

# Harnesses for Agility Dogs

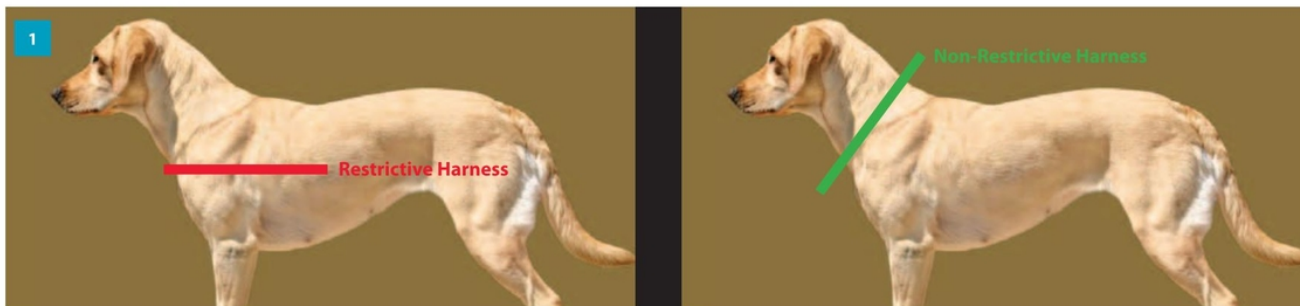


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Photos by Clean Run

Multiple different styles of harnesses are available for dogs and their use is becoming more and more popular. There are harnesses that have been developed to help manage behavioral issues such as pulling, jumping, or leash aggression. Harnesses have also become quite fashionable, now being available in a number of different customized colors and patterns. How-

ever, while these harnesses may look flashy and/or help prevent or correct poor behavior, recently they have been under fire for potentially altering canine gait, which could place abnormal stresses on the soft tissues and boney structures of the dog's limbs.

Dog harnesses can be broadly defined as either *restrictive harnesses* that cross over the bones of the front leg or *non-restrictive harnesses* that cross the body in front of the front leg bones. See **Figures 1-3**. It is postulated that restrictive harnesses that cross over the bones of the front legs restrict gait by limiting shoulder extension and forelimb excursion. Some believe that this alteration in gait could potentially predispose dogs to injury, particularly shoulder tendinopathies.



Restrictive harnesses cross over the bones of the front leg as shown by the red line. Non-restrictive harnesses cross the body in front of the front leg bones as shown by the green line.



These are examples of restrictive harnesses, which cross the body over or below the shoulder joint.

## How Harnesses May Alter Gait

Some gait characteristics can be altered significantly while wearing a harness.

Most owners and handlers do not observe an obvious alteration in gait while their dog is wearing a harness. However, visually observing subtle changes in gait can be difficult. Pressure-sensing walkways have been validated to analyze gait characteristics in dogs and can detect subtle gait alterations. Pressure-sensing walkway measurement systems objectively analyze gait data quickly and provide a number of temporal (timing) and spatial (distance) gait parameters. See **Table 1**. This form of objective gait analysis can be used in a clinical setting to aid in diagnosing orthopedic, muscular, and neurological disorders that affect gait. It also can be used to analyze the effects of various factors, such as harnesses, on gait characteristics.

A recent study was conducted at Veterinary Orthopedic & Sports Medicine Group in Annapolis Junction, Maryland to evaluate how five commercially available harnesses affect canine gait characteristics at the trot using a pressure-sensing walkway. The restrictive harnesses used for the study were the ComfortFlex® Sport Harness, the PetSafe® Easy Walk® Dog Harness, and the Julius-K9® IDC® Harness. The non-restrictive harnesses were the Balance Harness™ and the Dog-Games® Original Fleece-Lined Harness. The Balance Harness has both a front and rear clip for the leash, but only the rear clip was used in the study.

To control for different sizes and styles of movement of different breeds of dogs, and because the breed is so commonly used for agility, this study used 10 healthy Border Collies. For each dog, three passes trotting across a pressure-sensing walkway were recorded either with the dog on a leash and collar or on a leash attached to the harness. In all cases, the leash was held loosely so that the dog was not pulling. For each dog and each harness, the following variables were measured or calculated for each passage: total pressure index percentage (TPI%), stance time percentage (ST), stride length (SrL), and step length (StL) (Table 1).



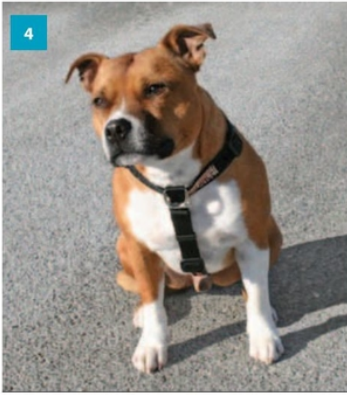
**Table 1. Temporospatial Gait Analysis Parameters**

Temporal (timing) Gait Parameters	Spatial (distance) Gait Parameters
<p><b>Gait Cycle Time</b> is the elapsed time between the first contacts of two consecutive footfalls of the same foot, measured in seconds.</p> <p><b>Stance Time</b> is the time elapsed between the first contact and the last contact of one identified paw, expressed in seconds (e.g., the amount of time the dog spends with their paw on the ground).</p>	<p><b>Total Pressure Index Percentage</b> is the sum of peak pressure values recorded from each activated sensor by a paw during mat contact (e.g., how much pressure a dog is placing on each paw).</p> <p><b>Stride Length</b> is measured on the line of progression between the heel points of two consecutive footprints of the same foot (e.g., left front foot to left front foot).</p> <p><b>Step Length</b> is the distance between the heel point of one foot to the heel point of the contralateral foot (e.g., left front foot to the right front foot).</p>

The results of this study demonstrated that wearing a harness affects gait. Interestingly, regardless of the harness type, some dogs were found to be highly reactive to wearing a harness. In fact, even dogs who had been wearing harnesses most of their life and that were thought to be well accustomed to wearing a harness were still found to have significant alterations in gait while wearing a harness, regardless of the type of harness. Overall, wearing a harness was also associated with a longer forelimb stride length, shorter forelimb step length, a greater forelimb total pressure index percentage, and a shorter forelimb gait cycle.

In this study, some harnesses were shown to affect gait characteristics more than others. In particular, dogs reacted most strongly to the Julius-K9 IDC Harness, which was classified as a restrictive harness, and the Dog-Games Original Fleece-Lined Harness, which was classified as non-restrictive. Interestingly, these two harnesses had the most surface area touching the dog's bodies. In contrast, the Balance Harness, which was the most adjustable harness and also covered the least amount of the dog's body surface area, appeared to affect gait characteristics the least.





**4** *Harnesses that are non-restrictive and highly adjustable are thought to affect gait the least. Such harnesses typically are structured such that bands encircle the neck and meet a central band at the front of the chest, forming a “Y” when viewed facing the front of the dog’s body.*



**5** *Given the wide variety of shapes of dogs’ bodies, ideally a harness should be adjustable along both sides of the neck and the body as well as along the back and along the sternum.*

**Recommendations for Choosing a Harness**

It is important to consider how harnesses can alter canine gait when selecting a harness for your dog.

If your dog must wear a harness (for example, because he has having a medical problem with the cervical spine, larynx, or trachea), it is important to choose a harness that will affect gait the least. Harnesses that are non-restrictive and highly adjustable are thought to affect gait the least. Such harnesses typically are structured such that bands encircle the neck and meet a central band at the front of the chest, forming a “Y” when

viewed facing the front of the dog’s body. See **Figure 4**. Given the wide variety of shapes of dogs’ bodies, ideally a harness should be adjustable along both sides of the neck and the body as well as along the back and along the sternum. See **Figure 5**.

For these reasons, we recommend that the selected harness fits the dog appropriately—the three sections of the Y should meet at the front of the dog’s sternum so that the pressure is supported by the dog’s entire rib cage—and that the harness is worn only when necessary. See **Figure 6**.

**Recommendations for Wearing a Harness**

Gait alterations caused by a harness may contribute to long-term repetitive strain, which could either cause or predispose dogs to injury. Thus, it is recommended that dogs not wear harnesses while training, conditioning, or competing. However, if it is necessary for the dog to wear a harness during any of these activities, an objective gait analysis should be performed with the dog wearing the harness to identify any gait alterations. If gait alterations are identified, the harness should be adjusted (if possible) to minimize these alterations and mitigate their effect.

**6** *Make sure the non-restrictive harness you choose fits your dog properly.*

*Only the girth strap of this Y harness is adjustable. Although the three sections of the Y meet at the front of the dog’s sternum, the neck band is too low so it crosses over the top of the dog’s shoulder.*

*This Y harness crosses the dog’s body well above the shoulder; however, the lack of adjustability in the front or neck strap causes the center of the Y to be well above the front of her sternum.*

*This Y harness is adjustable along both sides of the neck and body as well as along the sternum (there’s no back adjustability). The center of the Y is at the ideal point and the harness crosses the dog’s body above the shoulder joint.*



**While further studies would be needed to define the relationship between restrictive harnesses and injury, harness function and the effects on canine gait should be taken into consideration when choosing a harness and performing objective gait analysis.**

While further studies would be needed to define the relationship between restrictive harnesses and injury, harness function and the effects on canine gait should be taken into consideration when choosing a harness and performing objective gait analysis. Further research is also needed determine the extent to which these gait characteristics differ with different harnesses, in

different breeds, and dogs with orthopedic disorders. Future research should also be performed to objectively evaluate if there is a way to mitigate the effects of wearing a harness.

**In Conclusion**

In conclusion, harnesses that limit shoulder extension and restrict forelimb excursion could contribute to long-term repetitive strain and potentially predispose dogs to shoulder tendinopathies. In addition, harnesses with a large surface area in contact with the dog's body should be avoided. These considerations should taken into account not only in working and sporting dogs but also in active companion dogs. 🐾

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