does a treat search or

is given a chew, so that he is starting to build the association of calm enjoyment with the location.

Depending on the dog's personality and experience, this stage can be repeated until the dog is comfortable; it can also be done following any stressful visits.

The second visit lasts 30–60 minutes. If they will be grooming in a separate area, they move into that area. Kirsty has another calm, friendly and happy dog (her own) on the table beside the dog being groomed. The new dog is allowed to investigate without placing any demands or requests on it.

The sounds and routines are introduced one by one in a controlled way, watching and responding to the dog's feelings. Soft bedding and chews are provided as well.

Handling and physical proximity

Looming and leaning over the dog by the groomer, or the dog being picked up or restrained, can be hugely stressful — not to mention previous associations, the smell of other fearful or stressed dogs, and even possible stress or pain in the groomer. Pain in the dog can be worse if the coat is knotted or matted, and the dog may more sensitive to certain parts of its body because of injuries or for other reasons. The dog may have previous memories of pain during trimming and/or nail clipping, especially if the quick was cut. Some dogs have experienced cuts on their body as well.

Panic can occur if too much is asked or demanded from them, they feel rushed or pressured, or are moved into stressful positions. Kirsty illustrated that holding up legs can be very uncomfortable for the dog; imagine holding out your arms in front of you for even a short time. Holding the neck at various angles can also be a horrible experience.

The way foreword

We can help by **recognising, respecting and responding** to the dog's needs, and *especially* stepping back from the 'naughty' label when the dog doesn't "behave". There needs to be a better awareness among groomers of dogs' emotions, needs and language. We can give the dog a **choice**. Simply by allowing the dog enough time and ability to control the experience, we usually find that he is willing to accommodate us.

There should be **no restraints or muzzles**. These set groomers up to fail, as they ensure that the groomer will take less notice of the dog's communication. If a dog routinely needs to be muzzled in this environment, they are already past what is suitable for that dog; they need to take a step back and come up with a more holistic plan. If necessary, this should include working with the vet to use medication/anaesthesia. Kirsty does this in some cases that are very difficult, so she can work for longer on a dog without compromising anyone's safety or forming a negative association in the dog to the groomer and the environment. Compulsion is sometimes the lesser of two evils when looking at an immediate welfare need. We may have limited choice in how we can help, but it is up to us to leave as much choice as possible or to minimise the impact. For example, with a severely matted dog, leaving them ungroomed for several more weeks isn't an option. But could we do social visits every other day for a week and then groom over two or three days? Could we overshadow the most stressful elements and work on them as a learning process later? The absolutely best way to help the dog is **preparation and maintenance**. All happy grooming starts at home!

The process

Whether being groomed at the groomer's or at home, the first thing to have is a comfortable, stable table. If it wobbles, is set too high so the dog can't get off, or there is not enough grip, the dog may feel insecure. And remember, no one should lean over the dog.

The groomer can help by:

- Grooming on the floor if the dog is more comfortable there.
- Using a non-slip surface. Yoga mats can be cut to size easily and clamped to the surface.
- Setting the table low enough for the dog to jump on and off safely. If there is a hard floor, padding round with towels or beds is an option.
- Having a clear route on and off. The dog shouldn't feel that the only way off is through the groomer.
- Blocking two sides where the groomer is not, to prevent the risk of falling. The fourth side is for the dog to get off when he wishes.
- Having no restraints (this is hugely important and probably the hardest one to sell to most groomers).
- Sitting down, which lowers the groomer to a less threatening position and prevents looming and leaning over the dog.
- Positioning at an angle to the dog to lower the risk of intimidation.

Bathing

Hair must be always clean before grooming. Brushing and clipping dirty, matted hair increases the risk of causing pain, damage to the follicles and skin leading to infection. Plus it destroys blades and scissors.

Slippery, plastic, metal or enamel surfaces are slippery even when dry. The more insecure the dog feels, the stiffer he will be while trying to grip the surface with his nails.

The coat is designed to keep water out and protect the skin from intrusions. A hard stream of water can be very unpleasant. Imagine wearing nice, soft, clean, cosy woollen socks every day for several weeks, then someone ripping them off and running their fingernail up the sole of your foot. The water temperature should be close to or slightly warmer than skin temperature. No dog likes being bathed with a hose; swimming and water play are different, as the water is often not touching the skin directly.

Many products used for dogs are scented for human purposes, which is a sensory onslaught for dogs. Not only that, but they alter the smell of the dog, which is a critical part of their identity and communication.

Start with water directed over the hand and then begin to massage in, introducing the sensation gradually.

Using a bathing brush or zoom groom removes most of the undercoat, cuts down on the time spent drying and brushing after the bath, and ensures that the shampoo is rinsed from the entire coat. Using a conditioner on longer coats or parts of the coat means that tangles are less painful to brush out later.

Cutting the nails should be done in the bath if possible, to avoid another stressful event later.

Wicking towels draw more water out of the coat than regular towels.

And finally, allow the dog to shake as often as he wants, it helps!

The coat must be dried both for health and grooming, as clippers will clog in damp hair. Remember that dryers are very noisy! Kirsty went through several types of dryers used by groomers and the problems they can cause with noise and heat. Air pressure, noise and air flow can be extremely stressful, especially for dogs with upright and large ears. Also, the dog may already have sound phobias. Sometimes, using a hood or snood can help muffle sound. Dryers should be used for short durations because of the noise.

Large changes in temperature can also shake the dog's thermoregulatory system, which is particularly hazardous for young dogs whose system hasn't fully matured or old dogs whose system might not be as effective anymore. Dogs with short snouts may also have a diminished ability to maintain a safe body temperature (see Martin Fischer's segment on brachycephalic dogs on page 7).

It is important to take as many breaks as the dog needs, and there should be appropriate ventilation to try to ensure that the temperature of the room remains steady. The dog should be closely monitored for any signs of heat stress.

The dog should be allowed to take as many breaks as he needs and also to lie down during drying if he wishes. Chews, lickmats or Kongs can be a nice accompaniment, but if done right, most dogs will doze or even fall asleep!

Clipping and trimming

Clippers only go underneath mats, not through them. The result will be as short as the mats are tight. With matting, there is increased danger of cutting. If the coat gets the care it requires at home, the dog will not have to endure six or eight weeks' worth of grooming in a 2-hour visit.

Groomers and owners both want a good-looking result, BUT the dog just wants to be free of pain and discomfort. It is important to manage expectations; a less than perfect finish on a happier and more relaxed dog is a much better outcome than a perfect finish on a stressed and overwhelmed animal. It is helpful to keep the coat at a length that can be maintained within the dog's comfort level and owner's capability. Owners should also be made to understand that grooming out large areas of mats is unfair to the dog and a violation of their trust.

Like hairdryers, clippers can be noisy.

Care must be taken when handling sensitive areas of the dog's body, particularly if they are also painful. Areas where extreme caution must be observed, and over which the dog is most protective, are the eyes and face, folds and crevices, bottom and hygiene areas. These areas are critical for the dog's survival and he will defend them if necessary. Preparing the dog to be comfortable with touching of those areas may pay off huge dividends during vet visits as well.

Chin rests, or letting the dog rest its chin on the groomer's hand, and gentle touching around the eyes, ears and areas they can't see can be very helpful.

Aftercare

Aftercare is often ignored but is very important! The dog should be offered a drink and the possibility to relieve itself. Chews or treat searches bring down stress levels. If appropriate, the dog can have some social time with other dogs.

If the owner left, upon their return they should always come in and sit down for a few minutes; this gives the dog the chance to say hello and then go back to what he was doing before. It is also a chance for the groomer to talk over the groom, flagging up any concerns or informing the client if any aftercare will be needed. For example, should all the nails be done, or should the dog come in for some short nail visits? Does the dog need more social visits? Were there parasites, infections, injuries, changes in the coat that might indicate something that needs a vet's attention? Has the dog lost or gained weight? Was that what the owner was trying to achieve? Did the hygiene areas have to be clipped very short, is there a risk of irritation, and what should the owner do? All of this helps manage expectations and problems.

After leaving the groomer's, the dog should be allowed to rest and not be subjected to long or fast exercise. He should be kept in a nice comfortable temperature for several hours to allow the body to acclimatise properly, especially if it is a young or older dog.

PART 2
ENRICHMENT ENVIRONMENTS AT THE DOG NOSE

In part 2, Kirsty took us through her setup of enriched environments in a place she has rented for the purpose. When choosing the place, these were the criteria:

She had to have sole use, so she could leave the basic environment set up and store all the elements. It had to be indoors; this gave her scope to run appointments for dogs to escape the weather. It had to available 24/7, and it had to be secure. It had to be easy for dogs to move from the parking area to the unit, and also importantly she had to be able to pay for it out of her existing income.

These are the things that make up her enrichment environment, to which dogs can come with their owners:

- **Elements at different heights:** Platforms & ramps; boxes, steps & pedestals; shelves & bookcases; a doll's house; and car or lorry tyres (cleaned to remove dangerous chemicals).
- **Things to go under and through**: Tunnels; hoops; washing lines; alcoves, under desks, baskets, a play house and a ball pit.
- **Things to go over**: Poles & walking sticks; crunchy materials (e.g. a space blanket); tarps; a sandpit; ladders, a trellis and wobble boards.

It is important to stimulate the five senses:

TASTE

One option, which is not always good because it can cause frustration, is commercial food puzzles. Regardless of whether it is a commercial puzzle or one invented at home, these are a few foods that can be put into them provided they are suitable for the dog: It can be a mixture of soft fresh meat, either roast or steamed; a hardboiled egg; steamed fish; small pieces of dried meat; natural chews such as ears; dried fish; strips of skin; tendons; and very small amounts of cheese, sausage or ham.

Alternatives to commercial puzzles include rummage boxes (with shredded paper or balls), tubes, boxes, egg trays, stacking cups, baskets, towels, or food hidden on shelves or in a tunnel.

Tasting platters offer a possibility for the dog to explore and taste various small quantities such as teas (camomile, lemon balm & peppermint); fresh spices like ginger & turmeric; powders like green-lipped mussel, glucosamine & spirulina; honey; kefir & goat's milk; oil or seeds like flaxseed and coconut oil; fruits including apple, blueberry & raspberry; vegetables (peas/beans, carrot, parsnip); and seaweed.

These have to be safe, so if in doubt, leave it out. They should only be tiny pieces, or half-teaspoons of liquid.

SIGHT

Dogs are optimised to see movement in low light, and they have a limited colour palette. So when setting up an enrichment environment, we should look at it from the dog's perspective, using their colour range to indicate items of interest.








Blues and yellows will pop out from the background. Mirrors, running water and reflective surfaces can be fascinating, as

are moving items like wheels, rockers and wobble boards. Lightweight things that move with the airflow provide an alternative source of interest.

SOUND

This can include gentle audio tracks, hanging wind chimes, toilet bells, stringed instruments, keyboards, maracas and tambourines, and sounds made by blankets and plastic sheeting.

TOUCH

And for touch:

- Traces of food
- Rummage boxes still contain the scent of past treats
- Old food containers, empty coffee jars, pizza boxes, take-away paper bags
- Items with porous surfaces that get touched and not washed
- Belts
- Hats
- Shoes
- Hairbrushes

A few more ideas:

- Knobbly balls or toys
- Carpet,
- Leather
- Plastic/vinyl – tablecloths
- Canvas
- Metal
- Wood
- Bobbly/fleecy
- Rubber
- Sand
- Astroturf
- Water
- Fur and feathers
- Bead curtains, hanging scarves to brush through
- Items at different temperatures
- Digging areas

- Scent cloths
- Scent of other animals
- Cat toys and beds
- other dogs toys
- Smell of puppies, blankets
- animal hair trimmings – horse, goat
- Tack, old numnahs or sheets
- Feathers or pellets, speak to pest control or hawk center
- Novel creatures
- Friends who have bunnies, ferrets, chicken
- Game dog waxes
- Paper plates + essential oils – warning
- Everything and anything has potential!
- Car mats + door mats
- Wheelchairs or wheeled trolleys
- Foliage and herbs - in pots or loose
- Spices
- Cones
- Garden furniture and toys
- old bike tyres
- bags and suitcases
- Gardening equipment, trowels, gloves
- Vet smells, groomer smells

Managing humans

Always assume that however carefully you think you have thought things through and laid stuff out, there is a dog out there who will find the gap in your plans!

- No aversive equipment
- Dog shouldn't have had excessive exercise
- The dog should have had adequate opportunity to toilet
- The dog should not be hungry
- The dog must be allowed to rest for several hours afterwards

Time allowances

- Wherever possible the dog gets to set the time.
- Most visits are between 40 and 50 minutes
- Signs they are ready to leave are almost always very obvious!
- Standing at the door or checking in at the door twice in a couple of minutes
- Obvious signal to the human, getting up on the lap, nudging a bag or lead
- Showing signs of destructiveness for 'non-fun' or non-edible items like plastic, or shredding fluffies and fleeces

After what Kirsty shared, I'm not sure I would ever want to leave her wonderful enrichment place!

Be creative and let each dog teach you :)

K9–5
Happier dogs in the office

Stephanie Rousseau
Ireland

Steph Rousseau is a dog trainer and behaviourist based in Dublin, Ireland. She set up Steph's Dog Training in 2014 whilst living in London. In the course of her work there, she became aware of the increasing number of dogs that were going to work with their humans. She observed commonalities in the sort of problems these dogs and their people were reporting and wished to look at the phenomenon of dogs in the workplace in more detail. Much information exists on the benefits to humans of having dogs in the workplace, but there has been less focus on how the experience is for the dogs, the advantages and disadvantages for them, and how life as a canine colleague can be optimised.

Her book, Office Dogs: The Manual*, was published in 2018/19 and offers guidance and practical advice for employers and dog owners alike, whilst prioritising the office dog's welfare.*

Stephanie opened the session by explaining how she came up with the idea of happier dogs in the office. She was meeting quite a few clients who were taking their dogs to the office and experiencing problems, so because she had to do a project as part of Turid's IDTE, she decided to make this her topic. She thought that having one's dog along at work would be such a good thing, if it could be done properly. She put together an ebook, which is on her website. Unfortunately it is in Norwegian, but the English version should be coming out this spring.

As background, Stephanie explained that work places are changing, and employers are looking for ways to motivate their staff to spend more time in work. At the same time, employees are changing too. Millennials, who currently dominate the work force, are less likely to be married or living with partners, but they are more likely to have pets than any other generation. If employers can do something to facilitate that, it will give them an edge. As many as 75% of Americans, for example, have dogs.

The benefits (to humans) of a dog-friendly policy

Studies on having dogs in the workplace have shown that the benefits include reduced stress. Stress is a major contributor to employee absenteeism, and one that is expected to rise over the coming years. Along with this benefit is increased job satisfaction. This is a very important consideration for employers, who need to raise their level of competitiveness.

There is increased cohesion and team satisfaction. Having a pet at work lowers blood pressure in stressful situations; there is increased social interaction and improved mood; and recruitment is enhanced, rasing employee productivity.

Human Resource decision-makers are often asked about pet-friendly policies. One study showed that staff were 53% more likely to stay with a pet-friendly company. Most of the people Stephanie has met are small-company employees doing a wide variety of tasks. It sounds promising, and it should work for everyone, but it clearly doesn't.

Stephanie told us about a little dog whose owner had only got him once she knew it would be OK at the office. Everyone thought it was great to have a puppy in the office, and initially it started out well. When he was about 5 months old, the cracks began to show. He was, of course, doing things puppies do, like stealing things from people's bags. Colleagues started suggesting he should be crated because they were tired of him stealing their hair brushes. When he was put in a crate he barked, which is understandable, so he was let out. The owner started using treats, but some of her coworkers objected because they felt it wasn't hygienic and would attract mice. So he was only allowed to eat out of his bowl. It wasn't working for the dog, or the owner, or her colleagues.

The objectives of Stephanie's research were are follows:

- To establish what being an office dog really looked like for the dogs in question;
- To try and figure out what was going wrong for dogs for whom going to the workplace was not working;
- To provide a useful resource for people who do, or are considering, bringing their dog to work.

Her first step was to do a survey of people who do bring their dogs to work. This was to establish e.g. the dog's routine, any possible stressors, any problems owners were having; and how colleagues were responding.

THE MOST INTERESTING FINDINGS

As with many pet dogs, office dogs were not getting enough sleep and having inappropriate exercise (lots of ball play and often too many walks). Many people would come to work on the bicycle with the dog running alongside. Most people perceived that their dog enjoyed going to the office. The most problematic behaviours were separation anxiety, for example when the owner had to go to a meeting, and barking behaviours. Most owners thought their colleagues found having a dog in the office better than expected. Most owners found bringing their dog to work was as difficult as expected or more difficult. This was not really surprising, because the owners had generally not taught their dogs any skills that would be helpful to being in the office. None of the respondents had done any preparation for the dog coming to work.

THE PEOPLE

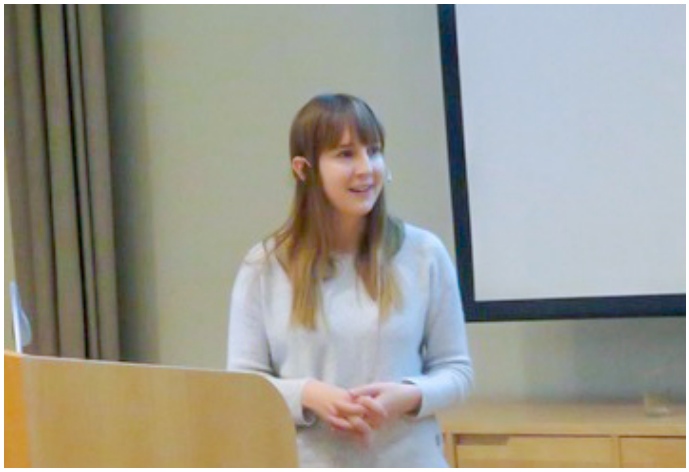
Stephanie then wanted to look at the general population to see how people felt about dogs being taken to work. She did a survey of general workers to establish people's attitude to dogs in the workplace, what would make it work for "non-doggy" people, and what changes people would be willing to make to make it work.

Findings:

The findings can be summarised as follows. Of the people who responded:

- 77% had dogs, 23% did not.
- 81% were in favour of a dog-friendly policy (this was higher than expected).
- 46% of those who answered would bring their dog to work, 29% would bring them sometimes. That was lower than expected.
- 92% of those in favour of having dogs in the workplace said they were open to changing their behaviour to accommodate the dogs; although frankly this doesn't seem to be the case in practice.
- 83–90% of people in favour of having dogs in the workplace were willing to attend training events on topics such as canine communication, making the office work for both dogs and humans, and fun and healthy activities for dogs. Stephanie also took this with a pinch of salt; the lectures that she has given in workplaces certainly haven't had that level of attendance.
- Of those who were against having dogs in the workplace, the most common reason was that they thought the dogs would be disruptive or a distraction.
- Other reasons included not liking dogs, being allergic, and not feeling the work environment was appropriate for dogs.
- Of those against having dogs in the office, 20% would change their mind if there were dog-free zones;.
- A further 30% might change their mind if this was the case.

Now that Stephanie had more information, what was becoming clear was that it wasn't just about reducing stressors for



the dogs; people needed to be managed too, for the environment to be friendly for the dog. She decided to create a resource for people who wanted to take those steps.

THE PRACTICALITIES

The first thing she looked at were the practicalities. The first part of the book deals with what to think about before you bring your dog into work. The second part is about making it nice for the dog. This involves concerns for employers, gaining support from colleagues and decision makers, and understanding the company's policies.

Concerns for the employers

Employers tend to be quite risk-averse to anything new. A major concern for employers is that if something goes wrong, who will be responsible? What happens if a dog bites someone or destroys equipment? One of the things owners could do to mitigate that is to have the appropriate insurance and to sign an agreement taking responsibility for any damage the dog might do.

Does the lease allow animals on the premises? Then there are cultural sensitivities to consider. This is where dog-free zones could be a good idea.

Then, 15–30% of people with allergies are allergic to cats and dogs. Some of the allergens will linger where the animal has been, even after it leaves. Also related to health, some people may be concerned that dogs carry zoonotic diseases like parasites. It is important to have dogs appropriately vaccinated and treated.

There are trip-and-fall hazards, but here dogs are not more likely to cause problems than other things on the floor. Common sense on the part of the owner, like where to place the dog's belongings, can help mitigate some of those concerns. Some people have phobias and, again, a dog-free zone can be helpful. Finally, some people may worry about whether the dog will display aggression or bark or destroy things.

GAINING SUPPORT FROM COLLEAGUES

This is not about blindly getting support. Colleagues should not be coerced into agreeing with the plan. There has to be honesty about what having a dog in the office will entail. It is better to get it out in the beginning than when all the arrangements have been made. And because some people

may feel uncomfortable being "the only one in the office" who doesn't want to work with dogs around, finding ways to provide anonymity is a good idea.

PLANNING THE PRACTICALITIES TOGETHER.

These are some of the things it is worthwhile working out with colleagues ahead of time:

- To what areas will the dog have access?
- Are other staff members willing to remove items from the dog's reach that they don't want him to have access to?
- If a behaviour becomes problematic, are people willing to take a united approach as decided by the dog's owner?
- Is the dog's owner willing to take ownership of any problems and endeavour to solve them?
- If any issues arise with the dog, will people raise it with the dog's owner first? In one case Stephanie mentioned, the owner was hearing about the problem from Human Resources rather than the colleague.
- Is there a policy for introducing new dogs? If a new dog is brought in and doesn't get on with the other one, which one gets to stay? Is there a possibility to have the dogs in different parts of the office?
- Are there any behaviours that would be really problematic and represent a deal-breaker?

Funny things also happen with dogs around, and Stephanie shared some of those with us.

POLICIES: WHAT TO EXPECT

In 2017, a study found that 65.9% of people allowed to bring their dog to work were not aware of a specific policy relating to this. Where policies did exist, the most common criterion determining whether or not dogs were allowed was their behaviour. Other stipulations included certain days or certain areas where the dog was allowed.

Stephanie said that she had spoken to several companies about their policies. One company, Kurgo, had their employees who brought a dog to work sign a policy indicating that all liability for damage or injury lies with the owner. They had to agree to clean up after their dog and to ensure that vaccines were up to date. The dogs had to be toilet trained and able to behave with new people and dogs. If the dog(s) could not be trusted to behave off-lead, the owner had to agree that they be kept on lead or in an office/cubicle. Kurgo has a great setup: they built cubicles from timber reclaimed from the river, as shown in the picture on this page.

Another company, called Barkbox, has the following policies: Being a dog lover is an employment criterion! Again, dogs must be up-to-date with vaccines and "well trained". There was some kind of age and size requirement, which they did not specify. A great idea they had was a "free-for-all" floor where dogs could be off-lead most of the time, and an on-lead floor for dogs with inter-dog issues.

Amazon in Seattle can have up to 500 dogs on their premises on any given day. Each employee must discuss with their manager and colleagues in their immediate working area.

The employee submits a registration form for their dog and provides proof of vaccination, and dogs sit with their owners at their desk either on leash or in a penned area.

Stephanie went through several other companies, some of which have policies dictated by the leaseholder rather than the company. They are pretty similar to the others, and include additional policies like not allowing dogs into food-preparation areas.

PLANNING YOUR DOG'S DAY IN THE OFFICE

People need to be aware of how stressful a day at the office can be for a dog. Travelling by public transport is a big factor. It must be awful for a dog to have to scramble onto an underground train at the peak of rush hour. They can be subjected to stressful environments in the workplace including noise, busy places and restricted movement. Some people have the idea that once a dog gets to the office, it should just sit there for eight hours. Not getting enough sleep, and being forced to interact with many people (especially on public transport!) can be stressors in their own right. Dogs spending all day in shops are subjected to a constant stream of people coming in and out. And in addition to an inappropriate routine, many owners have unrealistic expectations.

Planning the journey

The first thing is to play the journey to work. Where possible, and if the dog is young and healthy, a nice calm walk into work might be the best. This means allowing plenty of time so as not to march the whole way and arrive frustrated because the dog wanted a good sniff on the way. Also if driving, the dog needs to be given time to stretch his legs and do his business before entering the office. People do need to be told these things, even though it may be evident to many of us. Stressors like car sickness can play a major role in how the dog will cope at work. Or perhaps being in the car itself is hugely exciting, with winds the dog up.

Public transport, as mentioned earlier, can be hugely stressful, but if it can be taken off-peak this will help; some companies allow flexible work hours. Also, we need to protect our dog from unwanted attention. In summer the chosen mode of public transport may be too hot. The dog should be habituated at his own pace. Suddenly subjecting him to an hour on public transport may be distressing.

A suitable spot at work

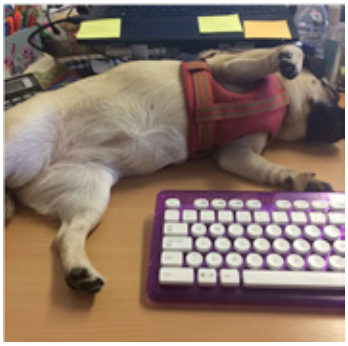
Can the dog choose where to be? If not, the owner should choose wisely, considering the dog's proximity to the owner, the temperature of his environment, noises, sights, and general busy-ness in the area.

BE CAREFUL WITH NOISE!

This picture from Stephanie's book can be used as a poster or sign to ask colleagues to be mindful of the dog's presence. Quite a lot of people are naturally noisy and don't pay attention to sounds. But a dog's hearing is way more sensitive than ours. The owner can also help the dog by:

- Reducing the ring volume on their phone;
- Positioning the dog's bed away from loud noises. Even simple things like photocopiers and printers may be constantly humming in the background and be particularly noisy when they start printing;
- Avoiding taking the dog to meetings, where things could get heated;
- We may not be able to control what others do, but the owner can start with their own contribution.

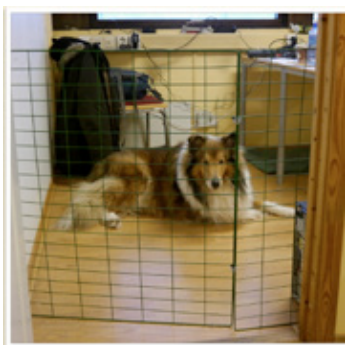
SLEEP!



Dogs need anywhere from 12 to 20 hours' sleep in 24 hours, 40% of which they get during the day. They need plenty of space to stretch out and spots where they will not be disturbed. It's a bit too much to ask for silence in an office, but basically the dog needs somewhere private, away from machinery as mentioned above. Also, the dog needs company; it should not be sleeping away somewhere on their own.

BARRIERS

There may be a need for barriers in some situations. A dog may be comfortable in a crate, but should not be there all day as a means of constraint. Barriers should be used wisely, to keep the dog with the owner, or to block their view of things they might find stressful. The dog in this picture is in a work environment where there is a lot of machinery that could pose a hazard. He can still see what is going on and can be part of the office. Initially he was very restless, so every time he got edgy the owner took him for a little walk and sniff. Initially she had to do this a lot, but now he is so relaxed some people have asked if she drugs him!



MENTAL STIMULATION

After listening to Kirsty, Stephanie thought that many offices have spaces that are not used and it would be brilliant if they could be used for a small enriched environment. Colleagues would probably be more than happy to donate to the effort.

THINGS TO DO

Things should be brought for the dog to do, like chews, food puzzles etc. If there are other dogs, a social walk at lunchtime might be appropriate. The dog can also have opportunities to visit friends, either canine or human. Going on a little adventure with the owner, either in or outside the building can be fun. One dog's owner is an architect who does site visits, so the dog goes along when possible. Another owner is an estate agent, and if the owners of the properties he visits don't mind, the dog goes inside to look around. But remember, dogs spend most of their day sleeping!

THINGS TO AVOID!

Some people make the mistake of thinking that if they can give their dog a lot of physical activity at lunchtime, he will be physically exhausted and be calm throughout the afternoon. We already know from listening to Martin Fischer's talk on dog movement that this is not the case. Not only will the dog not be tired, except for a little while at the beginning, but he will be full of stress hormones, which in the long term will contribute to problem behaviour. Hormones also have the ability to mask any pain, meaning that further injuries can be caused by a riotous lunch break.

FOOD

The dog's food should be good quality, not full of sugars or colours etc. that can affect behaviour. It's a great idea, if appropriate, if the dog can participate in coffee breaks with the owner. They should not have to earn their food throughout the day. A dog that is constantly wondering what he can do next to earn a bit of food is not going to be relaxed. Access to water should not be forgotten!

ELIMINATION

Dogs pee more if they are excited or stressed. It is important to show the dog where to go, because especially in a new environment where lots of things are happening, it will not be clear to him where he can relieve himself. Be prepared for accidents. Perhaps a colleague can be trained to help for times when the owner is in the middle of things or has to be in a meeting.

Don't have a strict schedule! If in doubt, bring them out!

LESS CAN BE MORE

Stephanie told us of an elderly Labrador who had severe arthritis and slept almost all the time. Her owner carried her up to the workplace, down again at breaks so she could relieve herself, then back up to the office. The dog was able to spend her final days sleeping beside her owner rather than alone at home. That was all she needed.

SOCIAL CONTACT

Social contact is good, but there can easily be too much of it, or the wrong kind. The poor dog might be handled and picked up or patted on the head etc. It is more risky having a one-off occasion and bringing the dog in for a day. The owner needs to protect the dog from too much interaction, and it is crucial to educate colleagues!

CHOICES

Choices help the dog deal with the new environment. It gives them back some sense of control and encourages them to think before they act. Choices also help the dog build self-confidence. The owner can let the dog decide, where possible, where to go on walks and where to sleep. The dog should be able to choose whom to interact with, whether to go somewhere or not, or even whether to come to work. There should also be a choice of treats and chews. The main thing is to let the dog choose, and to have a backup plan in place in case bringing the dog to work isn't possible for some reason. Dogs may benefit from an occasional office-free day, and owners may too!

USEFUL SKILLS

Stephanie rounded off the session by going through a few of the skills both owners and colleagues should have, like understanding calming signals. One question Stephanie asked in her survey was whether the dog had had any training to prepare him to come to the office, meaning of course the skills he would need in order to cope. One funny answer went: "I never want a dog that does tricks, but he knows how to heel, come back, sit, stay, wait, be gentle, get down, go to bed, and drop it. Once he can do them he's good." That wasn't exactly what Stephanie had in mind! Coping skills are a way of life, they are not something we can teach them, it is something we need to create for them.

Things we *can* teach them are calm sessions, the hand signal, and how to leave certain things alone (like a colleague's lunch!). If the dog likes doing certain things, like carrying objects, the owner can occasionally ask them to e.g. take a pen to a colleague, to keep it fun. It's a good way to win over colleagues; who can resist a present brought by a dog?

Stephanie gives talks in work places on how to interact with dogs in the office. Colleagues will be helped by understanding canine body language, how to use human body language, how to greet dogs, and how dogs' senses work.

In Stephanie's book she gives an example of a poster that can be put on the door of the office, to remind people how to behave.

COMMON PROBLEMS AND TROUBLESHOOTING

Stephanie goes into more detail about it in her book, but she summarised some of the main issues as follows:

One of the main things people complain about is so-called alert barking, where the dog reacts to people coming and going. Giving people skills to deal with it is helpful. This can include blocking (by the owner or a colleague), using the hand signal, using a visual barrier, positioning the dog so he is not exposed to the issue as much, and accepting that *some* barking is normal for dogs. In different countries, what is considered acceptable may differ. In London, people tend to be less accepting of occasional barking than in Dublin.

Another issue that can arise is dogs not settling down. The dog may never have been taught to settle down, they may be over-exercised/stimulated, they may be in pain or stressed or bored. Or they may need something simple, like relieving themselves or having something to eat. And for some dogs, it just doesn't work. The environment may not be that dog friendly, even if dogs are allowed. The best solution may simply be to seek alternative arrangements. One owner Stephanie knows brings her dog in just one or two days a week, depending on the situation at the office. Other days, he is at home or with a friend or at doggy daycare. But for a lot of dogs, with a bit of thought it will work brilliantly!

REMEMBER TO GET STEPHANIE'S BOOK, OUT IN APRIL 2019!