Sit Pretty – Core Stability… The full document!

Stop sitting pretty! – Expanded viewpoint!
https://www.fourleg.com/Blog/290/Stop-Sitting-Pretty!----Expanded-Viewpoint
March 5, 2017
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www.FourLeg.com
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See the picture… this is what we're talking about. Teaching your dog to do this is all the rage in canine sporting groups, training groups, and trick groups. People have been told that it's a good exercise for building "the core". And while it might just get your dog to activate his or her abdominal muscles, it might also be doing damage as well.

It has been 13 years since I first saw this exercise described and promoted, and at the time, my gut feeling was that I didn't like it. But I didn't know why. Over the last 13 years, I've come across research that has helped to reinforce why it might not be the best exercise. It's taken me this long to think about it, compile some evidence to support my thoughts, and because I was asked to write out my rationale by a colleague, only now am I speaking out in a very public forum.

I do not recommend 'Sit Pretty' as an exercise. Here's why:

1. It's not functional. When is this skill needed in a dog? Does is translate to any other functional movement? Do we actually know that it builds core muscles?
   Answers: Never. No. No.
   So, those who are promoting and loving this exercise are doing so based on hearsay or just because they've seen others doing it and are looking for something to add to their dog's training regimen or trick roster.

2. What happens to the facet joints during 'sit pretty'? The facet joints are the joints of the spine that control movement. With the exception of the first two vertebras, each other vertebra is joined to the vertebra above or below it (or ahead or behind, in the case of 4-legged creatures) by a set of facet joints as well as the disc. The facet joints transfer load, allow for movement, and also block undesirable movement.[1,3]
   Firstly, let's realize that the facet joints in the dog's back are designed to transfer forces from limbs to the body / spine with the dog in 'normal dog positions' (sitting, standing, lying down, and moving directionally). When a dog is in a 'sit pretty' position, there are 180 Newtons of force going through the facet joints.[2] Compare that to normal walking (approximately 107 Newtons) or standing (approximately 26 Newtons). Walking upstairs comes close at 170 Newtons, but standing erect on two-legs exerts the greatest amount of force through the facet joints. Surely there's no benefit to that!

3. The consequence of making facets do what they're not intended to do.[1] It has been reported that when a dog has more extension forces on their back that their bodies will adapt by smoothing out the joint surfaces that are being bashed together. In quadrupeds, it's the facet joints that get smoothed out and enlarged, allowing more slip and slide of the joints in extension. This protects the back from painful bashing… but it also serves to de-stabilize the spine. Essentially, the joints are no longer blocking movement, they are now allowing more movement as an adaptation of what is being asked of the body. It might sound like a good short term solution. However, when this occurs it also means the more stresses and forces go through structures that shouldn't be stressed further (i.e. the disc, or the muscles, or small local ligaments), and when this happens, the body needs to come up with another way to stabilize the area. How the body does this is by adding bone to try and stabilize (otherwise known as spondylosis). Spondylosis is when a bridge of bone is formed between each vertebra on the underside of the vertebra. While I tell people not get freaked out about the presence of spondylosis (i.e. their dog is not crippled or paralyzed by its presence) it does mean that there is an area of the back that has become overly stiff, and subsequently, a different area of the back is likely becoming too flexible to compensate. And neither is 'great'!

4. The iliolumbar ligament.[3] Who? Maybe you've never heard of it. Your dog hasn't… because he/she doesn't have one! The iliolumbar ligament is found in people. It's a strong ligament that helps to stabilize the lumbosacral junction[6] (basically the junction between the low back and the pelvis / tail bone). It is a ligament that is likely found in people and not in 4-legged animals because as 2-legged creatures we need more stabilizing mechanisms to help us stay upright! It is thought that the muscle Quadratus Lumborum is what helps stabilize the spine of quadrupeds in the absence of the iliolumbar ligament.[5] But this is a pretty thin, small muscle in dogs, so it's not likely to be providing the same stability that a strong ligament can!

5. More missing ligaments! An interesting study was conducted looking at the ligaments of quadrupeds (i.e. dogs / horses / rodents), bipeds (humans), and pseudobipeds (birds).[4] The researchers found that a set of ligaments (to the side of the vertebra in the

thoracic spine) were absent in any of the quadrupeds they studied. They speculated that these additional ligaments were a development subsequent to the mechanical challenges unique to having an erect spine. They also discussed how developmental scoliosis was not a typical problem in quadrupeds, but is a more common occurrence in humans and birds.

Essentially, being upright is associated with high facet joint forces, a higher incidence of scoliosis, and the need for additional ligaments. Dogs are not designed for time spent in an erect posture. (Nor are goats, horses, or pigs… in case you were wondering!) All in all, I can find no redeeming qualities in the Sit Pretty exercise. As such, my professional recommendation is to just stop it, and your dog will be better off for it!

References:

1. Breit S. Functional adaptations of facet geometry in the canine thoracolumbar and lumbar spine Th10-L6). Ann Anat 184: 379-385, 2002.
2. Buttermann et al. In vivo facet joint loading of the canine lumbar spine. Spine, 17(1): 81-92, 1992.
3. Evans & deLahunta. Miller's Anatomy of the Dog, 4th Edition. Elsevier, St Louis, MO, 2013.
4. Jiang et al. A comparison of spinal ligaments – differences between bipeds and quadrupeds. J Anat 187: 85-89, 1995.
5. Gregory et al. The canine sacroiliac joint. Preliminary study of anatomy, histopathology and biomechanics Spine 11(10): 1044-1048, 1986.
6. Woodburne & Burkel. Essentials of Human Anatomy, 8th Edition. Oxford University Press, New York, NY: 559-560, 1988.

ADDENDUM

Why do people want to love this exercise so much? The article above has created quite a firestorm! I posted it on my clinic's blog page and it was re-shared on a big Facebook group for people interested in conditioning their dogs (Canine Conditioning and Body Work – private group, but anyone can ask to join). I'm surprised I've not gotten death threats from it! There are people saying that my opinion isn't researched or validated, saying that their dog does it and doesn't have back problems, saying that they were told it was the best exercise for their dog's 'core' and if they trained it, it would add 2 years to their life (no joke, someone told me that they were told that in a seminar!), saying that my opinion has no credibility, saying that I am an 'old fashioned vet' (Really? When did I become old or a vet?), saying that because I have this opinion, I must not be in favour of any dog-sports or exercise of any kind, saying that I should have published a research paper if I wanted to express this opinion, and a whole host of other nastier, evil comments. And despite all of the negative comments, I've also had hundreds

of comments, e-mails, and messages saying 'Thank you for writing this Laurie, I always felt uncomfortable with this exercise.'

So, I thought, if you want flat out un-researched OPINION and CONJECTURE, I might as well continue this article then!

Part 2, why I hate the Sit Pretty (and Stand from Sit Pretty) exercise. Here goes!

A. There is not one shred of evidence out there that validates Sit Pretty as an exercise that works the core. Sitting and standing erect have not helped humans develop a strong core, why would we think it would do so in dogs? PLANK! Now there's an exercise that works the core… but that's for another blog. Now, if your knees aren't total garbage, I want you to try this yourself. Squat down, feet hip distance apart, and "make sure your back is straight upright". Firstly, your tendency is to lean forwards, why? Because in order to be balanced, you want your body weight to be distributed over your base of support (i.e. between your feet). But when you straighten your back (you are using your spinal extensor muscles). Try to get really straight and tall, you'll be inclined to throw your arms out in front of you (again to shift your body weight forwards so it's over your feet (and not behind your feet/heels). The other thing that happens is that you hyperextend in your lumbar spine to throw your weight forwards slightly (in order to get your back straight). And the lumbosacral junction in dogs in particular is very prone to lumbosacral injury. It doesn't do well with repeated hyperextension. When I try it, I feel my back hyperextending as my weight shifts backwards, and I have to try to correct to bring my weight forwards again (and maybe my abdominal flicker on to help me go forwards, along with the waving of my arms)… but it starts to get very uncomfortable on my back after a while. Maybe you won't see the repercussions of this exercise now, but maybe when your dog is 10 – 14 years, you will! Or not! But then again, there was a time when smoking was considered harmless too! My Dad was a chain smoker for almost all of his life, he's still alive at 75, so it must not have harmed him, and should be okay for anyone else wanting to take up the habit. Margarine used to be considered healthier than butter… Helmets were only introduced into hockey in 1974… and I remember riding in the backseat of the car without a seat belt growing up. Maybe we should have fought harder against changing ways back then too? (Please, oh please, note the sarcasm here!)

B. How is Sit Pretty a conditioning exercise? What are you conditioning for? The SAID principle of conditioning says that "when stressors are imparted on the body, whether biomechanical or neurological, there will be a *Specific Adaptation to Imposed Demands* (SAID). For example, by only doing pull-ups on the same regular pull-up bar, your body becomes adapted to this specific physical demand, but not necessarily adapted to other climbing patterns or environments." (https://en.wikipedia.org/wiki/SAID_principle) We also know that being able to do hundreds of sit ups as a person, does not mean you have good core stability when it comes to functional activities and movements. So, what is it you might want to accomplish with Sit Pretty? What does it lead to? How is it a functional exercise, what

does it actually improve in a performance dog? Will it help a dog to jump over a jump or for a police dog to scale a wall? When choosing a starting position from which to explode forwards or upwards, I would argue that no dog goes into a 'sit pretty' and then explodes out of it. They will lean their weight onto their rear limbs, but their body is never vertical before they burst (nor should it be)! So, I'm going to say, it's nothing more than a trick. It's not a true conditioning exercise.

C. When a dog stands up on both rear legs (i.e. looking over the fence or 'dancing'), then yes, there is an increased loading on the facet joints as discussed in the first section of this blog, and yes, it's only slightly more than climbing stairs. However, as I discussed in point A, the load in sit pretty may alter the extension forces on the spine, and while my upcoming viewpoint has not been researched by science, I HYPOTHESIZE that the joint forces for sit pretty are even higher than in standing erect. When standing erect, a dog can move his/her hind legs backwards and balance the bodyweight more directly over the feet (i.e. the base of support for the dog). This is going to enable the task to be done more successfully and with better balance. And often you will see dogs offer this over a 'proper' Sit Pretty, I think that means something. As well, when people say, meerkats, gophers, and rats do this, and so does my little dog, I think you'll see that they are actually standing on the rear legs, not 'sitting pretty' (unless they were taught it and rewarded for doing it at some point in time).

D. Facets and ligaments, why am I focusing there? I have focused my discussion on these factors because this is where there is evidence, and as a professional, I should be using the best available evidence to back up my clinical impressions and decision making. There are likely forces on the discs that are unnatural with Sit Pretty as well. Over extending in the lumbosacral junction is a real problem in working dogs of all types. Agreed. But if this exercise doesn't help that, and possible adds to it, they why be so adamant about doing it? And yes, muscles are so important for stability, not just ligaments, but to dismiss the importance of the absence of two spinal ligamentous structures in quadrupeds as compared to bipeds is simply burying one's head in the sand.

E. Squats from a Sit Pretty… I dislike this even more! When it comes to this exercise, I think it's the stifle joints that are being put at risk. A dog's stifle joint has more of a slope to the tibial plateau, and this in part is one of the proposed THEORIES as to why dogs tend to develop cruciate DISEASE (not just traumatic tears, but degeneration of the ligament over time, leading to a failure of the ligament with a somewhat innocuous movement one day). So, if a stifle is not a 'knee', then why make a stifle flex and extend while taking full body weight in an unnatural position? And yes, we could discuss the mechanics of the back getting in and out of the sit pretty, but I think the biomechanics at the stifle makes a stronger argument here. HOWEVER, if you want to put the dog's front feet up on a stool, step, ball, platform, etc. so that he/she is leaning forwards and ask for a stand, and then back down into a sit, that is a much more natural movement

for the stifle (like climbing stairs or a hill or preparing for a jump) and is therefore a functional exercise. (And yes, is should be about function!)

Beyond these points, I'd like to add that when we are choosing to do or not to do something (exercise, therapy, technique, etc.), we try to be as 'evidence informed' as possible. If we were waiting for research to tell us what to do, well then nobody would be conditioning dogs at all… since there's no evidence to back that up! However, when trying to decide what to do (in whatever situation) you use the 'best available research' to make an 'informed decision'. And that's what I've done in presenting my argument. **I only ask that people take the time to stop and think about the arguments presenting without getting immediately defensive (and nasty).** One of my Facebook friends had summed it up with *"When we know better, we do better!"*

Be sure to address the letter bombs directly to me, I'd hate for one of my staff members to be blown up for no good reason!

Cheers, Laurie

Sit Pretty… ugh, not again!

https://fourleg.com/Blog/339/Sit-Pretty...-ugh,-not-again!

February 4, 2018

By Laurie Edge-Hughes, BScPT, MAnimSt (Animal Physiotherapy), CAFCI, CCRT

Oh, my goodness, here we go again! I do not understand why folks want so much to love this exercise, despite good arguments and evidence to the contrary.

Okay, so if you don't know what's going on. Almost a year ago, I wrote a blog entitled Stop Sitting Pretty! – Expanded Viewpoint! And I took a lot of heat for coming forth to say that I disliked this exercise and why I disliked the exercise. I used 6 references to back up my thoughts, and some fairly well-thought-out arguments as well. http://www.fourleg.com/Blog/290/Stop-Sitting-Pretty!----Expanded-Viewpoint!

But let's just start with the promulgated myth that Sit Pretty is the best core exercise out there. No research has been shown to back that up. None. To make that claim, someone would have had to have done the research and compared that exercise to other exercises, and recorded muscle activation during said exercises and long term clinical findings with use of said exercise(s) (i.e. sporting function, longevity, etc.) It's not been done. NOTHING on core conditioning in the dog has been researched!

My concerns lie in anatomy. Dogs don't have an iliolumbar ligament or a sacrospinous ligament in the lumbar spine, or lateral spinal ligaments (i.e. superior costotransverse ligament) in the thorax to help them stabilize their bodies while in an upright position. That's fairly

fundamental. I also used an argument that the facet joints could get bashed into extension, which could lead to damage to the joints and/or contribute to long term instability (see the original article.) Essentially, with excessive extension, the facet joints develop expanded / increased facet joint surfaces caudally and ventrally, effectively turning their facet joints into 'ball and socket' joints (the kind of joints that would NEED more ligamentous support). Which is why the next part matters…

The latest argument uses a paper from 1992 by Butterman & colleagues to say that Sitting Erect does not increase forces on the facet joints. Let's take a closer look at that article.
First off, where they measured the facet joint strain was at the medial/lateral sides of the joint (not the ventral or caudal components… the areas that other researchers tell us are where the excessive extension forces are directed (Breit, 2002).

The first picture is from the journal article itself. The second picture is from my spine model. The blue area is the 'side' of the facet joint (essentially, where the Butterman research tested for forces on the facet joint), and the orange part is where I have concerns (the ventral and caudal parts of the joint). THOSE are the areas, that I believe sit pretty impacts. Those are the areas where excessive extension or ventral forces are imparted.

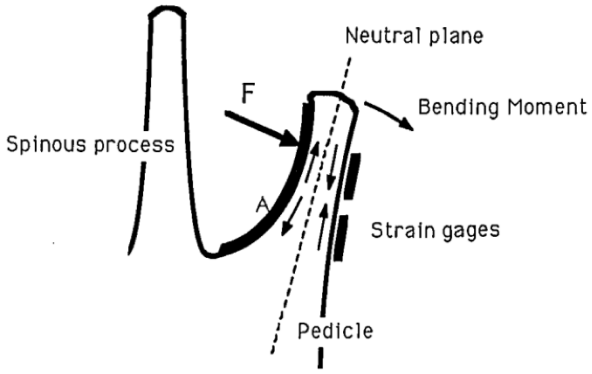

Fig 1. Diagram of cranial articular process with caudal facet, A, on the medial surface and strain gages on the lateral surface. Load, F, on the articular facet results in bending of the process with tensile and compressive strains (small arrows) on the medial and lateral aspects, respectively.[7]

The next area to discuss is that the Butterman research described their sitting erect as the dog being held in this position (allowing front legs to be supported), and that in this static position, the forces on the sides of the facet joints were only 15 – 80 Newtons of pressure. However, when they asked the dog to stand erect (with the forelimbs supported to get into position but then releasing support when they took the measurement) then the forces were 160 – 185 N. So, an erect position, without forelimb support, resulted in the highest loading of the lateral

aspect of the facet joints. So, if you are not providing support for your dog's forelimbs, you can expect that higher than 15 – 80 N of force are going through the sides (with no reporting of the caudal and ventral regions) of the facet joints.

All in all, this paper does nothing to quell my concerns about the safety of this exercise. In fact, delving into it deeper, gives me greater reason for concern! Why do I have to love Sit Pretty as an exercise anyways? Bottom line for me is, I don't!

References

Breit S. Functional adaptations of facet geometry in the canine thoracolumbar and lumbar spine Th10 – L6. Ann Anat 184: 379 – 385, 2002.

Buttermann et al. In vivo facet joint loading of the canine lumbar spine. Spine, 17(1): 81-92, 1992.

Evans & deLahunta. Miller's Anatomy of the Dog, 4th Edition. Elsevier, St Louis, MO, 2013.

Jiang et al. A comparison of spinal ligaments – differences between bipeds and quadrupeds. J Anat 187: 85-89, 1995.

Gregory et al. The canine sacroiliac joint. Preliminary study of anatomy, histopathology and biomechanics Spine 11(10): 1044-1048, 1986.

What can you do to build up 'the core' in your dog?
https://fourleg.com/Blog/291/Functional-alternative-exercises-for-the-core
March 12, 2017
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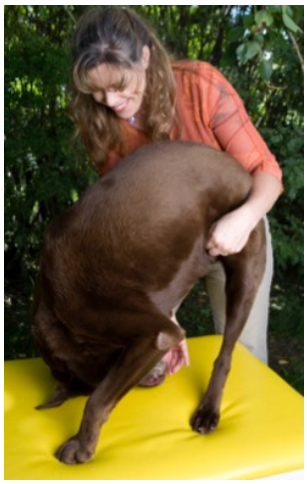
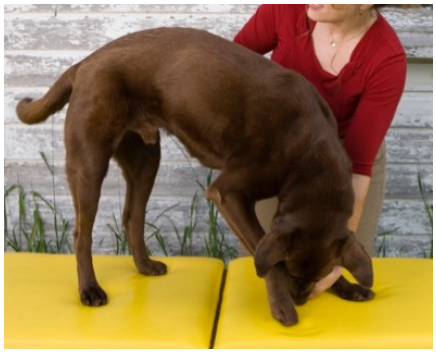
Subsequent to my blogs about 'Don't Sit Pretty', I've been asked to provide alternatives to working the core in dogs. I broke down some of my suggestions into three different categories – Beginner, Intermediate, and Advanced. This isn't an exhaustive list, but I did try to present a handful of functional and practical exercises. And no, there is no research into conditioning exercises for dogs. Unfortunately, there is a deplorable dearth of scientific information pertaining to sporting dogs in veterinary medicine. One must also recognize that training the 'core' is just one small part of overall fitness. That being said… here goes!

Core exercises for beginners

Cookies under the chest, at the front feet, at each rear foot.

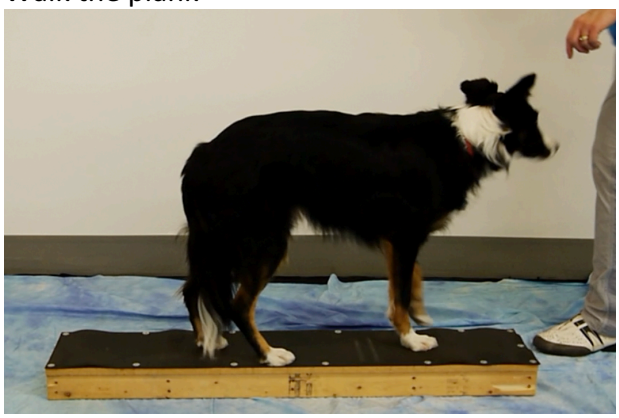

High stepping (over obstacles or through deep snow, shallow water, or tall grass)


Walking with a theraband or bandage wrapped around the abdomen

Stool standing (with all feet a bit closer together than normal)

Side sit-ups

Walk the plank



All 4-Legs standing on wobbly surface(s)

3-Leg standing on a stable surface

Core exercises for intermediates

3-leg standing with abdominal tapping

3-leg standing on a wobbly surface

Tug of war, forwards and backwards (straight line)

X-leg standing on a stable surface

(under the body, progressing to away from the body, progressing to wiggling the legs)

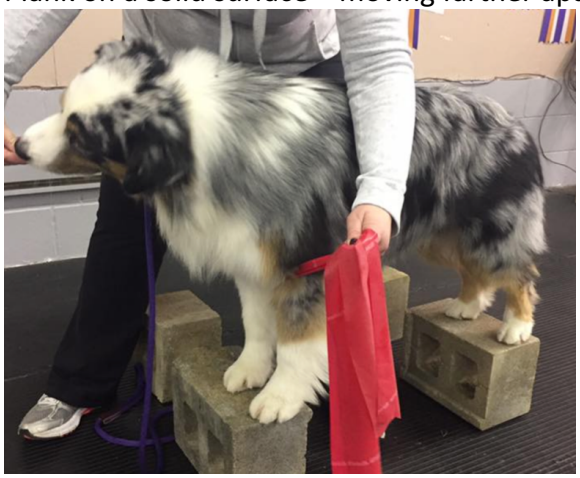
Stand and twist

Advanced core exercises

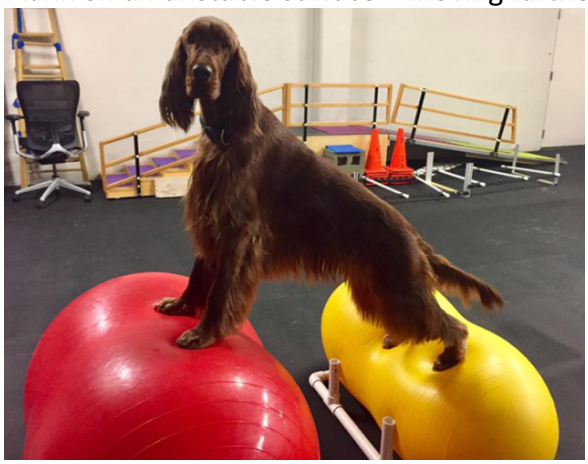
X-leg standing with limbs stretched out on a wobbly surface

(under the body, progressing to away from the body, progressing to wiggling the legs)

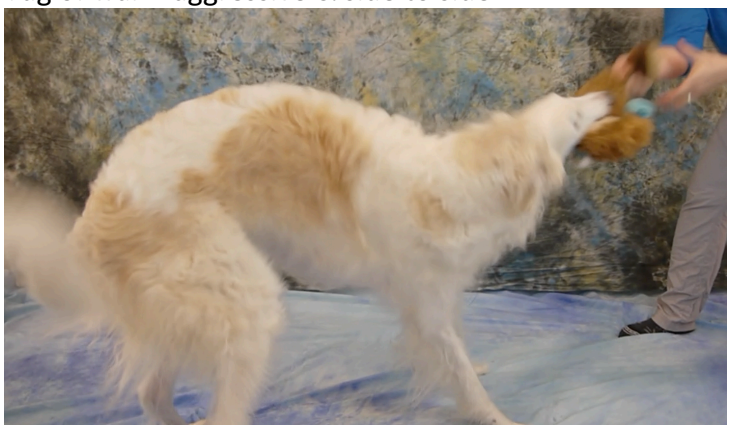
Plank on a solid surface – moving farther apart



Plank on an unstable surface – moving farther apart



Tug of war – aggressive & side to side



General activity that can build the core

- Running
- Trotting
- Hiking (hills)
- Playing Goalie
- Playing soccer
- Wrestling on the ground with another dog

And THAT should be enough to guide you through some functional alternative core strengthening exercises. Be sure to also address global and limb-specific strengthening, power, speed, agility, skill training, reaction times, cardiovascular training, and coordination as well! Have fun!