



THE SPECIALIST CONNECTION

Radiographic positioning for the cruciate patient

By Brent Higgins and Libby Leader

At VetSpecs we recommend consideration of orthogonal radiography (two views) of the lumbosacral spine, hips and stifles.

A lateral radiograph of the lumbosacral joint may increase the index of suspicion for degenerative lumbosacral stenosis, a common cause of mobility dysfunction in the canine. MRI is required for diagnosis.

A ventrodorsal view of the pelvis with the hips extended such that the femurs are parallel can be used to assess the lumbosacrum and look for the presence of hip dysplasia. It is common for hip dysplasia to present concurrently in the cruciate deficient patient.

High quality radiographs of the stifles allows for accurate diagnosis and surgical planning. The most common radiographic abnormalities found in the cruciate deficient stifle is an effusion, popliteal sesamoid displacement and generalised osteophytosis. In many dogs with early stage cruciate disease that have not progressed to full rupture a joint effusion may be the only radiographic abnormality. Perform bilateral non-obliques mediolateral and caudo-cranial radiographs centered on the stifle but including the hock. To do this aim to have the femoral condyles superimposed on the mediolateral radiograph with the stifle extended to 135 degrees.

The use of positioning aids such as sand bags, ties and foam wedges are great tools to protect staff from unnecessary radiographic exposure. All patients will need a different approach to positioning, but the most common aids we use to get the perfect superimposed femoral condyler views are:



Left: A mediolateral stifle radiograph, note the hock is included but the beam has been centered on the stifle. Also note the stifle effusion. Centre: This photo shows one method of achieving a caudal-cranial radiograph of the stifle. Note the sand bags against the patient's pelvis. Right: A caudocranial stifle radiograph, note the hock is included but the beam has been centered on the stifle.

- A foam wedge under the pelvis to position the femoral shaft parallel with the table
- Half hitch ties to move the opposite limb or tail from the radiographic beam
- Sand bags to keep the patient in place
- A foam wedge under a deep chested patients ribcage to align the body parallel with the table
- Extra foam wedges to move the os penis from view, under the hock to straighten the limb or cranial to the femur to extend the stifle.



A sedated patient with positioning aids.



Foam wedge used under the hock.

TPLO, TTA, TWO, TTO ... Which acronym is best?

By Damian Chase BVSC MANZCVS DipECVS

Cranial cruciate ligament (CCL) disease is one of the most common causes of lameness in dogs and a variety of surgical treatment methods have been described. But which is best?

Unfortunately that question is not possible to answer as there have been very few objective studies comparing the outcomes of the various surgeries.

It has been hypothesised that excessive cranial tibial thrust may be an important factor in the pathogenesis of CCL failure. One factor that controls tibial thrust is the tibial plateau angle. Increasing tibial plateau angle (TPA) has been shown to increase the magnitude of cranial tibial thrust (CTT) in cadaver stifle models.

It has been suggested that dogs with CCL failure have a significantly greater TPA than dogs without CCL failure. However several studies have found no correlation between magnitude of TPA and CCL failure. Regardless, reducing the TPA is the basis for treatment by numerous proximal tibial osteotomies including; cranial Tibial closing Wedge Osteotomy (TWO), Slocum crescentic Tibial Plateau Levelling Osteotomy (TPLO) and Triple Tibial Osteotomy (TTO). Tibial Tuberosity Advancement (TTA) uses a different method to neutralise cranial tibial thrust but the end result is similar. All of the above mentioned tibial osteotomies alter the geometry of the proximal aspect of the tibia and stabilise the CCL deficient stifle joint by neutralising cranial tibial thrust.

TTA as proposed initially by Montavon and Tepic is based on a mechanical model analysis of the human knee by Nisell, who assessed cranial tibial thrust throughout knee flexion angle and described a "crossover point" at which the cranial tibial thrust was neutral. This crossover point was dependent on the patella ligament angle with respect to the TPA. This neutral crossover point has been shown in the dog to be 90 degrees. The effect of TTA to neutralise cranial tibial thrust has been validated in multiple cadaveric studies.



Measurement of TPA and Slocum TPLO to reduce TPA



Patella Ligament angle and TTA

Retrospective analysis of TPLOs has shown that levelling of the tibial plateau has the same effect of reducing the patella ligament angle to 90 degrees. Therefore the two surgeries are achieving the same effect.

TPLO moves the tibial plateau so that it is 90 degrees to the weight bearing axis
TTA moves the weight bearing axis so that it is 90 degrees to the tibial plateau

Various studies have been published comparing the different surgical options. Most studies have not found significant differences between them. However the majority of orthopaedic surgeons would prefer to perform an osteotomy technique rather than a suture stabilisation technique in larger dogs because it appears to provide a better outcome, especially in the short term.

The table below summarises the surgical outcomes from a variety of different studies. As you can see the outcomes are broadly similar. The reason for choosing one surgery over another comes mainly down to surgeon's preference. Major complications are defined as those that require additional surgery.

Therefore the objective of TTA is to move the tibial tuberosity cranially so that the patella ligament is 90 degrees to the tibial plateau when the stifle is at an assumed weight bearing angle of 135 degrees. At this weight bearing angle the patella ligament is parallel to the weight bearing axis through the stifle. Therefore when the patella ligament angle is 90 degrees, the weight bearing force through the stifle is perpendicular to the tibial plateau.

History of proximal tibial osteotomies

- 1983 Slocum proposes cranial tibial thrust as a primary force in the stifle.
- 1984 Description and case series of tibial closing wedge osteotomy.
- 1993 Crescentic TPLO first described by Slocum and Slocum.
- 1999 25% of US surgeons using TPLO as primary treatment option.
- 2001 Morris demonstrates increased TPA in dogs affected by CCL deficiency.
- 2002 Tibial tuberosity Advancement proposed by Montavon and Tepic.
- 2005 Conzemius publishes objective comparison of CCL repair techniques.
- 2006 Robinson demonstrates final TPA unimportant.

Procedure	Overall Complication Rate	Major Complication rate	Outcome Good to Excellent
TPLO	15-40% (33%)	6.6-17.4% (12.6%)	83-95%
TTA	21-59% (32.6%)	12.3%	85-95%
TWO	22.7%	20%	85%
TTO	36%	23%	100%
LRS	17.4%	7.2%	80-95%



At Vetspecs we have utilised all of the osteotomy techniques and at present we are most commonly performing TTA. Specifically we are using the OssAbility implant system which utilises a state of the art titanium wedge.

We have a number of reasons for the choice of this surgery.

- TTA may correct the tibio-femoral shear force closer to the neutral point compared with TPLO.
- TTA provides unchanged joint geometry and superior cartilage

pressure distribution compared with TPLO.

- TTA may also be a less invasive, simpler and quicker surgical procedure with less soft tissue dissection.
- TTA is less likely to change limb angulation and therefore may have fewer potential technical issues and associated adverse effects.
- OssAbility titanium wedge is very biocompatible and enhances bone ingrowth.
- OssAbility titanium wedge supports the tibial tuberosity down its entire

length and therefore reduces stress.

- Both TTA and TPLO can correct other deformities such as patella luxation, but TTA may be better suited for this.
- TPLO is still a very good surgery and may be more suitable for dogs with abnormally high TPA's.

At Vetspecs we continually strive to find methods to give the best possible mobility and quality of life to our patients. The search for the perfect cruciate stabilisation surgery is ongoing, but we will never stop looking.

A New Zealand First: The Christchurch TTA Wet-Lab Workshop

On the 8th February 2015 Christchurch hosted New Zealand's first TTA course. Presented by VetSpecs specialist surgeons, this wet-lab workshop demonstrated New Zealand's very own TTA technique - the Oss|Ability TTA Wedge System.

More practices are now wanting to offer higher standards of care. Currently there is an increasing demand for procedures that allow for a more rapid return of function. As technology develops and makes it easier for clinicians to utilise advanced technologies for their patients, VetSpecs chooses to support that ethos and engage with the local veterinary community through education. The result is better care for New Zealand pets.

The Oss|Ability Tibial Tuberosity Advancement (TTA) Wedge System is the latest generation in surgical technology for the treatment of lameness associated

with canine cranial cruciate ligament disease. It incorporates the best features of all global TTA techniques and fuses advanced osseointegrative 3D-printed titanium scaffold implant technology, borrowed from the human world, with clever instrumentation designed to simplify the procedure and minimise the subjectivity of intra-operative decision making. This gives the surgeon an objective and repeatable system they can apply with confidence. First used at VetSpecs in 2014 it is now being used at a variety of South Island clinics.

The day started with Dr. Brent Higgins introducing his vision for New Zealand becoming an epicentre of veterinary technology design, bringing us up to the creative level of our cousins in the human medical industry, exporting new medical technologies to the world. Dr. Damian Chase overviewed the variety

of treatments now available for CCL techniques and discussed the reasons for his preference of TTA. Dr Helen Milner briefed the group on the critical importance of aseptic technique when using implants and Seamus Tredinnick, CEO of Oss|Ability, presented the new and innovative technology that gives surgeons the ability to predict and control the operative outcome.

In the afternoon delegates were given the opportunity to practice their new found knowledge in a wet-lab setting. It was an incredible day of education, technology and surgery. VetSpecs hopes that an increasing number of animals will benefit from the technology. Many thanks to Dr Helen Milner and VetSpecs for hosting such a great course.

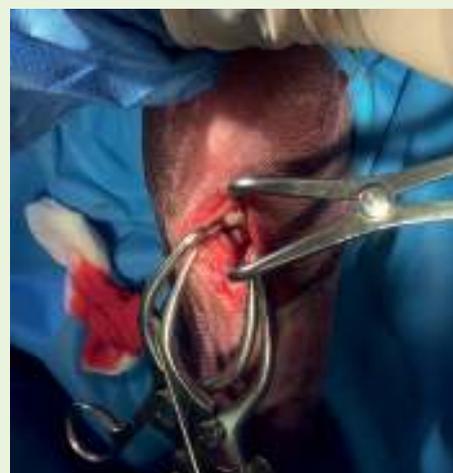
For more information on future courses contact info@ossability.com

The mini-medial stifle arthrotomy

To assess the cranial cruciate ligaments and the menisci the mini-medial stifle arthrotomy is a technique preferred by many surgeons. It delivers the same viewing ability as a large arthrotomy whilst decreasing tissue trauma due to its less invasive approach. The procedure involves creating a 10-15mm medial parapatellar arthrotomy distal to the medial patellar retinaculum.

Two Gelpi self retaining retractors and a stifle distractor are required. See the video at drbrenthiggins.com (*patient treatment techniques*).

Shows the positioning for a mediolateral stifle radiograph. The affected stifle is extended to 135 degrees, the contralateral limb is drawn cranially, and there is a foam pad underneath the patient's hips and chest.

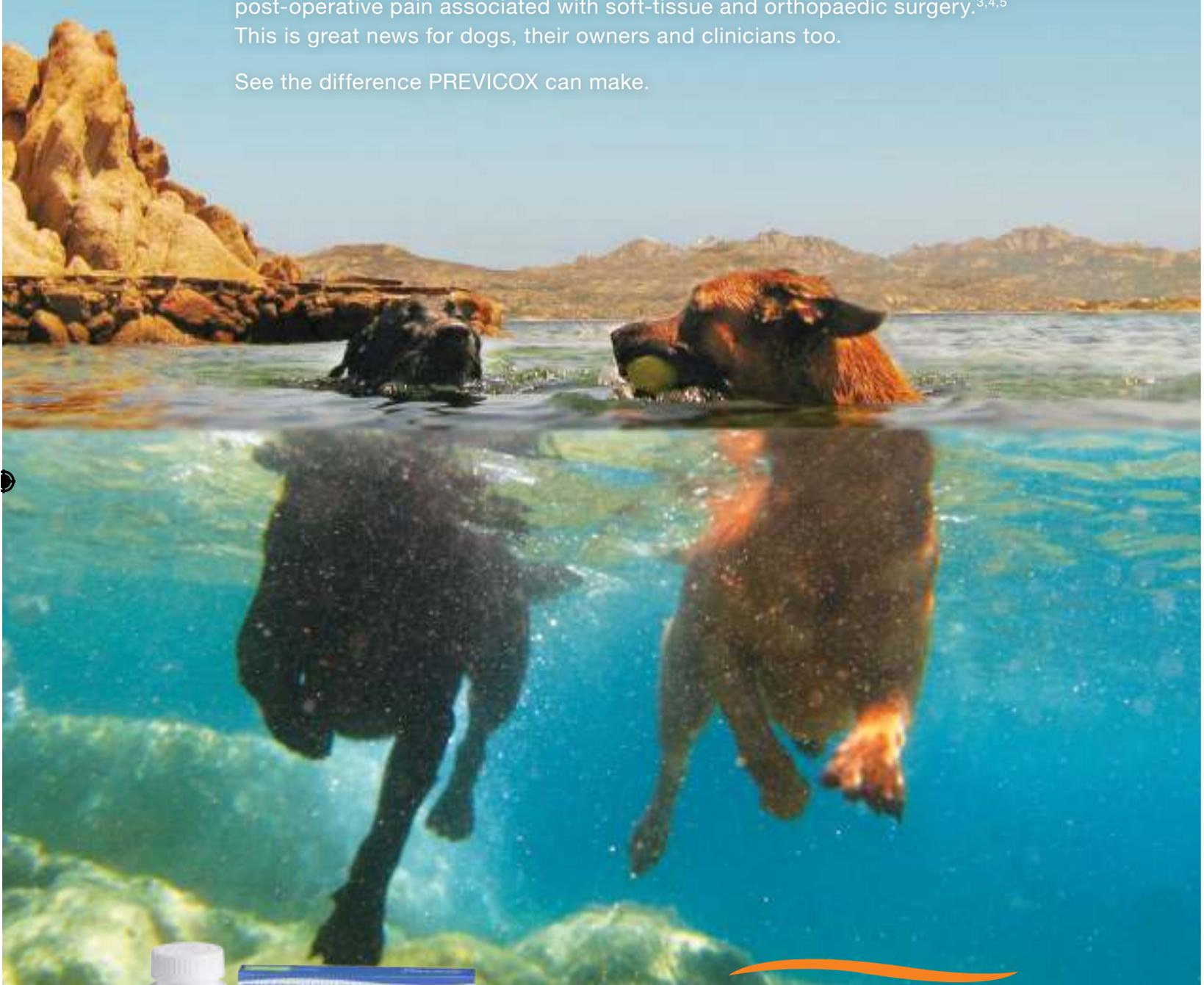


Thanks to PREVICOX[®], Max is dating again.

The pain and inflammation associated with canine osteoarthritis or surgery can severely impact a dog's quality of life.

PREVICOX, proven to manage the pain and inflammation associated with canine osteoarthritis^{1,2} is now also approved for the effective control of post-operative pain associated with soft-tissue and orthopaedic surgery.^{3,4,5} This is great news for dogs, their owners and clinicians too.

See the difference PREVICOX can make.



NEW INDICATION

Control of post-operative pain following orthopaedic surgery.

References: 1. Ryan W, Moldave K, Carithers D. Clinical Effectiveness and Safety of a New NSAID, Firocoxib: A 1,000 Dog Study. *Veterinary Therapeutics*, Vol 7, 119–126, 2006. 2. Pollmeier M, et al. Clinical evaluation of firocoxib and carprofen for the treatment of dogs with osteoarthritis. *Veterinary Record*; 159: 547–551, 2006. 3. Freedom of Information Summary, Supplemental new drug application, NADA 141-230, PREVICOX. 4. Merial Data on File PR&D 0102001-11 and 13. 5. Lever, et al. Management of peri-operative pain associated with soft tissue surgery in dogs treated with Firocoxib. *Proc ACVIM June 9–12 2004*; Abstract 134.

Previcox[®]
firocoxib



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Designed for Dogs

PREVICOX is a highly selective COX-2 inhibitor indicated for the relief of pain and inflammation associated with osteoarthritis and for the control of post-operative pain associated with surgery.



- Rapidly absorbed, fast-acting
- Convenient once-a-day dosing
- Controls pain and inflammation for a full 24 hours
- With or without food; Highly palatable
- Proven safety profile

Rapid Absorption

PREVICOX is rapidly absorbed after oral administration:

- Detected in plasma within 30 minutes¹
- Peak plasma levels reached within 90 minutes¹

Approved for orthopaedic surgical pain²

- In a multi-centre field study, 226 client-owned dogs ranging in age from 0.7 – 17 years, were enrolled for surgical repair of a rupture of the cranial cruciate ligament
- Dogs were treated with PREVICOX or sham-dosed; all dogs were evaluated for pain following orthopaedic surgery using the Glasgow Composite Pain Scale (GCPS).
- At each time point following orthopaedic surgery, dogs treated with PREVICOX had significantly lower pain scores than dogs in the control group. (see Chart 1 below).

Proven Safety Profile

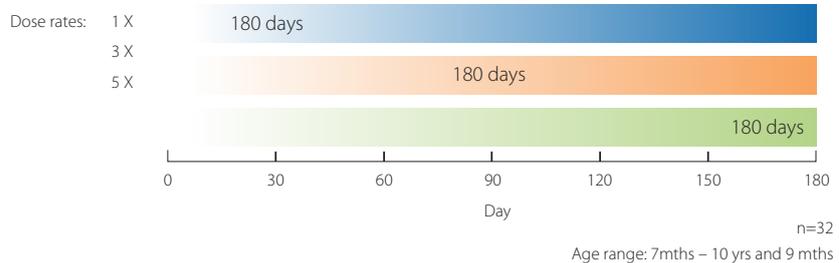
- No increase in bleeding times or clotting profiles^{3,4}
- No stomach ulceration at dosages up to 5 times the recommended dosage⁴
- Safety profile demonstrated in long term clinical trials⁴. (See Study 1 below).
- Even at 3x and 5x the therapeutic dose, there were no clinically significant events throughout the 180 day treatment period



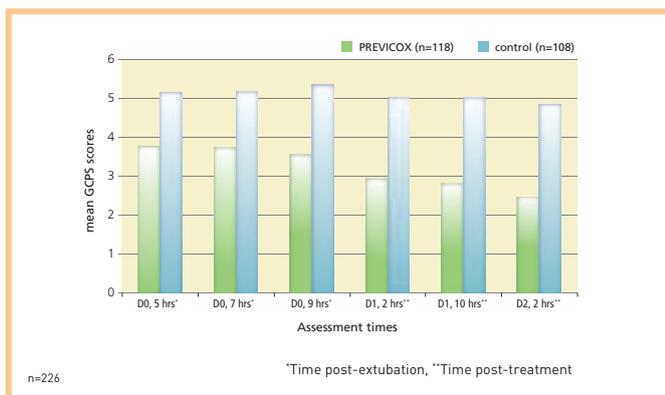
Same easy dose rate (5mg/kg) for osteoarthritis and soft-tissue, orthopaedic or dental surgery

PREVICOX: Dosing table to deliver a minimum dose of 5 mg/kg		
Body weight (kg)	Number of tablets per day	
		57 mg
3 – 6	½	
3 to 11	1	
11 to 17	1 ½	
17 to 22		½
22 to 45		1
45 to 68		1 ½
68 to 90		2

Study 1: In a clinical trial using dose rates of up to 5x the recommended dose rate over 180 days, the safety profile of PREVICOX over a range of dog ages and weights was demonstrated.



Mean GCPS Scores by treatment group at each assessment time point



- 1 Data on file at Merial, PR&D 84101
- 2 Data on file at Merial, PR&D 102001 -11 and 13
- 3 Data on file at Merial, PR&D 54101, PR&D 78601, PR&D 53301
- 4 Data on file at Merial, PR&D 78601

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Veterinary Tissue Bank Allograft products now available from Vetspecs

Vet Specs and Pet Doctors: a new partnership

Vet Specs is pleased to announce that we recently joined the ownership group that also owns Pet Doctors. With its nationwide network, the Pet Doctors Group will provide management expertise and support for Vet Specs. Vet Specs will continue to operate as a 100% independent expert referral service, committed to unbiased independent advice and surgery. Our established team of Specialists will now be able to focus

more completely on providing cutting edge surgical care for clients and patients.

Pet Doctors was founded in 2005 by two experienced Kiwi veterinarians, Dr Steve Merchant and Dr Seton Butler. Their vision to develop a nationwide veterinary company of qualified, capable staff who share their driving passion for the well-being of New Zealand's pets has resulted in a network of 25 clinics and a



veterinary experience optimized through team based care, pet-parent centricity, but perhaps most importantly, through absolute, categorical, pet advocacy. This aligns well with Vet Specs' own ethos; of true compassion for pets from a supportive team that really cares.

j/d™ Joint diet

Arthritis in dogs and cats tends to be slowly progressive and can occur in any animal however excess weight can increase the risk of developing arthritis. After having undergone any corrective orthopaedic surgery or having your pet diagnosed with arthritis, Vetspecs recommend switching your pet to Hill's Prescription Diet™ j/d™, as early intervention is important in reducing the progression of this disease.

Arthritic changes occur when cartilage is worn away faster than it can regenerate. When it wears away the joints become swollen and painful.

Pets at a healthy weight and over one year of age can be on j/d™ long term.

This is a diet with a clinically proven combination of nutrients high in omega -3 fatty acids (EPA and DHA), controlled calorie content and L-carnitine.

- The high levels of omega 3's interrupt

the destruction of cartilage and reduce inflammation

- The Omega 3- omega 6 ratio helps reduce the intermediate compounds that cause inflammation
- Added glucosamine and chondroitin provide the building blocks for cartilage repair
- The superior antioxidant formula helps neutralise harmful free radicals in the joints
- Useful as a nutritional aid for pre and post orthopaedic care

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- + Family run for over 25 years
- + Excellent, friendly, knowledgeable & hassle-free service
- + Proud supporters of the Vetspecs Surgical Resident

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Hill's Prescription Diet™ j/d™ is clinically proven to help improve a dogs ability to walk, run and jump in as little as 21 days



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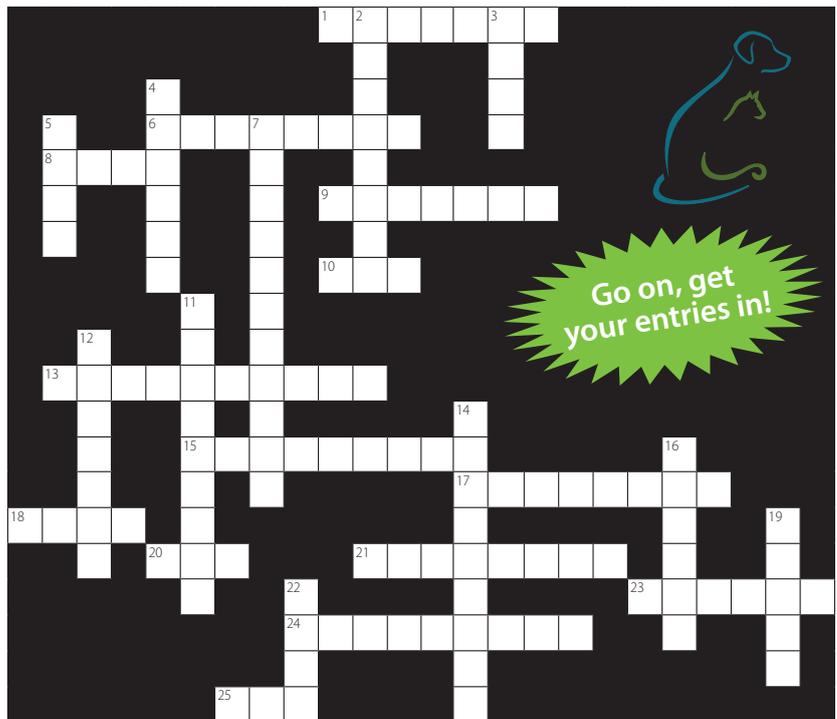
Crossword

ACROSS

1. Patient pain evaluation can be measured on the ___ composite pain scale. (7)
6. ___ Anaesthesia is great pain management technique. (8)
8. EPA stands for Eicosapentaenoic ___. (4)
9. Surgical procedures such as the TTA and TPLO aim to change the weight ___ axis. (7)
10. What is the current surgical technique Vetspecs is using on dogs with cruciate disease? (3)
13. Dogs given 5x the recommended dose of Previcox showed no signs of stomach ___. (10)
15. The Neutral ___ Point, has been shown in the dog to be 90 Degrees. (9)
17. Oss|Ability uses a state of the art ___ Wedge. (8)
18. A ___ Wedge is useful in radiographic positioning. (4)
20. ___ Dysplasia is common in patients with cruciate disease. (3)
21. What month was the Oss|Ability wetshop held? (8)
23. The speakers for the TTA workshop were: Brent, Damian, Helen and ___. (6)
24. The O in TPLO and TTO stands for ____. (9)
25. Pets over ___ year of age can be on j/d. (3)

DOWN

2. One of the most common causes of lameness in dogs is cranial cruciate ___ disease. (8)
3. Previcox is a ___ a day tablet. (4)
4. The Mini ___ stifle arthrotomy is a technique used to assess the cruciate ligament and menisci. (6)
5. Pet Doctors take a team based approach to ___. (4)
7. The high levels of Omega 3's found in j/d, interrupt the ___ of cartilage. (11)



11. What is the main ingredient in previcox? (9)
12. TPA stands for Tibial ___ Angle. (7)
14. The most common disease to occur after any surgery involving the joint is ____. (9)
16. Pet Doctors was founded by Steve Merchant and Seton ___. (6)
19. Pet Doctors want to help all pets "Live ___ to an old age". (5)
22. The Oss|Ability wedge enhances ___ ingrowth. (4)

Fax, email or post your completed crossword to Vetspecs by Friday 8th of May 2015. All correct entries go into the draw to win a \$100 hamper, kindly supplied by SVS. Remember to include your name, clinic name and contact number so you can be notified. Winner will be drawn on Friday the 15th May 2015 and put on our facebook page.



Vetspecs team

Left to right: Helen Milner (Director), Brent Higgins, Aparna Tikekar, Damian Chase, Kristina Boyd, Melissa Roberts, Lauren Keenan, Libby Leader and Philipa Burns.



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