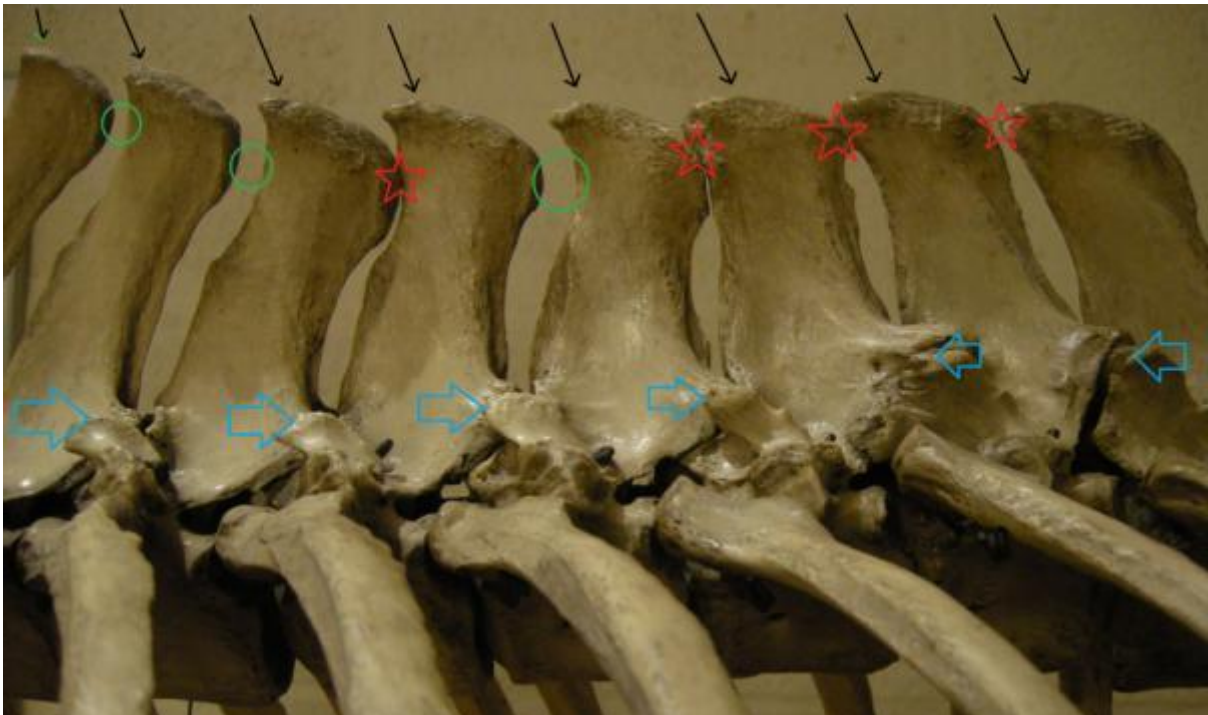


Kissing Spines FAQ

The following list of FAQs was compiled by Richard Coomer in order for his clients and others to better understand the background to back pain and kissing spines, as well as the treatment options available at Cotts. Although data is presented and references supplied, this is not a peer-reviewed paper. Readers should remember that despite their logic, some of the processes leading to problems are surmised assumptions based on the human sports medicine literature and wide clinical experience, rather than proven facts at this point in time. Richard Coomer, July 2016.

What are kissing spines?

The dorsal spinous processes of the spine (black arrows) along the back from withers to point of hip are usually regularly spaced with a gap between them (green circles). With kissing spines the spine dips and these spinal processes start to get closer (red stars). Kissing spines are sometimes called impinging or overriding dorsal spinous processes. Kissing spines is an x-ray diagnosis, but whether a horse needs any treatment for it depends on whether they have back pain.



When the bones start getting closer to each other, the tension is taken off the interspinous ligament, causing reaction in the bones and eventually fibrosis and loss of the ligament. Most of the x-ray changes seen in kissing spines are attributable to this process, but why and when the bones start to get close, no one knows. Weight in the saddle pushes the bones even closer together and in the most serious of cases the spines actually overlap. When they touch it causes pain and reflex muscle spasm around the spine in some horses, a vicious cycle that can actually pull the spines even closer together. It is normal to have a mixture of severity of kissing spines in one individual.

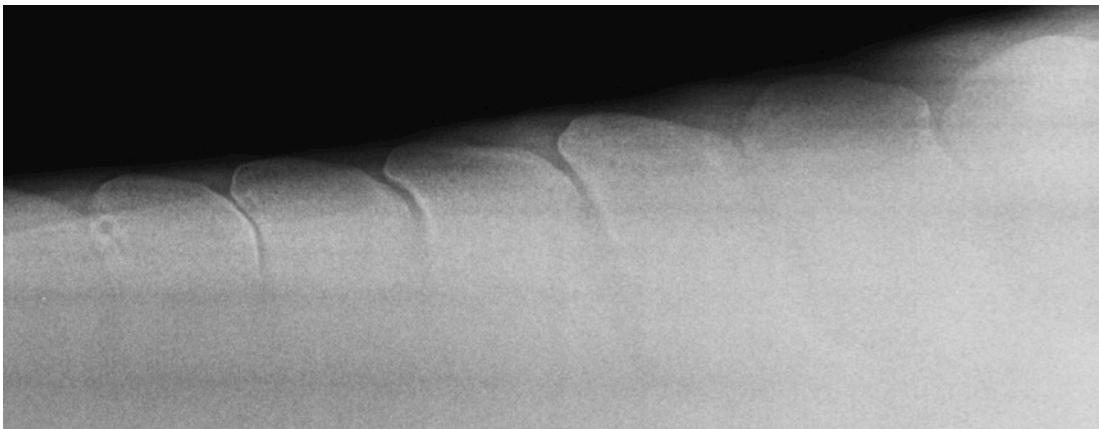
The degree of pain exhibited by an individual horse has absolutely no correlation with the subjective 'severity' of the x-ray changes. A horse can be exquisitely painful with 1 narrowed space, or be stoically tolerant with 12. The 'severity' of x-ray changes might be a marker of how long they have

been there. There are therefore 2 factors only partly related: (a) the x-ray signs of kissing spines, and (b) the degree of back pain present. Just like in people, form (the x-ray) and function (the clinical presentation) have no correlation.

I've heard that lots of normal horses have kissing spines, is that true?

It's true that lots of horses with no signs of back pain or poor performance have kissing spines. Thoroughbreds are a prime example. Regardless of whether the horse is painful, there is no doubt that kissing spines cause a functional reduction in spinal movement. During work this necessarily increases the amount of work adjacent parts of the body, such as pelvis, legs and neck have to do. Human sports medicine specialist doctors call this the 'kinetic chain model' of injury, MacIntyre and Joy (2000) – ref 5. An underlying restriction in one area, often the back, leads to an acute over-use injury elsewhere. Many horses that come to see me have this scenario at the root of their problems. It's also why I, along with quite a lot of vets, believe that kissing spines on an x-rays is always relevant, regardless of whether there is back pain present.

This kinetic chain scenario seems a very logical reason why horses pick up lameness issues: the limbs have to do too much work and get injured. Many lameness problems I diagnose also have sore backs, previously not recognised or ignored. So it's not surprising that many back pain cases I see have concurrent lameness issues on top. It's a shame more vets don't look at the back, or down-play the importance of it. In the words of MacIntyre and Joy (2000) vets....'see only what they look for, and they look only for what they know'.



Why did my horse get a sore back with kissing spines?

There are several groups of reasons for back pain with kissing spines, not necessarily causes:

1. Poor riding technique
2. Poor fitting tack
3. Trauma – a bad fall for example
4. Concurrent lameness – but chicken or egg?
5. Foot imbalance

Most horses start with muscular pain and tension in the back area. The problem is trying to work backwards from the time of diagnosis to find the cause. Sometimes it's obvious, often not.

How do you know if the horse has back pain?

There is no one sign; it is a question of putting all the evidence together. Signs of acute back pain include difficulty being tacked up, pain, rearing and bucking when ridden. Some horses get so sore that even light pressure induces an abnormal pain response or exaggerated dipping. This is called allodynia; some horses become dangerous to even approach with this problem, let alone touch the back. This can be dangerous and definitely not subtle!

More often horses don't do this. Signs seen are poor performance, including any or all of loss of ridden performance, poor jumping or bucking afterwards, breaking stride riding down slopes. Pain on palpation of the back is sometimes seen, but with some rest the pain often subsides to leave the horse with a fixed splinted back but no obvious pain. With long standing problems, the horse tends to loose topline, the muscle on the back. It also can develop compensation problems elsewhere, especially in the hind legs. Sacroiliac joint pain is common, but other lameness problems also occur.

If there is any doubt whether an x-ray finding of a kissing spine is significant, there are several options available. First is to block the area with local anaesthetic. Problem with this is that horses with no back pain also change significantly through blocking proprioceptive pathways. So this causes false positives. Getting a bone scan is another option, but it can also give false negative results. If we are not sure, rather than blocking, we tend to carry out medication with corticosteroid anti-inflammatory directly in the narrowed or closed space. They then follow a standard exercise plan with plenty of lunging wearing a postural aid, such as a Pessoa. We showed that the short-term (6 week) results of medication are the same as ISLD. The main disadvantage of medical treatment was that many re-developed back pain when the drugs wore off.

Very long standing kissing spines may get to be non-painful because the ligament fuses the bones together. This explains why some horses have severe x-ray signs with no signs of back pain. It is debatable whether these cases should be treated at all, since the pain seems likely to have passed.

What else causes of back pain?

Not all horses with sore backs have kissing spines, but it is considered the commonest cause of back pain (ref 1). Other causes include simple muscle soreness, which can develop secondary to lameness or compensation problems elsewhere in the back or legs.

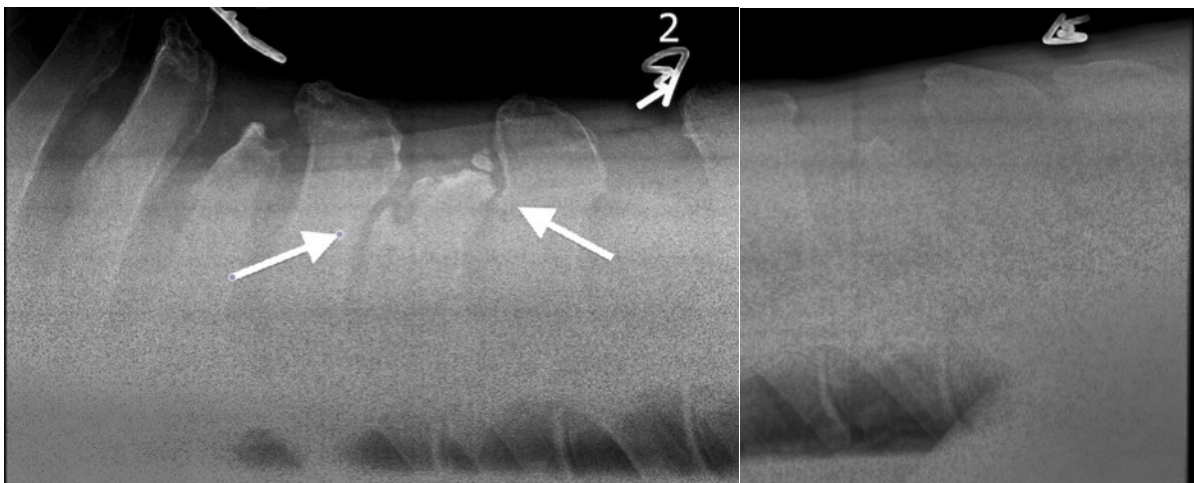
Other back problems represent the minority of causes of back pain in our experience. Causes include facet joint disease/arthritis, which are the joints between adjacent vertebrae (blue arrows on the first picture). Acute traumatic, or chronic ligament inflammation can occur, and stress fractures of vertebrae can affect young animals. Sometimes facet joint disease can accompany kissing spines and some vets think that having facet joint problems is a contra-indication to treat kissing spines. Our experience contradicts this: treating kissing spines appears to resolve back pain where they are seen on x-ray in more than 90 % of our cases. This is a classic case of where normal function and use overcomes 'abnormalities' on imaging, as it does in people with lower back pain.

How are kissing spines treated?

There are both medical and surgical options. The principle of treatment is to make the horse comfortable, then carry out a 'Pilates' type exercise regime to raise core and back strength, lift the

back and resolve spinal crowding. Corticosteroid (triamcinolone or methylprednisolone acetate) can be injected directly in space, which temporarily makes them more comfortable. Other drugs can be injected with the same aim. We then recommend a 3 week non-ridden exercise plan with plenty of walking and increasing lunging with Pessoa, latterly with trotting poles. Riding begins after 3 weeks.

Traditional surgery was the fall back option for cases which couldn't be treated medically. It completely cuts out every other spine, physically creating space there and then. It is a costly and invasive surgery with 3 month + rehabilitation periods. Although in the largest published case series (215 cases) only 3 % got wound infections (Ref 2), these were all carried out under general anaesthesia. Most surgeons carry this procedure out under standing sedation with local anaesthetic. This is apparently technically slightly easier through reduced bleeding. The prolonged rehabilitation, risk of serious wound complications and ugly scarring produced by the tradition surgery is suboptimal in many ways. We occasionally see horses with back pain that have had this surgery; unfortunately there is little that can be done. This is an example of one such case that underwent the surgery in an English equine hospital a year earlier: note the area of impingement causing ongoing pain. This type of surgery is very obvious from the outside and modified saddles are often needed to compensate.

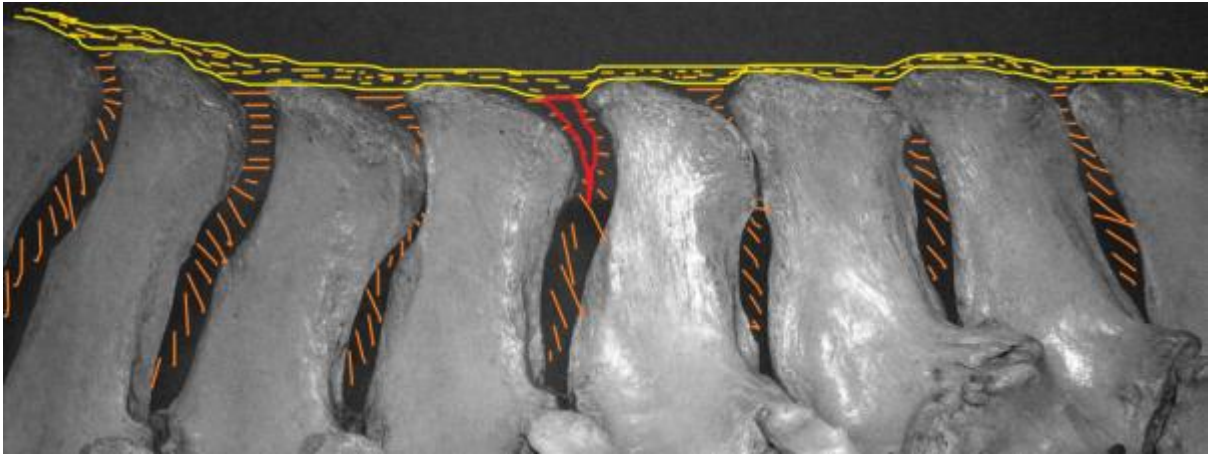


Retirement is a third treatment option. The majority (but not all) of kissing spines horses are not painful if left in a field and not ridden.

What is the special surgical treatment you do?

We developed a minimally invasive surgical treatment called interspinous ligament desmotomy (ISLD), which is carried out through a 1 cm keyhole incision. The anatomy is as follows: the interspinous ligament (ISL) is the soft tissue structure which links adjacent spines on midline (orange dashes), the supraspinous ligament (SSLP runs along the top of the spines and gives spinal stability (yellow dashed structure).

The pain from kissing spines seems to come from nerve endings present where the ISL sticks on to the bone, as well as the local muscle spasm triggered to try and prevent movement in the area. By releasing or decompressing what remains of the dysfunctional ligament during ISLD, pain is removed and back function appears to be restored. The dramatic enlargement of the back muscles that often occurs postoperatively supports this supposition.



We developed this technique in 2009 and began to apply it to the standing horse. The initial results in severely affected horses were so good that it rapidly became the first choice treatment of referring vets, owners and racehorse trainers alike. Traditional surgery is never carried here because there has never been a need. Results were first put in the public domain in 2012 (ref 3). The technique has subsequently spread worldwide, becoming the 'go to' technique for many surgeons treating kissing spines in all corners of the world.

The principle advantages are:

- Quick rehabilitation - 6 weeks* total including an hour of hand walking per day from day 1.
- Reduced cost
- Lack of complications
- Equivalent success rates to traditional surgery - this is many people's first choice even above medical treatment.

*Note that rehabilitation of a very weakened case with reduced topline and very long standing pain can take a lot longer than 6 weeks because it takes time to build muscle and strength and re-adapt to using the back normally.

Is ISLD a neurectomy?

Releasing the abnormal interspinous ligament in the area of impingement seems often causes a dramatic 'overnight' resolution of back pain, which has led some surgeons to call this technique a neurectomy. However, there is no evidence that any nerves are cut. There is no loss of sensation afterwards and there are no nerves in the anatomical area cut. Therefore it cannot be a neurectomy.

I prefer to think of the analogy of someone pulling your hair: it hurts. But if you cut the hairs between the skin and the person pulling them, they are released and the pain stops. Releasing the diseased interspinous ligament in the area of impingement stops the pain from tension on the nerve endings in the area, allowing the muscles to relax and the spaces to open up.

What are the success rates?

The first case was carried out April 2009 and all horses were followed by calling the owner and / or vet. In the 2012 review of 37 cases (ref 3), which were compared to 38 undergoing medical treatment, 95 % responded and returned to normal use. They were 24 times more likely to

experience a successful long-term result compared to the medical horses. The most recent review was published at the European College of Veterinary Surgeons annual meeting in Copenhagen, July 2014, reviewed 142 horses with 794 kissing spines over a 5-year period. Of these, 88 % returned to normal use for a period, and 83 % remained in normal use at the time of review an average of 1 year following treatment. Ironically, lameness was the major reason for horses becoming 'failures', not back pain. Only 6 of 127 horses (5 %) with long-term follow up got signs of back pain again, 4 of which were also lame.

What are the complications?

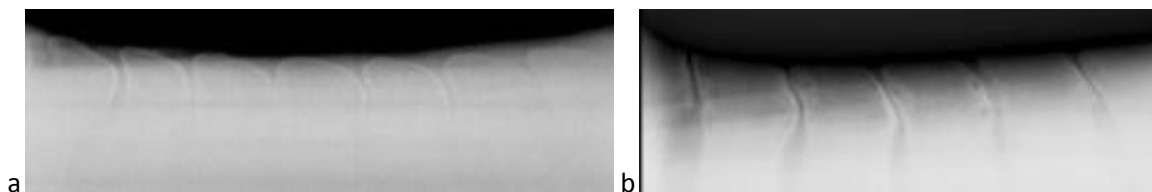
Lameness is the biggest complication of treating any horse for kissing spines, regardless of technique. In ISLD horses it affected 65 % of horses at the time of treatment or following it (ref 4). Back pain and lameness go hand in hand through the kinetic chain model discussed earlier, so it is actually rare to get a horse with pure back pain and no other lameness niggles.

Other than lameness, no horses to date develop wound-healing problems. Small non-painful bumps often form at the surgery site that disappear once riding starts. One horse developed white hairs at every wound site, but no others did.

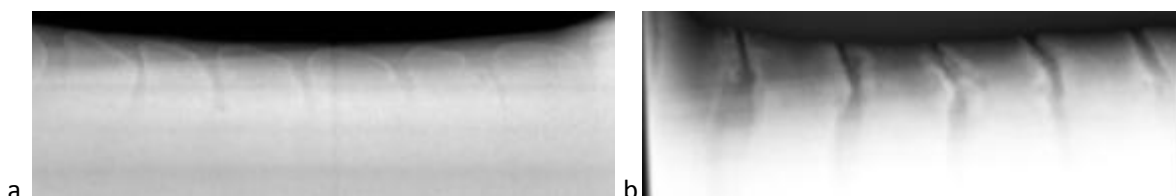
Does it work long-term?

So far no horse needed a second operation. In theory, if the underlying causes of back pain and dipping aren't addressed, and core stability falls again, the process could start all over again. Comparison of pre- and post-operative X-rays have confirmed a significant increase in the size of the interspinous space after surgery. This can be dramatic, but clinical success is not correlated with whether or not the spaces get much bigger. Sometimes all spaces return to normal, more often some spaces get a lot bigger and some less obviously bigger.

1. 2 separate cases before surgery



2. Same cases at their 6 week post-op examination, at which time both had completely resolved all signs of back pain.



Not all cases look as good as this, but virtually all operated spaces we have x-rayed get bigger. Many owners report an overnight improvement in the temperament of the horse. This suggests that low grade chronic back pain has a significant effect on the temperament and demeanour of the horse, making them grumpy in the stable.

Can you guarantee success?

No-one can guarantee any surgery. As long as the whole rehabilitation plan is followed, likely success rates should be interpreted as above. Chances are we can resolve back pain, but there is a small chance that lameness problems may develop at some stage after surgery. Worse case scenario appears to be that the horse is no better, but this is the least likely scenario. Ongoing success depends on continuing core stability by working with the Pessoa etc, maintaining good foot balance and hoof care. It requires a permanent management change, rather than a one-off treatment. If you want do a treatment then forget the back after the 6 weeks are up, then better try something else.

There is no reason why the traditional surgery cannot be carried out on a horse that had undergone ISLD, but this isn't possible the other way round for obvious reasons.

Is this surgery available anywhere else?

Yes, in many progressive veterinary clinics and hospitals around the world. The technique of ISLD is conceptually simple but technically difficult, with a learning curve of at least 20 - 30 horses in our experience. Vets have got to learn, but excellent experienced surgeons will not automatically find this technique easy or routine to start with. There is considerable scope for bone trauma that can be serious. This trauma reduces with experience, but this factor should be thought about when considering the treatment.

The other factor to consider is that success relies on following the whole 'recipe', not just taking an x-ray, snipping the ISL and job done. This means proactive rehabilitation. It also means treating the kissing spines as a component in a whole horse chronic pain/kinetic chain syndrome, and expecting to need to treat several related issues during the rehabilitation process. Anticipating and addressing the lameness complication is part of this.

How can I get my horse operated if I wanted it?

Horses are operated at Cotts Equine Hospital by Richard Coomer. If they are travelling 3 hours or less they can have the procedure done on an outpatient basis on the same day, as long as they are delivered in the morning and collected late afternoon. From further away we recommend arriving the day before surgery and going home the day after. Richard has also travelled elsewhere and abroad to perform this surgery and is happy to discuss this if you are interested.

We usually re-examine the horse at 6 weeks prior to starting riding again along with the physiotherapist. We also recommend getting the saddle checked by a master saddler at this time before riding. If you are travelling from a distance, your own vet can carry out this re-assessment.

Do you recommend physiotherapy?

Chartered (ACPAT) physiotherapists are professionals who are experts on rehabilitation, so employing one will maximise the benefit you get from surgery. A list of their members is available at www.acpat.org. They will communicate with your vet and can help reduce secondary muscular spasm, which is common along the withers and on the gluteal muscles, i.e. in front and behind the area of kissing spines, and speed up rehabilitation. The longer the problem has been going on, the more benefit horses appear to experience from physiotherapy. They are also ideally placed to tweak

the rehabilitation exercises, help decide when a horse is strong and ready to ride again, as well as advising if they think complications have arisen needing further veterinary treatment.

If you travel from further afield, we can liaise with local ACPAT registered chartered physiotherapists in your area to provide ongoing help.

What does it cost?

Please email for the attention of Richard Coomer (enquiries@cottsequine.co.uk). We ask you to speak to your vet to expedite seeking a second opinion, if this is desired. There is a fee to review x-rays, scans etc. and provide advice on a specific case from the UK, which would require us to register you first. We can also send you an estimate of costs after doing this. Please note that if you are contacting us from overseas we are always happy to hear from you, but time and logistics may mean there is a modest delay in replying.

References

1. Jeffcott LB: Disorders of the thoraco-lumbar spine of the horse: A survey of 443 cases. *Equine Vet J* 12:197, 1980.
2. Walmsley JP, Pettersson H, Winberg F, et al: Impingement of the dorsal spinous processes in two hundred and fifteen horses: case selection, surgical technique and results. *Equine Vet J* 34:23 – 28, 2002.
3. RPC Coomer, SA McKane, N Smith and JM Vandeweerd: A Controlled Study Evaluating a Novel Surgical Treatment for Kissing Spines in Standing Sedated Horses. *Vet. Surg.* 41, 890 – 897, 2012.
4. R Coomer: Desmotomy of the interspinous ligament in standing sedated horses to treat kissing spines: 142 horses. *Proceedings of ECVS annual meeting, Copenhagen*, 34 – 36, 2014.
5. J Macintyre and E Joy: Foot and ankle injuries in dance. *Clinical Sports Medicine* 19, 351 – 368, 2000