



VETADVICE  
**Leg work**



As this action shot goes to prove, a horse's tendons work extra hard and can feel the strain when jumping and galloping. Charlie Briggs (pictured) knows all about how vulnerable horse's legs are – as well as working for the Hale Veterinary Group in Wiltshire, she's team vet for the GB Endurance Development squad

**Ouch!**  
 The most common tendon to be injured is the superficial digital flexor tendon (SDFT), which runs down the back of the cannon bone

**Flexible**  
 The fetlock sinks to the ground before the tendon springs back, lifting the foot as it does so

**Stre-e-etch**  
 When galloping, the SDFT stretches by about 16%, which takes it close to breaking point

As the days lengthen and the winter blues ease, we all get a bit of a skip in our step, and that includes our horses. But how can you make sure your horse's stride stays bouncy the whole year through? If you've already started circling show dates on your yearly planner, the next step is planning a fitness programme. Whether you ride for pleasure or competition,

your focus should be on getting your horse fit to safely do the job you expect of him. Tendon strains account for a large proportion of injuries to competition horses but with a bit of know-how it's possible to give your horse every chance to stay sound. Here's all you need to know about why strains occur, how to treat them, and how to prevent your horse getting injured.

## TENDONS – THE INSIDE STORY

To understand why tendon strain occurs so frequently in horses it's important to get to grips with the structure and unique function of horses' tendons. In short, they're amazing!

The tendons in the lower leg work as springs, allowing a horse to gallop at speed with relatively little effort in the upper limb muscles. The most common tendon to be injured is the superficial digital flexor tendon (SDFT) in the front leg. The SDFT in particular is very stretchy and stores elastic energy. This allows it to recoil when released, and the release propels the leg onwards with minimal effort, ready for taking the next stride.

Tendons are made of a protein called collagen, which is arranged as long fibres in a zigzag pattern, a bit like crimped hair. This enables the tendon to lengthen as the horse places weight through the leg. The fetlock sinks and the tendon then reaches its elastic limit and springs back as the leg lifts.

Tendons have been shown to work close to their physical limits at every stride. When galloping, the SDFT stretches to increase its length by approximately 16%, which is close to the point at which it's known to rupture. The SDFT heats up to around 45°C at gallop, and normal proteins are damaged above 40°C - think of how heat



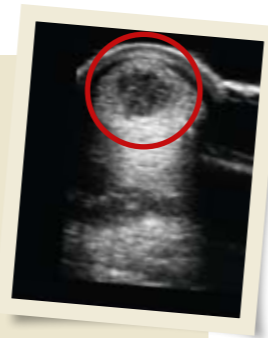
It may be necessary to scan the lower leg to confirm a tendon injury

## Spotting the signs

- **The back of the cannon may be swollen and hot and the leg may be painful to touch**
- There's often lameness, but not always, especially in a mild strain
- **With strains of the superficial digital flexor tendon (SDFT), the fetlock of the affected leg will sink low when the opposite front leg is picked up**
- The swelling can make it difficult to determine what structures are affected. Vets use ultrasound scanners to diagnose a strain and to see the damage. The scan is often delayed for a week post-

injury to allow for swelling to settle and the full extent of the injury to be seen

• **On a scan, a strained tendon will often show an increase in size, lose its characteristic fibre pattern, and may well have a big hole filed with haemorrhage in the middle called a core lesion (see photo). Core lesions can persist for several months and often go on to form scar tissue rather than tendon fibres**



affects an egg - yet tendon cells regularly endure this heat. It's these physical hardships that gradually eat away at the integrity of the tendon structure. In most cases, tendon strain occurs as a result of these degenerative changes subtly damaging the tendon over time, rather than a single catastrophic event.

## TENDON FIRST AID

Good end results rely on teamwork between you and your vet. The first few hours after a tendon strain are important and this is where you as an owner can make a real difference.

It's important to rest and support the leg and reduce swelling as the inflammation can cause further damage to the tendon.

Strict box rest in the early stages is needed to start the healing process. Cold hosing is preferable to ice packs as it increases cooling via evaporation - this should be done for 20 minutes three or four times a day in the initial stages. Anti-inflammatory drugs such as phenylbutazone (bute) are given to further dampen down inflammation.

A support bandage compresses the leg, reducing swelling and supporting the tendon. In most cases a single layer stable bandage is not enough - a three-layer dressing gives much more support and can be applied by your vet. Your vet will be able to show you how to correctly apply a bandage to avoid injury through over-tightening.

Illustration **Samantha J Elmhurst BA Hons, www.livingart.org.uk**



Careful bandaging will support the leg and reduce swelling

## TREATMENT OPTIONS

Over the years, many different treatments have been tried and tested, which is proof-positive that the perfect treatment hasn't yet been found.

Vets often use a process called tendon splitting to treat a core lesion. Small holes are made in the tendon with a needle or scalpel under standing sedation, often in combination with the injection of various substances directly into the core lesion to promote healing.

In severe cases the superior check ligament is cut to take the strain off the SDFT. This check ligament attaches to the SDFT so, by releasing it, extra tension is taken off the injured tendon. This is done under a general anaesthetic and the results are encouraging with fewer horses re-injuring following this surgical procedure.

Alternative treatments, such as therapeutic ultrasound, laser therapy or magnetic boots, also have their firm followers. From



It takes an average of nine months to return to pre-injury activities

a vet's perspective there's limited clinical evidence that they help, but their use is widespread and not thought to be harmful, so it's a matter of personal choice.

The practice of tendon firing or blistering, where a hot iron or a caustic chemical is used to burn the skin over the tendon, is known to be ineffective, extremely painful and cannot be recommended on any level.

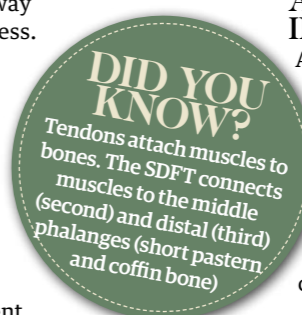
## ROAD TO RECOVERY

For a treatment to succeed it has to be given in conjunction with a controlled exercise programme, tailor-made for your horse. Here the buck stops with you as an owner! It often includes a period of box rest, followed by in-hand walking, then a gradually increasing exercise programme under saddle before allowing complete turnout. Regular

ultrasound scans along the way will chart your horse's progress.

On average, a horse won't resume normal pre-injury activities for about nine months, often longer. It's a hard schedule for any owner and requires dedication and determination to succeed.

But healing the tendon is only half the story - in a recent study, 53% of racehorses re-injured their SDFT within three years of the initial injury. This re-injury is due to the formation of scar tissue during tendon healing, which is strong but not as stretchy as normal tendon tissue. The Holy Grail of treating tendon strains is to reduce the formation of scar tissue and to create a healed tendon that has the same elasticity and function as a normal, uninjured tendon.



## Q&As Vet advice



**Bruce Bladon**  
RCVS and European specialist in equine

surgery, working at O'Gorman, Slater and Main & Partners in Newbury, answers your questions

### Q Are tendon boots a good idea?

Tendon boots may protect the outside of the leg; however, there's a growing body of opinion that they may contribute to tendon strain. The idea that they may overheat the tendon is a current theory. Many trainers have abandoned boots and believe they've seen a reduction of tendon injury.

### Q How would you treat an SDFT strain?

I often only get to see the worst cases - for these I surgically cut the superior check ligament and use stem cell injection.

### Q Can we prevent tendon injury?

Human data shows tendon injury to be age-related degeneration. The theory is that equine tendon disease is the same - not an over-strain but an age-related tendon weakness. Therefore, it's not a case of avoiding injury, but delaying it.

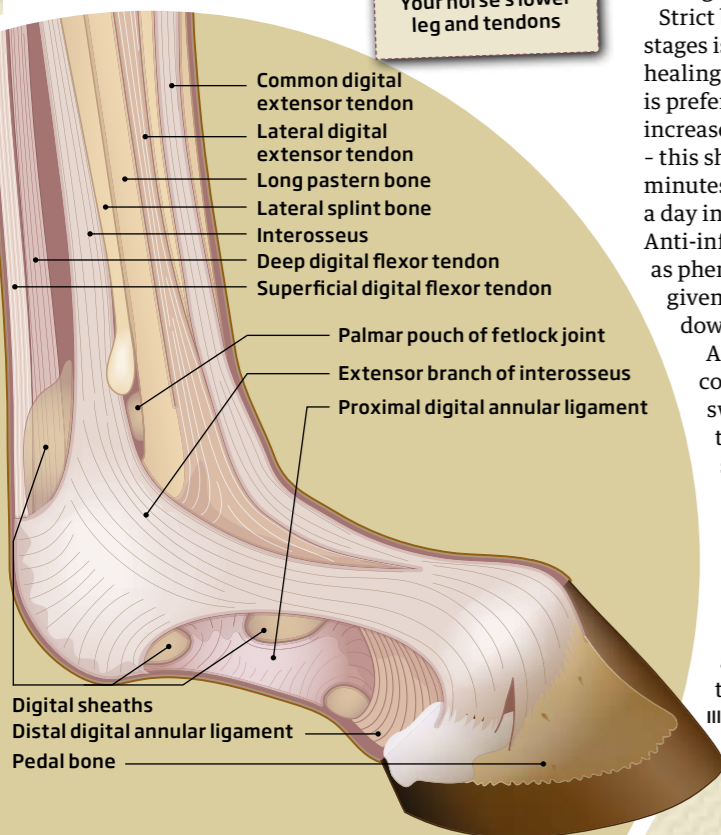
## AVOIDING THE INEVITABLE?

As you can see, once a tendon has blown, the odds are against you for it happening again. It's not always possible to avoid but this advice may just swing the balance in your favour. A host of factors lead to a tendon strain, including genetics, conformation and age.

It's thought that horses with a toe-out conformation and long toes are more likely to suffer SDFT strains. Older horses are more likely to injure a leg as the tendons become stiffer with age. Regular routine farriery helps reduce the strain in the flexor tendons - this includes keeping the toes short and the feet well-balanced.

Always check your horse's legs after exercise and note any extra heat in one leg. Cool the legs off by cold hosing after exercise.

### Full stretch Your horse's lower leg and tendons



- Common digital extensor tendon
- Lateral digital extensor tendon
- Long pastern bone
- Lateral splint bone
- Interosseus
- Deep digital flexor tendon
- Superficial digital flexor tendon
- Palmar pouch of fetlock joint
- Extensor branch of interosseus
- Proximal digital annular ligament

- Digital sheaths
- Distal digital annular ligament
- Pedal bone

# Care Tendon troubles

Getting your horse fit for the work you want to do is important. Don't be over-eager to go straight into jumping - a good warm-up gives muscles and the cardiovascular system time to get up to speed. A tired horse with muscle fatigue is a common cause of tendon strain and explains why so often a strained tendon occurs towards the end of a race or event. Make sure your horse is fit and warmed-up enough to do the job or you're asking for trouble.

Get to know your horse and be sensible. Realise when he is tiring and remember that he may not always look lame following a tendon injury. When exercising, select your going carefully - jumping on heavy, uneven ground is more likely to cause a strain.

Often a severe strain is preceded by a few episodes of mild lameness with a little heat in the leg. Heed the warning signs and you may just prevent a serious injury. 🐾

## Exciting new research

Currently, stem cell research - led by the Royal Veterinary College in conjunction with a company called VetCell - seems to be a promising development for promoting restoration of the normal tendon structure, rather than formation of scar tissue.

Stem cells are found in bone marrow and have the capacity to transform into many different specialised cell types within the body - including tendon cells. Bone marrow

is harvested from the breast bone or hip bone of the injured horse, sent off to a lab for culture and purification, then injected as stem cells back into the affected tendon. The very latest research (about to be published) has shown that stem cell therapy halves the risk of re-injury when compared to horses treated with other methods by minimising scar tissue formation. All equine vets are following this exciting research with great interest.



Bone marrow is harvested, cultured and purified, and then injected back into the horse as stem cells

Choose your ground carefully for fast work or when jumping



## It happened to me

Sarah Meadwell is a stable lass at a racing yard in Wiltshire. She inherited Winkle as a six-year-old ex-racer from a trainer and, soon afterwards, he sustained a serious strain to his superficial digital flexor tendon

“I hadn't really done much with Winkle before his injury,” says Sarah. “The first thing I noticed was that he came in from the field slightly lame. His leg was swollen and hot - and my boss knew what it was straight away.”

As with any owner, a strained tendon is a huge worry. “I didn't think the outcome was hopeful or that he would recover to do what I wanted him to do,” says Sarah.

“Winkle's rehab programme was painstakingly slow. He had six weeks' box rest, then six weeks' walking, followed by controlled exercise under saddle in the school.

“We built it up slowly over six months. It took 13 months from start to finish, at which point we felt happy to turn him out properly. He had a year with no freedom as such.”

Winkle is now back in action and thankfully hasn't re-injured

under Sarah's watch. Once bitten is certainly twice shy. “I don't jump him on poor ground and I'm very careful to feel for heat in both legs after exercise.

“It's hard, but if this happens to you, my advice is to give your horse the correct amount of time standing in. Winkle had no chance of running around and blowing the leg while it was healing. For all that time off, it has healed a lot better than I thought it would.”

**NEXT  
MONTH  
JOINT CARE**