Issue 10. April 2008

The Next Step

Veterinary **Specialist** Group

EXPERTISE • TECHNOLOGY • COMPASSION

Staff Focus- Shannon Reed

Shannon is part of the medicine nursing team.

How long have you worked at VSG?
Three and a half years.

What do you enjoy about working at VSG?
Being part of a team of committed enthusiastic people who really care.

What do you enjoy doing on the weekends?
Chilling out on West Coast beaches, getting out of Auckland.

Tell me about your family.
They are scattered globally!

What inspired you to become a veterinary nurse?
The trite, but true... love of animals.

How many animals do you have at home?
One rent-a-cat.

What is your favourite meal?
Vietnamese spring rolls.

And your favourite TV programme?
I don't own a television.

What is your favourite holiday destination?
I'm still searching.

If you won Lotto tomorrow, what would you spend the money on?
Pay off my mom's mortgage, donate to charities, then continue hunting for that favourite vacation spot.

VSG Administration Team on The Move

Into our 8th year of operation, VSG staff numbers have tripled in size, as have the patient numbers.

The administration team has moved out of the hospital to make way for the increased veterinary staff & patients. A cottage next to VSG, with road frontage on the Unitec campus now houses the administration staff, and also contains the staff canteen.

The cottage will be the venue for the VSG Seminar Series.

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The Veterinary Specialist Group hospital is located on the Unitec campus situated between Gates 2 and 3 on Carrington Road.

From Intern to Radiologist - by Chris Warman

In September of 2007, Dr. James Sutherland-Smith, the first VSG-Pfizer intern, passed his board examinations and was admitted as a Diplomate of the American College of Veterinary Radiology. James has authored or co-authored several papers in diagnostic imaging during his residency. He has also contributed a chapter to Drs. Dominique Pennick and Marc Andre D'Aujou's new text-book "Atlas of Small Animal Ultrasonography". James has obtained a clinical position at Tufts University for the next 3 years, but has not ruled out the possibility of returning to New Zealand in the future. James was instrumental, along with staff from Pfizer and VSG, in the initiation of the VSG-Pfizer internship program.

It is pleasing for those involved in the VSG-Pfizer program to see the success of the past interns and the growing recognition this internship is achieving with overseas institutions. Dr Wendy Archipow is completing a surgical residency at Purdue, Dr Thurid Freitag a medicine residency in Dublin, Dr Ben Wernham an internship in Kansas and Dr Kyle Clark is about to commence an internship at Atlantic Veterinary College at the University of Prince Edward Island in Canada. The VSG-Pfizer internship is proving to be a valuable springboard for a new graduate considering a career as a veterinary specialist. Realistically not all these interns will return to our shores, but those who do will boost the specialist resources available to the New Zealand veterinary profession. Those interns who choose to remain overseas will hopefully increase the networking opportunities within those veterinary communities for New Zealand veterinarians.

It is for the New Zealand veterinary community to encourage continuing professional development of new graduates and undergraduates early in their careers. If possible members should offer any tangible support to a young veterinarian who expresses an interest in a postgraduate training position.

An increase in the number of specialists in this country will provide a greater reference resource for the profession. An increase in the number and availability of specialists will also likely be appreciated by the general community as a sign of a progressive and enlightened profession.

The Pfizer Internship at Veterinary Specialist Group

Pfizer Animal Health

VSG in conjunction with Pfizer New Zealand are pleased to welcome Dr. Debbie Simpson as the 2008 Pfizer Intern @ VSG. Debbie has completed her veterinary degree at Massey University in 2007. Following the completion of her twelve-month internship, she hopes to pursue further clinical specialist training through the North American residency program system.

The Pfizer Internship is offered to new graduates of Massey University annually and is a fixed twelve-month position from December to December of the following year. The position offers concentrated, supervised, in-hospital training through services in small animal surgery, internal medicine and diagnostic imaging. Pfizer New Zealand has been a key contributor to the success of the programme.

The objectives of the programme are:

1. To prepare the intern for postgraduate specialist training (internship, residency, research) at university teaching hospitals overseas.
2. To provide the intern with an opportunity to develop an understanding of the clinical management of challenging small animal medicine and surgery cases.
3. To allow the intern to learn professional publication and presentation skills.
4. To provide the intern an opportunity to develop skills in client communication, medical record keeping, and literature review.

The intern has no primary case responsibility but works alongside the specialist during the admission of complex cases referred to the Veterinary Specialist Group hospital. During the year, the intern will develop the clinical skills required to assess, diagnose, and treat these patients with the opportunity to refine fundamental skills including catheter placement, blood collection, fluid therapy, anaesthesia management, analgesia, transfusion medicine, and the acquiring and interpretation of imaging studies and clinical pathology. If an animal proceeds to surgery, the intern is scrubbed in as surgical assistant, getting first-hand experience of general surgical principles and specific techniques. The monitoring, management and care of hospitalised patients are a major part of the intern's duties that extend to weekends and after hours.

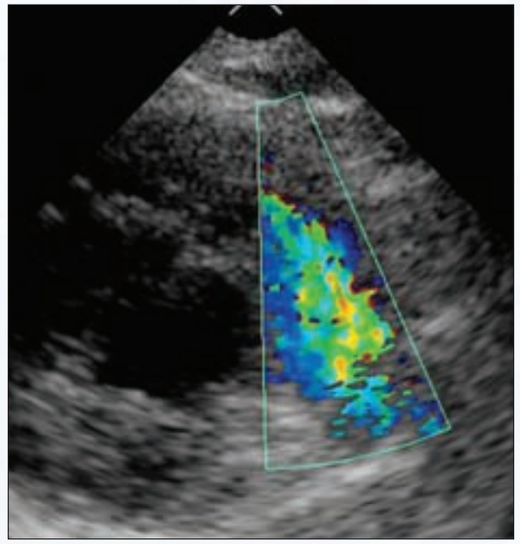
Dynamic Right Ventricular Outflow Obstruction in the Cat - by Darren Fry

The recognition of a heart murmur in an adult can be a very significant event in the life of that cat. The murmur may indicate a wide variety of disease processes ranging from benign and incidental, through to life-threatening. Once potential systemic causes have been investigated such as pyrexia, anaemia, systemic hypertension and hyperthyroidism, then by far the most useful tool to investigate and characterise the murmur is echocardiography. 2D imaging is useful to suggest a possible cause of the turbulent flow. For example, if left ventricular hypertrophy is particularly prominent in the region of the left ventricular outflow tract, then this may indicate that an outflow obstruction is the cause of the murmur. Similarly, M-mode imaging of the mitral valve can sometimes demonstrate systolic anterior motion (SAM) of the valve which may be associated with both mitral regurgitation and outflow turbulence. However, to definitively characterise the murmur, Doppler studies are required. Colour flow Doppler is used to identify the area of turbulent flow and then continuous wave measurements can be made to measure the velocity of that flow. In cats with cardiomyopathy, as already mentioned, common areas of turbulent flow would include the left ventricular outflow tract and regurgitation across the mitral valve. In some adult cats with heart murmurs though, a source of the murmur has historically been difficult or impossible to identify.

However, a paper published by Rishniw and Thomas (JVIM, Sep-Oct 2002, 16: 547-52) described a phenomenon of dynamic right ventricular outflow obstruction (DRVO) which may help to explain many of these "mystery" murmurs. In this study, 51 cats presented for non-cardiac disease but with a murmur were evaluated retrospectively. DRVO was identified in the right parasternal short axis view from just cranial to the tricuspid valve and involving the infundibular region of the right ventricle. No right ventricular hypertrophy was seen and pulmonary artery velocities were normal. All cats had sternal murmurs, often louder on the right side. Dynamic murmurs (i.e. changing in intensity or disappearing at lower heart rates) were common. 73% of the cats had no other cardiac disorders but some of the younger cats had hypertrophic cardiomyopathy. Most of the cats were middle aged or older and most had other disease processes, some of which could have affected flow (e.g. anaemia and dehydration). However, the conclusion of the paper was that DRVO appears to be a benign process and is possibly a unique physiological phenomenon in the cat. To identify DRVO, high quality Doppler studies are required and also an area not normally closely interrogated in cats must be evaluated.

Since the paper was published, DRVO has been recognised commonly at VSG and this adds another dimension to the investigation of a feline heart murmur. The possibility of identifying a benign disease process in an adult cat with a heart murmur offers the potential for providing peace of mind for a worried client.

Picture 1. *It is very important to auscultate the sternal region in cats as many murmurs can only be heard in this area.*



Picture 2. *Short axis ultrasound image of the left ventricle and right ventricular outflow tract of a cat. Colour flow Doppler demonstrates the typical pattern of turbulence seen with DRVO.*

Foot and Toe Injuries - by Richard Jerram

Injuries to the feet and toes of the forelimbs in dogs and cats are not infrequent and can be frustrating to manage. Like injuries to the fingers and hands in humans, these injuries should not be taken lightly particularly in athletic or working dogs. Fractures are generally more easily treated than joint injuries.

Metacarpal/metatarsal fractures.
The metacarpal and metatarsal bones are divided into three anatomical regions consisting of the proximally oriented base, the diaphysis, and the distal aspect called the head. It has earlier been reported that the use of external coaptation as a treatment method results in a greater than 50% complication rate with residual lameness, malunion, infection, and osteoarthritis. More recently two reports provided conflicting evidence on whether open reduction and internal fixation will result in improved success and complication rates. I believe that external coaptation is indicated for treatment of minimally displaced fractures of one or two metacarpal/metatarsal bones only. However, if an owner declines surgical treatment recommendations in patients with multiple metacarpal and metatarsal fractures then external coaptation appears to be an acceptable alternative method of treatment. Regular splint or cast assessment and bandage changing are necessary to minimize bandage morbidity and potential malunion. Unfortunately, in my experience, these animals tend to have the poorest owner compliance with a higher number of complaints if complications occur.

I almost always recommend open reduction and internal fixation for metacarpal/metatarsal fractures if more than two bones are fractured especially if this includes the main weight-bearing bones (3rd and 4th). The principles of orthopedic fracture repair apply to the metatarsal and metacarpal bones just as they do to the other long bones of the anatomy. In general, fractures of the basilar aspect of the metacarpal/metatarsal bones are repaired using an intramedullary pin and tension band technique or a lag screw. Occasionally, multiple fractures in this region may need to be repaired using partial arthrodesis technique. Fractures of the diaphysis of the metacarpals or metatarsals can be repaired using intramedullary pins. To avoid damage to the metacarpophalangeal joint, the intramedullary pins (usually K-wires) can be inserted at the dorsal edge of the articular cartilage. If the pin is not too large then it can be bent during insertion and allowed to move proximally within the medullary canal. Intramedullary pins in metacarpal and metatarsal fractures do not provide fracture stability but do provide some axial alignment. Anatomical reduction and fixation using bone plates can provide excellent stability and alignment in patients, particularly those with fractures of all four metacarpal or metatarsal bones. Usually, small bone plates (2.0 mm or 1.5 mm) are necessary and as these do not provide complete bending strength to these bones, postoperative external support is essential. In some cases, a combination of bone plate fixation and intramedullary pinning can be used. Fractures of the head of the metatarsal or metacarpal bones can be difficult to repair as they are frequently intra-articular. Anatomical reconstruction and repair using small K-wires or lag screws is recommended. In my experience implant removal is necessary following fracture

1. Surgical treatment of metacarpal fractures in a dog.

healing in intra-articular fracture cases for the animal to regain normal function. In these patients the owner should be warned that degenerative joint disease in the metatarsophalangeal or metacarpophalangeal joints can be debilitating and ultimately, digit amputation is a possible sequelae.

Phalangeal fractures.
Fractures of the phalanges occur occasionally in dogs and less frequently in cats. Most cases are isolated and external coaptation is generally acceptable for satisfactory recovery. In some large breed dogs, open reduction and internal fixation can be recommended. Treatment options are similar to those for metacarpal and metatarsal fractures depending on the size of the bone fragments and degree of comminution. I find small bone plate fixation superior as this appears to be a comfortable method of fixation for the animal during the healing phase. Severely comminuted fractures of the phalanges that involve the intra-articular surfaces can be challenging and frequently digit amputation is recommended.

Sesamoid injuries.
Sesamoid bones are small multiple nodular bones located within the palmar and plantar tendons of the metacarpophalangeal and metatarsophalangeal joints respectively. Their function is to protect tendons as they pass over the bony prominences, to increase the surface area for attachment of the ligaments of the joints and to redirect the pull of tendons to improve mechanical advantage. The sesamoid bones have strong ligamentous attachment to each other into the associated metacarpal and phalangeal bones. Fragmentation of the sesamoid bones in the front feet (metacarpophalangeal joints) have been commonly reported with this condition predominate in the Rottweiler and Greyhound breeds. The second and seventh sesamoid bones are more commonly affected possibly due to the increased flexor tendon pressure on these more medially and laterally placed bones. Clinically, dogs exhibit a weight-bearing lameness of the affected forelimb and a strong pain response can be elicited on palpation and manipulation of the affected area. In addition, there may be some evidence of joint thickening and reduced joint flexion of the associated metacarpophalangeal joint. Radiographic evidence of sesamoid fractures can be determined, however, it is important to remember that some sesamoid bones can be bipartite or multipartite without this being clinically significant. The distinction between fragmentation and bipartite sesamoid bones is generally made based on the presence of a smooth, regular division of bipartite sesamoid bones compared to a sharp well-defined border of a fracture or fragmentation. Conservative treatment is generally recommended for sesamoid disease as surgical removal has been shown to result in significantly greater progression of metacarpophalangeal osteoarthritis and chronic lameness. Conservative treatment consists of rest with or without splint/bandaging and occasionally I have used intralesional long-acting corticosteroid treatment.

Similar injuries can occur to the sesamoids of the metatarsophalangeal joints, however, these appear to be extremely rare. Conservative treatment would be recommended in these cases also.

2. Preoperative radiograph of metacarpal fractures in a cat.

3. Postoperative radiograph following 1.5mm bone plate stabilization of metacarpal fractures in the same cat as figure 2.

Phalangeal ligamentous injuries.
Injury to the ligaments of the metacarpophalangeal and phalangeal joints are not common with the exception of the racing Greyhound and other working dogs. In these breeds of the dogs these injuries can be debilitating and surgical reconstruction is probably recommended. Unfortunately, some of these injuries are not seen until the lameness has become chronic and reconstruction of the torn ligaments can be challenging. Suture repair of the interphalangeal tissues is described with concurrent postoperative splint/bandage support. In chronic cases, amputation of the phalanx may be necessary.

Foot and pad wounds.
Wounds of the dorsal or palmar/plantar aspect of the feet can be extremely challenging and frustrating to manage. The pads in particular absorb considerable vertical forces during physical activity. Loss or severe injury to the pads can significantly compromise limb function. Animals presented with injury of the distal aspect of the limb need to be fully assessed to ensure that more significant life-threatening injuries such as thoracic, abdominal, or cranial trauma are not present. Initial management of the wound should consist of open-wound management with lavage and wet-to-dry bandages. Debridement of obviously devitalized tissue and removal of foreign material is also recommended. Full assessment of the severity of the wound can be performed several days following the initial injury. Delayed closure may be appropriate in some patients with lacerations of the dorsal skin surfaces, however, in most cases there is too much damage to the tissue to provide closure and, therefore, secondary intention healing with granulation tissue, wound contraction, and epithelialization is more common. Unfortunately, wound contraction can result in deformity and poor function of the foot. Wound reconstruction methods such as free skin grafting, skin flap techniques and pouch flap techniques should be considered in these cases.

Lacerations to the pad tissue generally bleed profusely and a temporary pressure bandage should be immediately applied. Assessment of the underlying flexor tendons is essential as displacement of the digits can result in abnormal weight-bearing leading to pad ulceration and continued lameness. Delayed closure using standard tendon repair suture pattern can be performed several days following the initial injury. Pad lacerations should be treated using multiple layer closure and possibly tension-relieving sutures. Postoperative support should consist of a clam shell-type splint bandage or alternatively, a large padded bandage. The splint should be maintained for a minimum of two weeks but preferably four weeks with changes once or twice weekly. Severe pad wounds resulting in loss of a large amount of pad tissue can be treated using foot pad transposition, pad grafting from the non-weight-bearing carpal pads, or a technique described as phalangeal fillet.

Neoplastic foot and toe conditions.
Tumours of the foot and toes are not particularly common but neoplastic conditions should be considered in cases with foot lesions that do not respond to initial medical treatment. All animals with a suspected neoplastic digital condition should have tumor staging by analysis of regional lymph nodes, thoracic radiography and possibly abdominal ultrasonography. Squamous cell carcinoma accounts for more than 50% of tumours reported. Other diagnoses include malignant melanoma, osteosarcoma, hemangiopericytoma, and soft tissue tumours (benign or malignant). Early surgical intervention is advised when treating dogs with digital tumours regardless of the tumor type or the presence of metastatic disease. With early diagnosis and surgical treatment, amputation of only the affected digit can often be performed. Unfortunately, cases with a more chronic history may require complete limb amputation. Removal of two adjacent digits is possible and this has been successfully reported as partial foot amputation. Dogs that have had more than one digit amputated may have some residual lameness postoperatively; however, this should not be a reason to not offer this treatment. Ancillary cancer treatment with chemotherapy should be discussed in most cases.

For The Surgery Geeks - Test Your Knowledge - by Alex Walker

1. The gastric mucosa is biologically highly active and this is represented by weight and blood supply.
The gastric mucosa accounts for _____ of the stomach's weight and receives _____ of the gastric blood supply.

a. 35% and 60% b. 35% and 80% c. 50% and 50%
d. 80% and 50% e. 50% and 80%

2. What anatomical abnormalities make up brachiocephalic syndrome?

a. Stenotic nares, elongated soft palate, everted laryngeal ventricles (saccules), laryngeal paralysis, hypoplastic trachea
b. Stenotic nares, elongated soft palate, everted laryngeal ventricles (saccules), laryngeal collapse, hypoplastic trachea
c. Stenotic nares, elongated soft palate, everted laryngeal ventricles (saccules), laryngeal collapse, hyperplastic trachea
d. Stenotic nares, stenotic choanae, elongated soft palate, everted laryngeal ventricles (saccules), laryngeal collapse, hypoplastic trachea.
e. Stenotic nares, elongated soft palate, everted laryngeal ventricles (saccules), laryngeal paralysis, hypoplastic trachea, reduced pulmonary compliance.

3. The rima glottidis is formed by the corniculate processes of the arytenoid cartilages and the vocal folds.
True or False?

4. Dehiscence of an enterotomy is most common between day _____ and day _____ because _____ ?

a. 1 and 2 because a strong fibrin seal has not developed and the closure is reliant totally on the sutures.
b. 1 and 2 because oedema of the intestinal wall causes the wound to be weak and omentum has not had time to form a water tight seal.
c. 2 and 3 because the patient is eating again and the combination of movement and increased intestinal contents increases the risk of leakage.
d. 3 and 4, a combination of vascular compromise at the wound edges and high level of intestinal bacteria increases the risk of leakage.
e. 3 and 5, this is at the end of the lag phase of healing where fibrinolysis has occurred but collagen deposition is still minimal.

5. Diagnostic findings of uroperitoneum include:

a. Radiology - loss of detail to the abdomen.
Abdominocentesis with fluid showing the same creatinine and urea levels as those in peripheral blood. Gradually the urea and creatinine increases as urine is leaked out.
b. Radiology - loss of detail in the retroperitoneal space due to leakage of urine through damaged/inflamed peritoneum.
Abdominocentesis with fluid showing the same creatinine and urea levels as those in peripheral blood.
c. Radiology - loss of detail to the abdomen.
Abdominocentesis with fluid showing the same creatinine and urea levels as those in peripheral blood initially and then urea reduces and creatinine stays high in the abdominal fluid compared with blood.
d. Radiology - loss of detail to the abdomen.
Abdominocentesis with fluid showing the same creatinine and urea levels as those in peripheral blood initially and then creatinine reduces and urea stays high in the abdominal fluid compared with blood.
e. Radiology - a standing fluid line in the abdomen with gas pattern in the small intestine due to ileus.
Abdominocentesis with fluid showing the same creatinine and urea levels as those in peripheral blood initially and then both urea and creatinine reduces in the abdominal fluid compared with blood.

6. Rupture of the contralateral cranial cruciate ligament (CCL), if the stifle has no radiographic sign of degenerative joint disease, occurs in _____ % of dogs within 1 year following surgical treatment of the initial injured CCL.

a. 25% b.50% c. 37% d. 33% e. 60%

7. Biological osteosynthesis is the term given to what process or surgical technique?

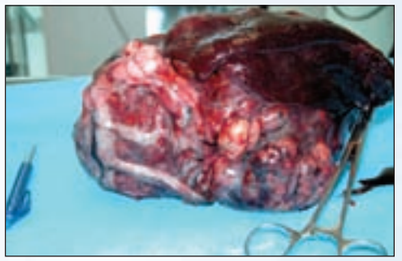
a. The process of fracture treatment where the proximal and distal joints are correctly spatially aligned and the bone shaft is stabilised using AO principles of minimal handling and anatomical reconstruction.
b. The natural process of bone healing that occurs in nature when there is no intervention.
c. The process of fracture treatment where the fracture fragments are reduced, stabilised and compressed with surgical implants.
d. The process of fracture treatment where the proximal and distal joints are correctly spatially aligned and the bone shaft is stabilised using a buttress implant construct without anatomical reconstruction of the bone column.
e. The process of bone healing that occurs when there is a fracture gap and this is filled with cancellous bone graft.

8. The concept of "strain" is important in fracture healing. Why?

a. Strain is defined as the material or gap change in length divided by the original length (△L/L), therefore large gaps have greater strain and bone is only produced by osteoblasts in areas of low strain.
b. Bone is viscoelastic and therefore can form in areas of high strain so small gaps are the best.
c. Strain is measured by a force-deformation curve where a material deforms when loaded. The best implants are those with a steep force-deformation curve because they are strongest.
d. Strain is defined as the material or gap change in length divided by the original length (△L/L), therefore small gaps have greater strain and bone is only produced by osteoblasts in areas of low strain.
e. Strain is actually a term related to ligament injury and has nothing to do with bone healing.

9. This is the medial side of a hindlimb with the paw at the bottom. What is the procedure that has been performed here?

10. This liver mass, removed from a dog, was diagnosed as a massive hepatocellular carcinoma (HCC). Which one of the following statements is true?



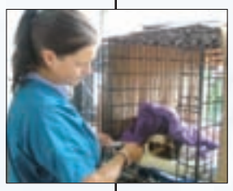
a. Prognosis for patients with massive HCC is poor with frequent metastasis and median survival time of 6 months.
b. Prognosis for patients with massive HCC is good with rare metastatic disease and median survival time of 4 years.
c. Prognosis for patients with massive HCC is good but metastatic disease is common and median survival time of 1 year.
d. Massive hepatocellular carcinoma is rare in dogs with most HCC presenting with diffuse or nodular morphology.
e. Patients with massive hepatic haemangiosarcoma tend to have a better prognosis than carcinoma patients due to better response to chemotherapy.

Please forward your answers to; office@vsg.co.nz by 30/4/08.
Please ensure you include your name, and clinic.
All correct answers will go into the draw for a book by Dr. Terry Fossum, or a bottle of Dom Perignon.

Animal Emergency Centre - by Mark Robson

The Animal Emergency Centre (AEC) is now operational at 97 Carrington Road, Mt Albert, operating out of the VSG Hospital. The AEC aims to raise the bar in terms of the quality of emergency medicine and critical care available in Auckland.

Staffed by veterinarians with a specific interest in emergency care, and with nurses who have the same philosophy, the AEC monitors the VSG surgical and medical patients who are in the hospital and intervenes whenever necessary to help with pain management, fluid therapy and all other aspects of critical care.



The AEC also sees first opinion and referral cases from a wide variety of veterinary clinics in the region, so far ranging from nearby Ponsonby to Northland and Tauranga. Utilising the equipment and information resources of VSG, and with medical and surgical specialists available for back-up, the AEC can offer a much higher level of care than a stand-alone emergency service.

animal emergency CENTRE after hours care

At the moment there are no specialists in emergency medicine and critical care in New Zealand. The AEC makes it very clear to clients that they are not seeing a specialist, but a motivated and well-resourced general practitioner. However it is a stated goal for the AEC to have specialists on staff in 2-5 years, and we are pleased to have hired vets who aim to follow the pathway to specialist status with the support of the AEC owners.

If you are a vet or nurse with an "emergency bent" and wish to enquire about career opportunities in this exciting field please contact Mark Robson (Clinical Manager) on 09 845 5455 or at medicine@vsg.co.nz.