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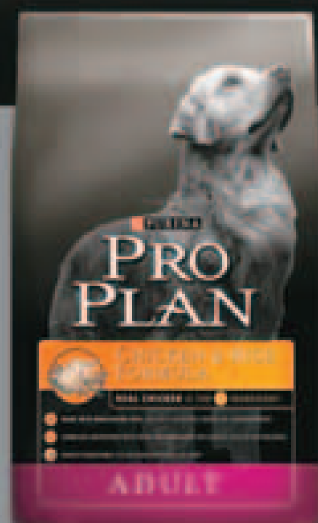

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Veterinary **Specialist** Group

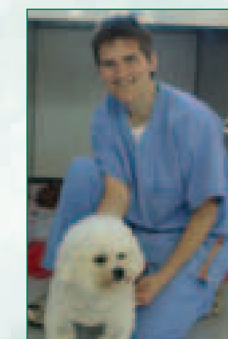
The Next Step

Issue 5. July 2006

EXPERTISE • TECHNOLOGY • COMPASSION

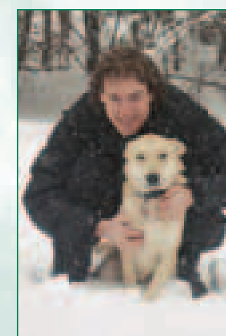
Interns at Large

Emma Davies



I'm presently ending the second year of a three year residency program in neurology at the Royal Veterinary College in London. Although neurology covers all species the majority of the cases I see are cats and dogs. The case load here is high and involves both surgical and medical cases, many of which come in as emergencies. Probably the most exciting thing that I have done has been the surgical stabilization and decompression of an atlantoaxial malformation in a spaniel. I enjoyed my time at VSG and learnt a great deal during my year. I know that the opportunities that I have had are in large part due to the support and encouragement of the team there and I'm very grateful. I'd highly recommend specialist training and have thoroughly enjoyed all of the institutes that I've worked at.

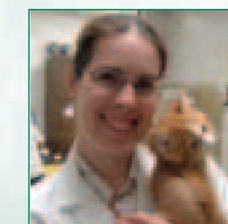
James Sutherland-Smith



I am currently in my second year of a three-year diagnostic imaging residency at Tufts Cummings School of Veterinary Medicine, located outside of Boston, Massachusetts, U.S.A. My residency program is progressing well as I am exposed to a wide array of cases, veterinary specialists and advanced imaging modalities. As well as working, I've had the opportunity to travel extensively within the New England area, as well as visiting California, Washington DC and New York. Making the most of the long snowy New England winters I've taken up cross-country skiing. My sincere thanks to Pfizer and VSG for providing the platform which allowed me to enter a competitive U.S. residency program.

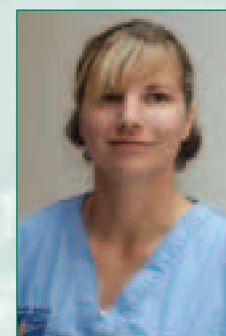
Wendy Archipow

I am nearing the end of a one-year small animal rotating internship at the University of Pennsylvania. UPenn is a busy hospital in West Philadelphia with a strong emergency and critical care department. Highlights of my year here have included assisting in brain surgery and working the night shift in the emergency service. In July I'm off to Indiana to start a 3-year residency in small animal surgery at Purdue University. Many thanks to VSG and Pfizer for their support and for the first step in my specialist career - I wouldn't have made it here without them.

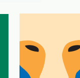


"Wendy with kitten Hubert who had a PRRA"

Thurid Freitag



I completed the Pfizer Internship at Veterinary Specialist Group in December 2005, and left with the ambition to become a specialist in Veterinary Internal Medicine. At present, I am completing a very exciting PhD study about the potential use of bacteriophages (viruses that kill bacteria) as future antimicrobials at Massey University in Palmerston North. With the extensive clinical knowledge I gained at VSG and my completed PhD in hand, I hope to obtain a specialist training position at one of the European or American Veterinary Colleges within the next year. The Pfizer Internship at VSG was an awesome experience. I enjoyed working as part of a great team, and will forever be grateful for the support I received from Pfizer and VSG.



Complications of Multitrauma - The story of Rocky

- by Alex Walker

Steve Withrow famously said that "dogs come with 3 legs and a spare". True, but when dogs are reduced to two functional legs from trauma, the smallest complication can quickly become catastrophic.

I was once told by a renowned orthopaedic surgeon that "once an animal has more than one orthopaedic injury the effect is much greater than the sum of the individual parts". In other words once an animal has lost use of 2 or more legs then the complication rate climbs exponentially. Such is the case of Rocky. Rocky was involved in a vehicular accident in which he fractured his left femur and luxated his right hip. The initial repair was performed well, with the open reduction of the hip and stabilisation with a transarticular pin. The femur was reduced and stabilised with a 9 hole, 4.5mm DCP plate. Reduction was excellent but a small defect remained in the medial cortex. The right hip caused problems so the transarticular pin was removed and a soft tissue technique used to maintain stability. Five weeks post-op Rocky's femoral plate broke (see Fig. 1a) and he was unable to bear weight on his right hip. Referral was made at this point. Clinically, despite the loss of stability of the femoral fracture, Rocky was more painful on manipulation of his right hip. The hip felt reduced so I suspected sepsis to produce this level of pain. Radiographs supported the diagnosis of septic arthritis and femoral osteomyelitis (see Figure 1b). Decision making at this point was critical.

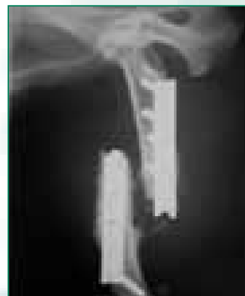


Figure 1a

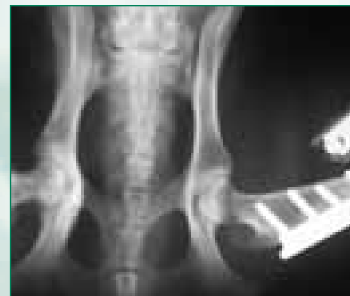


Figure 1b

1. Options for the right hip - not much choice.
   FHO with culture and soft tissue debridement. Physiotherapy was going to be an important part of the recovery of this limb and this was paramount to success of the contralateral femoral repair.
2. Options for the left femur.
   Remove broken plate, reduce and stabilise with a technique that will not have foreign material at the site of infection. Presence of implants makes osteomyelitis very difficult to manage and minimises the chances of bony union. In the femur the best option is a Type 1A or Type 1B external skeletal fixator (ESF). Selecting a frame that will be stiff enough to provide stability in a non-load sharing situation is critical. Using all the knowledge known about increasing stiffness of ESF frames is employed:

1. Increasing number of pins - minimum 2 per fragment.
2. Increasing size of pins.
3. Predrilling pin holes with appropriate guide hole.
4. Use positive profile pins (IMEX or Securos)
5. Using modern clamp design (IMEX SK or Securos clamps are much stiffer then KE clamps)
6. Decreasing the distance from the skin to the bar and adding a second bar doubles stiffness.
7. Frame design influences stiffness - Type III >Type IB >Type II > Type IA.

These were some of the considerations taken into account when choosing the treatment for Rocky. I decided on a Type IA with double bars because I was worried that a Type IB would damage the quadriceps and predispose to quadriceps contracture in such a young dog.

The surgery was performed (see Figure 2). The right hip had lost all articular cartilage and there was no synovial fluid remaining. The femoral head was removed and submitted for culture which grew Enterococcus spp. on enrichment media. Post-operative pain was managed with epidural morphine, constant rate infusion (CRI) Fentanyl (changing to Fentanyl transdermal patch) and Rimadyl. Sensitive antibiotics were maintained for 6 weeks. Over the next 14 weeks Rocky regularly visited our physiotherapist Lindsey Craig who worked mainly on the right hip. We dealt with the many minor problems of ESFs, especially weeping pin tracts. At 10 weeks post-op the frame was reduced to 5 pins and one bar. Clinical union was recorded at 14 weeks post-op (see Figure 3) and the ESF removed. At that time Rocky was bearing good weight on both legs and has gone on to become sound.

Why did this all happen in a case that was handled well initially? Trauma, surgery and anaesthesia all cause immunosuppression. Multitrauma patients often require long surgical procedures and multiple anaesthetic/surgical episodes. Often nutrition is inadequate, further suppressing immunity and predisposing to infection. Strict aseptic technique is paramount. The small medial cortical defect would probably not have been significant if Rocky had three other legs to transfer weight to (remember small gaps are worse than large gaps due to high strain in small gaps) but in this case the plate was loaded without a complete medial buttress. Infection delayed the production of a supporting callus which would have relieved load on the plate. Implant failure was due to a combination of infection and excessive loading due to the problem with the right hip.

I would like to thank both Dr Don Alexander and Mrs Munday for their support throughout the process.

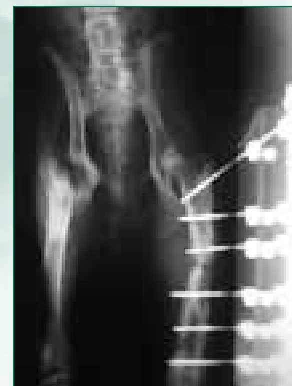


Figure 2

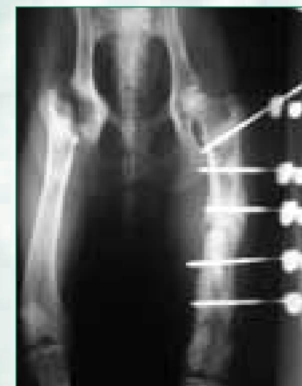


Figure 3

Hard as Rock

- by Jane Finlayson, Backbone Marketing Ltd

It was November 2004 when Rocky acquired the Mundays as his family. Cindy and Kevin found this young Huntaway X, with a big personality, curled up in one of their sheds. No one claimed him and since Kevin is a stonemason Rocky got a new name and a new home which he shares with Cindy's son Jonathan and Kevin's daughter, Karla.

It is a busy household situated on 3.5 acres between Bombay and Pokeno. Along with Kevin's stonemason and landscaping business there is a café and minigolf course on the property. The Mundays also have a cat, Pebbles, three greyhounds, some chickens and a couple of steers.

Every morning as Kevin set out for work down the long driveway Rocky would accompany him, running in front of the truck. One morning in May 2005, Rocky suddenly turned around and ran under the front wheel of the truck. Kevin heard him yelp and carried him down to Cindy. They rushed him to their local vet (Pukekohe Veterinary Clinic), ringing on the way to make sure someone was available to see him.

Rocky had injuries to all four legs. The left back leg was broken, the right was dislocated. One front leg had a loose toe which had to be amputated and the other front shoulder had damaged ligaments. He took a blow to his forehead from which he still harbours a scar.

Once Rocky had been assessed Cindy and Kevin decided to undertake whatever treatment was necessary to repair his injuries. He was a young, tough dog and he deserved a chance. So he underwent a couple of operations.

About four weeks after the operations his leg broke again. When he was x-rayed it was discovered that the plate inserted in his leg had broken and he had developed bone infections in both back legs.

Dr Currall saw him that day and suggested sending his x-rays to VSG for a second opinion. Cindy recalls "I had previously taken a cat of mine to VSG for a scan so was already familiar with the wonderful work they carry out. In their initial report, VSG indicated that they could "heal" Rocky's injuries (instead of just "repair") and that really impressed me."

Their vets arranged a consultation with Alex Walker straight away. The news was positive so Rocky's operation to repair both back legs and treat the infections was performed that afternoon.

It was a long road to recovery for Rocky, he had many weeks of physiotherapy and Cindy used massage to aid his recovery. However his eyes always remained bright throughout his ordeal and he possessed the personality and stamina to get through it all.

Cindy speaks highly of the VSG team, "All the staff, starting from the receptionists through to the surgeons, nurses and physiotherapist, displayed absolute professionalism. I admire their professional expertise and dedication to their work. I felt part of the team helping Rocky walk and run again."

Cindy also talks of the human touch throughout the process. "The VSG team would suggest ways of boosting Rocky's morale with treats and their cups of coffee for me while I waited were always appreciated. We also received a lot of caring and compassion from everyone at Pukekohe Vets. Don Alexander often took time out to ring me inquiring how Rocky was doing".

Although they were expecting a good recovery for Rocky from the day of the operation at VSG, the Mundays and other people are still amazed at his excellent progress. "Rocky is better than ever now. He runs like a race horse and he is certainly in better condition than we could have envisaged on the day of the accident."

Staff Focus: - Urlicha Walker (Leash)

Leash is part of the veterinary nursing team, working in the radiology department.

How long have you worked at VSG?

Five years. I started in May 2001.

What do you enjoy about working at VSG?

The skill levels of everyone here, the toys, the facilities, but mostly the family atmosphere.

What do you enjoy doing on the weekends?

I'll call it socialising!

Tell me about your family

I'm the only child of two very tolerant parents.

What inspired you to become a veterinary nurse?

I was too lazy to do vet, plus have a short attention span. Veterinary nursing seemed the next best option. It's the best choice I ever made!

How many animals do you have at home?

Four. A nutty Blue Heeler with trust issues, and three cats.

What is your favourite meal?

Bluff oysters.

And your favourite TV programme?

After a long day at work any bad reality TV that doesn't require thinking usually does the trick.

What is you favourite holiday destination?

The Far North, Rotorua, or anywhere in the world with a beach.

If you won Lotto tomorrow, what would you spend the money on?

An MRI unit for weekdays, and my own island for weekends.

Urlicha Walker

She'd tell you it hurts,
if she could.
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Echocardiographic Diagnosis - by Darren Fry

The echocardiographic diagnosis of advanced dilated cardiomyopathy (DCM) in the dog is relatively straightforward. Ventricular dimensions will exceed reference values quite markedly in both systole and diastole with a resultant severely reduced fractional shortening. Cases presenting in congestive heart failure will already be at this advanced stage which is usually the end of a degenerative process lasting many months or years. However, diagnosing subclinical or "occult" DCM before this stage has been reached can be very challenging. There are several situations where it may be advantageous to make an early diagnosis of DCM. For example, a decision may have to be made regarding the breeding status of a dog or the dog may be faced with a major surgery which may not be undertaken if early stages of DCM are present. In addition, the early clinical signs of DCM may be subtle and a decision may have to be made regarding early therapeutic intervention. Given the efficacy of new drugs such as pimobendan and the possible role of taurine, L-carnitine and thyroid supplementation in the treatment of DCM, it would be advantageous to be able to diagnose these cases before they have progressed to the easily recognisable "end stage".

In breeds such as Dobermans and Boxers, where ventricular arrhythmias are a major feature of the disease, 24 hour Holter ECG recording can be a very useful early screen. However, in most other breeds, echocardiography has to be relied upon to make an early diagnosis. In these situations, in addition to the "standard" measurements of ventricular internal dimensions and fractional shortening, other parameters have to be taken into consideration:

The sphericity index can be calculated. Dogs with DCM generally have a slightly "spherical" shape to their left ventricle which can be assessed subjectively. However, by comparing the left ventricular diastolic length with the cross-sectional left ventricular diastolic dimension, a "sphericity index" can be calculated.

A ratio of < 1.65 is thought to be abnormal.

Mitral valve E-point to septal separation (EPSS) is thought to be a relatively reliable indicator of left ventricular dysfunction in DCM. In a normal dog in diastole, the mitral valve at maximal opening (the E-point) should closely appose the left ventricular wall. However, in dogs with DCM, this distance is often increased (see Fig 1).

The left ventricular pre-ejection period (PEP) to ejection time (ET) ratio can also be calculated. The PEP is measured from the onset of systole (as judged by ECG monitoring) to the initial opening of the aortic valve. The ET is the time that the aortic valve remains open (see Fig 2). In dogs with DCM, the PEP will be prolonged and once the valve is "forced open", then the ET will tend to be reduced. Thus, a PEP:ET ratio of >0.4 is likely to be abnormal.

Recently, the European Society of Veterinary Cardiology has proposed a "points" system taking into account these criteria in addition to the recognised standard measurements. This points system may well prove useful in the diagnosis of occult DCM and certainly provides a standardised way of assessing and recording these difficult cases.

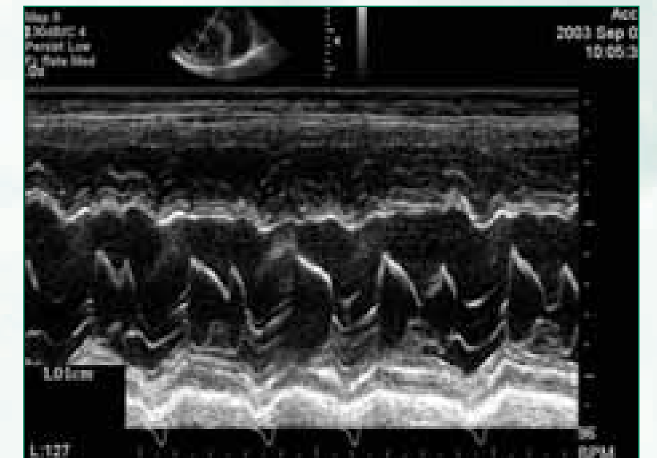


Figure 1 *The distance between the mitral valve at maximal opening and the interventricular septum can readily be measured with M-mode echocardiography. In this case of DCM, the EPSS is increased at 1.01cm.*

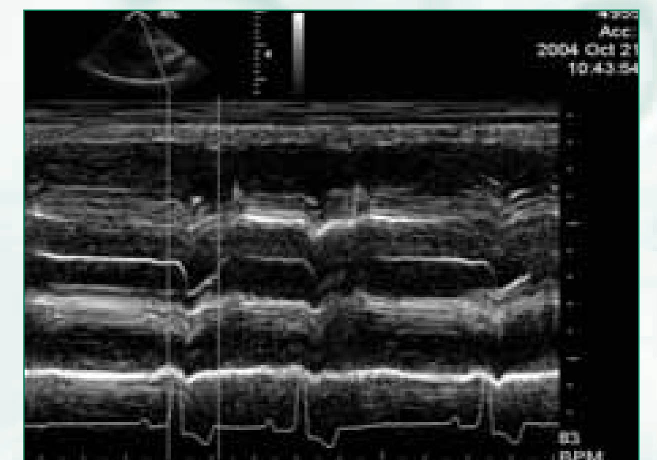


Figure 2 *M-mode echocardiography, with concurrent ECG monitoring can be used to generate the PEP:ET ratio. In this frame, the cursor is placed at the onset of systole and also towards the end of aortic valve opening. Dividing this interval allows calculation of the PEP:ET ratio.*

Cushing's Disease in Disguise - by Mark Robson

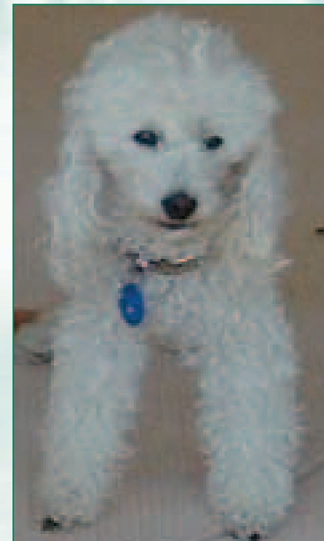
Emma, at the time an 11 year old speyed Miniature Poodle, was presented to VSG in June 2004. There had been a history of an occasional seizure many years previously but no ongoing evidence of a brain abnormality. There was a recent history of an abdominal disorder that had been provisionally diagnosed as pancreatitis.

However by the time we saw her the clinical signs were profoundly worse and of great concern. They had progressed to generalized weakness that was best described as tetraparesis. She could not stand and in fact could only lift her head. She was intermittently panting and had a Grade 3/6 mitral systolic murmur. There was no localizable lesion and her reflexes were adequate, although she started to lose these unilaterally after about 48 hours. Emma presented to us about the middle of the day on a Friday, so we had limited time to do diagnostics before the weekend. Her CBC and chemistry were suggestive of a hepatopathy, and an abdominal ultrasound was basically normal apart from a mildly enlarged liver. Her adrenal glands were of normal size and bilaterally symmetrical.

Her signs were most consistent with neuromuscular disease, and with no cranial nerve signs or neck pain we regarded a brain or cervical spine lesion as unlikely, but not impossible. Hypothyroidism was possible as her T4 was marginal at 6.4 nmol/L, but none of her other signs "smelt" of a hypothyroid crisis. Those dogs are usually hypothermic, mentally dull etc. A disorder such as myasthenia gravis remained a possibility. A chest film showed no sign of megaesophagus but at the time injectable pyridostigmine/edrophonium to check for myasthenia gravis (MG) was not available. I was concerned that if she had MG then we could be on the edge of a truly life threatening crisis. Having said that her attitude was remarkably bright and she was keen to eat and drink. I decided to treat her with oral Mestinon over the weekend on the basis that it was unlikely to hurt if she was not myasthenic and could be life saving if she was. At the same time serum was dispatched to Dr Diane Shelton's neuromuscular laboratory in the USA, but this result would take 10-14 days to come back (and was eventually normal).

Alas, after the weekend Emma if anything looked worse. Testing for an endocrinopathy was performed with an ACTH stimulation and TSH stimulation test. The latter was normal but her post-stimulation cortisol was 1010 nmol/L, which is a strongly positive result and at that level is only occasionally a false positive due to stress.

Emma was started on Lysodren and within 48 hours was showing signs of improvement, and within 96 hours she was walking, having been recumbent for nearly a week. It did take a few weeks for her gait and strength to entirely normalize. Her panting disappeared, and from that point she became a fairly routine Cushingoid for about 12 months. Then she became Addisonian even though she had not received an obvious overdose of Lysodren. Since then she has been a pretty "routine" iatrogenic Addisonian, requiring only hydrocortisone as she did not have electrolyte disturbances.



I have now had 4 cases of Cushingoid tetraparesis over the past 10 years and it remains a fascinating syndrome. I have not seen it written up but have heard anecdotal reports from other internists of similar cases.

The pathophysiology seems to represent an extreme version of the myopathy that afflicts many Cushingoid dogs. This usually presents as lethargy and reluctance to exercise, which often progresses to reluctance to jump onto furniture or into the car. The classic "look" is a dog that gets his/her front legs up onto the couch then looks around for someone to help get the back end up! In fact I use these parameters as good clinical indicators to diagnose Cushing's and also to monitor the efficacy of treatment. The molecular events are poorly understood but are certainly a manifestation of deranged myocyte function as a result of cortisol excess. Muscle wasting is seen, probably as a result of protein catabolism. Interestingly Emma's CPK was normal. Recently Emma has required treatment for her mitral valve regurgitation and has had an extensive dental performed by her primary veterinarian, Dr Goldwater.

Emma represents a perfect example of the relationship between a good general practice such as Howick Veterinary Clinic and a referral institution such as VSG. She was referred when things were obviously not going well, and for other problems that have cropped up along the way, but her routine care and dispensed medications come from her primary clinic. She was close to being put to sleep when things looked bleak early on, but she is pretty much in good health now to the pleasure of her caring owners and veterinarians!

Few clues in Emma's history - by Jane Finlayson, Backbone Marketing Ltd

It was 2 years ago that Emma became ill and had everybody stumped as to what was wrong with her. Now, due to the dedication of her owners Kathy and Gary Christopher, her vets at Howick Veterinary Clinic and the medical team at VSG Emma has overcome a range of challenges.

Emma is a 12 year old miniature poodle who rules the roost in the Christopher family. She lives with Kathy, Gary, two cats and a new kitten. Kathy says "Emma is wilful and very vocal, just ask the team at Howick Vets!"

It was June 2004 when Kathy and Gary noticed that Emma was not herself. She was having trouble getting up onto the bed for her usual snuggle and Kathy assumed old age was starting to creep up on the plucky poodle. Her mobility further deteriorated and soon she couldn't get up on her favourite spot on the couch.

When she started to vomit the Christophers promptly took Emma into Dr Leon Goldwater at Howick Vets, who found she was also suffering abdominal pain. Emma was given IV fluids and antibiotics and initially she showed improvement.

Then in mid May Emma "crashed" again and was back at the vets with general weakness in all limbs and she couldn't stand. Leon says "Emma's presentation was very unusual - it was a real puzzle for us. We worked through the normal differential diagnosis for her symptoms (which included Cushing's disease)

but still were baffled". It was at this point that Leon suggested that Emma be referred to Mark Robson at VSG.

Kathy says that she had not realized that specialists were available for pets and she and Gary jumped at the opportunity to have Emma assessed at VSG.

After the first visit with Mark it appeared that he too was somewhat baffled with Emma's case, however he had several theories. After methodical elimination of some of the theories Mark decided on treatment for Cushing's disease despite few of the classic symptoms being present. Emma received Lysodren and after a week she had improved.

For a year Emma was great, and then she again went down hill. Mark explained that this was the effect of the Lysodren. Emma now had Addison's disease, (the opposite of Cushing's) which can occur inadvertently in some dogs given Lysodren. To overcome this, daily doses of steroid hormones are required. Again Emma responded well.

But the story doesn't end there - Kathy explains "In March this year I had Emma back at Howick Vets and Leon ordered an ultra sound which was performed by VSG's Chris Warman. This confirmed Emma also had a heart murmur and treatment began for that."

Leon says "Emma has responded well again and is lucky to have such dedicated and loving owners. We did a dental on her recently and Mark Robson gave us advice on best practice for this given her conditions. She came through the anaesthetic really well, woke up and began yapping her head off as usual. She's tough and is a real character - it's very rewarding to be involved in a case like this where everyone works together. The end result is the patient and clients are happy."

Kathy can't speak highly enough of her vets and VSG "Our vets had been marvellous - both Howick and VSG have been great. They worked together to overcome Emma's challenges."

She is back to her usual old self and still enjoys both the arrival and departure of Kathy and Gary's grandchildren and as always has a lot to say.

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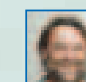

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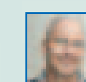

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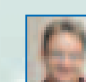

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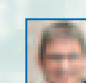

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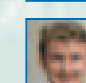

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The Veterinary Specialist Group hospital is located on the Unitec campus situated between Gates 2 and 3 on Carrington Road.