Pioneering Interventional Procedure for Tiny Teddy!

Ground breaking surgery by our very own team has proved size doesn’t matter for Teddy as he was one of the smallest patients in the world to undergo surgery for a congenital heart defect.

Weighing in at just over 2.2kg Teddy was one of the smallest patients to undergo lifesaving heart surgery at Willows. At just eight weeks of age, Teddy was referred to our Specialist cardiology team as he had been diagnosed with a patent ductus arteriosus (PDA).

On presentation, Teddy was dyspnoeic with pulmonary oedema and became easily stressed by examination. Doppler echocardiographic examination demonstrated the PDA and despite the pulmonary oedema, sufficient visualisation was obtained to make the measurements for sizing the device. However there was a marked volume overload of the left ventricle and atrium as a consequence of the PDA, with early systolic failure of the left ventricle.

Urgent surgery was necessary for Teddy, as he was already showing signs of heart failure. The cardiology team at Willows are one of only a few in the UK who can carry out this type of cardiac interventional procedure – this type of procedure has regularly been performed on patients as small as 4kg but until now, 4kg has been the cut off for an interventional procedure of this condition.

Under general anaesthesia the femoral vein was catheterised. The PDA was retrograde catheterised and an angiogram performed under fluoroscopic image intensification. This revealed a moderately large duct, which had an ostium of 3-4mm and an ampulla of 7mm. An 8mm Amplatzer Plug II was then deployed across the ostium of the duct. The Amplatzer Plug was then released from the delivery device. Repeat echocardiography demonstrated no residual ductal flow and there was already improvement in the heart size on the post-procedure scan - an excellent result!
Revel, a 6 year old Labrador

Revel, a 6 year old Labrador presented with sudden onset collapse episodes at rest. He was fully vaccinated and up to date with parasitic treatments. He was reported to have a slow, and regularly irregular rhythm, an ECG was performed and an urgent weekend ECG interpretation was requested.

What is your ECG assessment and diagnosis? How would you investigate this case further? What treatment options are available?

...for the answer see page 10

Online Referred Case Registration Form – £100 prize draw winner

Our online Registration Form is increasingly popular amongst referring veterinary surgeons. Routine case referral can be done at any time of day or night – you just need to fill out some straightforward details and we will contact the client at the earliest opportunity and do the rest for you! It is even quicker to complete the form if you are already a registered member on the Veterinary Professionals section of our website.

As a bonus, using the form automatically qualifies you to enter our free quarterly £100 draw! The latest winner was Alexandra Sharp of Lincvet, Lincoln. On hearing the news of her win, Stephanie said, “Willows are professional and friendly at all times and always provide up to date reports in several forms on the case that has been referred. When I needed a referral at the end of a working day I was put straight through to a clinician with whom I could talk through the case and my client was given an appointment first thing the next day. I would not hesitate to refer a case again”.

To use the system and save yourself time, just visit the Veterinary Professionals section of the website at www.willows.uk.net/vp and follow the link to the Referred Case Registration Form.
Frankel, a 3.5kg male Pekinese, was initially referred to the Neurology and Neurosurgery service for investigation of acute onset non-ambulatory tetraparesis.

CT and MRI revealed atlantoaxial subluxation (AASL) which was stabilised using ventral placed screws and PMMA cement (Figure 1). Frankel made an almost complete neurological recovery over the following four months, but failed to regain normal use of either thoracic limb. When attempting to walk both thoracic limbs abducted perpendicular to the body wall; weight was borne on the sternum and medial aspects of the limbs, with function analogous to that of a seal’s front flippers. Orthopaedic examination revealed bilateral severe medial shoulder instability. A CT scan showed bilateral, minimally displaced, distal scapular fractures, and markedly abnormal relative orientations of the humeri and scapulae (Figure 2). The cause of these problems was not clear, although it is likely that thoracic limb ataxia and paresis associated with the AASL predisposed to traumatic injury.

Several surgical techniques are available for the treatment of severe shoulder instability, including glenohumeral ligament augmentation and transposition of the biceps brachii tendon. Unfortunately, given the severity and bilateral nature of the problem it was considered unlikely that conventional joint stabilisation would be successful. Shoulder arthrodesis can be used as a salvage technique for a number of conditions including severe or recurrent instability, and usually results in surprisingly good function with lameness minimal or absent in most cases. However, the very small size and chondrodystrophic bone conformation in this case significantly increased the technical difficulty of arthrodesis; key challenges included achieving optimal humeroscapular alignment and ideal arthrodesis angles on both sides, the very limited scapular bone stock, the necessity for complex plate contouring, and the requirement for bilateral surgery.

For these reasons 3D-printed bone models and patient-specific osteotomy and reduction guides were created to facilitate surgery. CT data of both shoulders were exported to medical image processing software where triangulated mesh representations of the surface geometry of both humeri and scapulae were created and imported into computer aided design software for manipulation (Figure 3). On each continued...
side virtual reduction of the shoulder joint and two parallel, virtual osteotomies of the glenoid and humeral head were performed (Figure 4). Trajectories for four Ellis pins were superimposed on the meshes, two intersecting the scapula and two the humerus. For each bone a virtual osteotomy guide was created with a contact surface corresponding to a craniolateral segment of cortex, a flat surface in the same plane as the virtual osteotomy plane, and two channels corresponding to the Ellis pin trajectories (Figure 5). The virtually-osteotomised bones, with their corresponding Ellis pin trajectories, were then reduced. In addition, a virtual reduction guide was created, again with a contact surface corresponding to a craniolateral section of the reduced humerus-scapula bone unit, and the four 1.6mm Ellis pin channels (Figure 6). 3D prints of both osteotomy guides, the reduction guide, the humerus, the scapula and the reduced humerus-scapula unit were then produced (Figure 7). Once printed, the reduced humerus-scapula unit models were used...
to accurately pre-contour two locking plates on each side (Figure 8). The ability to contour the plates in advance saved around 45 minutes of operative time, and allowed more precise control of screw trajectories than the conventional intra-operative method.

Both shoulders were arthrodesed under the same general anaesthetic. After a lateral approach to the shoulder, the osteotomy guides were carefully positioned, and two 1.6mm Ellis pins were placed through the channels in each to secure them to the bone. The humeral head and glenoid osteotomies were made parallel to the osteotomy planes of the guides. The osteotomy guides were removed, and the reduction guide applied over the four Ellis pins, automatically reducing the osteotomy (Figure 9). The first pre-contoured plate was applied caudolaterally, the reduction guide removed, and the second plate applied craniolaterally (Figure 10). Post-operative radiographs revealed good alignment of the humeri and scapulae, and good implant placements (Figure 11). Frankel regained the ability to walk unassisted after two weeks, and after four months was able to exercise normally with minimal lameness.

Conventionally performed surgery in this case would have been extremely challenging, and it is very improbable that optimal alignment and accurate implant placement could have been achieved in an acceptable surgical timeframe. These factors will have contributed to the avoidance of complications and good clinical outcome in this case. 3D-printed patient specific guides have similar advantages in other settings and have been used successfully for limb deformity correction, placement of transcondylar screws for the treatment of humeral condylar fissure (IOHC), alignment of highly comminuted fractures, and spinal stabilisations (including fractures and Wobbler surgeries, where precise placement of screws is essential and technically difficult conventionally).

Bill Oxley MA VetMB DSAS(Orth) MRCVS RCVS Specialist in Small Animal Surgery (Orthopaedics)
New services and clinics at Willows

During the past 12 months we have been very busy launching new services and clinics as part of our commitment to continually strive to improve and refine the care and service that Willows provide, not only to our patients and their owners, but also to our referring veterinary surgeons. We have expanded our online services for referring vets, introduced bespoke feline medicine clinics and launched our BOAS clinic and minimally invasive interventional procedures.

NEW ONLINE TELERADIOLOGY REPORTING

Veterinary professionals are extremely busy and, with this in mind, we are now able to provide an efficient provision for all your radiology reporting needs, including reporting on CT-, MRI- and radiographic studies, enabling your practice and patients to benefit from the expertise of our Specialists.

Benefits of the new online teleradiology service:
- Easy to use, online service - using a simple sign-up process - allowing cases to be submitted quickly and efficiently.
- Access to our Specialist reporting teams – with extensive expertise and experience in diagnostic imaging.
- Analysis and evaluation of complex case images, enabling you to provide the best outcome for your patients.
- A unique multi-disciplinary approach – providing input from many Specialists for difficult cases, if required.
- Our online system enables the fast submission of large image files up to 1GB.
- Easy submission of case histories, providing our Specialists with the necessary background information on the case.
- Reports are sent by email to an email address of your choice.

We hope that this new system will make it easy for you to submit your radiology cases for interpretation and reporting.

FELINE SPECIALIST MEDICINE CLINIC

Willows is proud to offer a feline-specific internal medicine clinic, hosted by Stephanie Lalor, one of our European Specialists in Internal Medicine. Stephanie received her postgraduate training at Edinburgh University and was fortunate to be sponsored by International Cat Care. She has also attained the membership of the Australian and New Zealand College of Veterinary Scientists (MANZCVS) Qualification in Feline Medicine. These clinics will be tailored for individual client and patient needs and will reduce stress for feline patients. The clinics are suitable for cats with a diverse range of medical conditions, including:

- Upper and lower respiratory tract disease
- Gastrointestinal conditions
- Infectious disease
- Hepatopathy
- Renal disease
- Urinary tract disease
- Endocrinopathies

Following initial assessment and treatment, ongoing care is tailored for each patient. This often involves follow up examinations, including blood work, urinalysis and blood pressure, and where possible will be done in the owner’s presence. The frequency of these follow up examinations will be adjusted to the patient’s needs. Referring vets will receive a detailed written report after each visit.

We do all we can to minimise the difficulties that cats and their owners might encounter when they come to see us. Our staff are trained to be aware of the needs of cats and their owners, and we have put in place not only the necessary facilities but specific working practices in order to make your patient’s visit as stress-free as possible.

BRACHYCEPHALIC AIRWAY SYNDROME CLINIC

We have also recently launched a new clinic dedicated to the diagnosis and treatment of Brachycephalic Obstructive Airway Syndrome (BOAS). The clinic will be led by Chris Shales, one of our Specialist soft tissue surgeons. Treatment of BOAS can be very challenging, and a team approach involving surgeons, anaesthetists and nurses is essential to achieve the best results.

Willows has had a high caseload in this area for many years and our team has gained a wealth of experience. This new clinic represents an expansion of the current service provision at Willows, to reflect the specific needs of these short-nosed breeds.

Chris would be very happy to visit your practice to discuss this complex condition with vets and nurses. The discussion would include tips on diagnosis and decision-making, and would include numerous videos and images of clinical cases, reflecting Chris’s high level of experience in this area of surgery.

Should you have any queries or require further information about whether an interventional procedure may be appropriate,
MINIMALLY INVASIVE INTERVENTIONAL PROCEDURES

Interventional procedures include interventional endoscopy, interventional radiology, cardiac interventions and other image-guided procedures which allow a minimally invasive approach to treatment of a variety of conditions. The procedures usually use some combination of fluoroscopy, endoscopy and ultrasound, via percutaneous access or through natural body orifices, to access an area of the body and deliver a specific treatment.

As part of the launch of the interventional radiology service at Willows, coil embolisation of complex intra-hepatic portosystemic shunts is now available. Willows has extensive experience in the diagnosis and management of portosystemic shunts, including open surgical treatment of extra- and intrahepatic anomalous vessels where appropriate. The new service will be available for those central and right divisional shunts for which open surgery offers a lower success rate. If you have a case that could have a portosystemic shunt and might benefit from this service, then please feel free to contact Chris Shales in the soft tissue surgery team for more information.

Examples of some of the procedures which our Specialists offer:

Cardiology:

- Interventional treatment of patent ductus arteriosus (PDA)
- Balloon dilatation
- Pacemaker Implantation
- Percutaneous Medtronic Reveal linq loop recorder (implantable event recorder for intermittent arrhythmias)

Respiratory:

- Balloon dilatation or stenting for nasopharyngeal stenosis
- Tracheal stenting for drug-refractory tracheal collapse or other obstructive diseases
- Endoscopic debridement and minimally invasive treatment of sinonasal aspergillosis

Urology/Nephrology:

- Ureteral stent placement for benign or malignant obstructions (cystoscopic in dogs and female cats, surgical in male cats)
- Laser ablation of ectopic ureters
- Laser polypectomy
- Laser debulking of tumours
- Urethral stent placement
- Percutaneous cystostomy tubes for management of urethral obstruction
- Subcutaneous ureteral bypass placement
- Percutaneous perineal approach for male cystoscopy
- Cystoscopic injection of urethral bulking agents for urinary incontinence
- Sclerotherapy for drug-refractory renal haematuria
- Percutaneous antegrade urethral catheterisation for difficult obstructions

Gastrointestinal:

- Management of oesophageal strictures
- Endoscopic polypectomy (upper and lower GI)
- Endoscopic clipping of bleeding gastric ulcers
- GI stenting for stenosis or obstructive neoplasia
- Endoscopic biliary procedures

Vascular:

- Transvenous coil embolisation of intrahepatic portosystemic shunts
- Vascular stenting for obstructive neoplastic disease
- Embolisation (and chemoembolisation) of unresectable tumours

Laparoscopy

- Laparoscopic-assisted procedures, e.g. cystotomy.
- Cholecystectomy
- Elective ovariectomy and cryptorchidectomy
- Liver biopsy

Thoracoscopy:

- Exploration and biopsies
- Pericardectomy
- Lung lobectomy
- Thoracic duct ligation
- Mass resections

Arthroscopy:

- Detailed intra-articular joint examination
- Biceps tendon release for bicipital tenosynovitis
- Minimally invasive treatment for elbow dysplasia including fragment removal and sub-total coronoidectomy

Onology:

- Tumour ablation
- Transarterial embolisation and chemoembolisation
- Stenting of malignant obstructions, e.g. urethra, oesophagus, rectum

please don’t hesitate to contact one of our Specialists for advice: 0121 712 7070 as these procedures are evolving all the time.
New Interventional Endourology Procedures at Willows

Minimally invasive interventional procedures are a rapidly evolving area of practice and offer less invasive treatment options for disease or, in some cases, new treatments for previously untreatable diseases.

The urinary system lends itself particularly well to these techniques as it is easily accessible with a variety of endoscopic approaches. Andrew Kent, one of our medicine Specialists, has received advanced training in endourology and, together with colleagues in soft tissue surgery, cardiology and diagnostic imaging, offers a number of procedures at Willows. The majority of these interventions use a combination of endoscopy (rigid in females, flexible or rigid in males) and fluoroscopy to access the urinary tract and deliver a therapy.

Case Example 1

Cystoscopic Laser Ablation of an Ectopic Ureter:

Lola is a bouncy 1 year-old Labrador who presented to Willows earlier this year with a lifelong history of incontinence and recurrent urinary tract infections. This history is very suspicious for a congenital anatomical abnormality of the urinary tract and therefore investigations into this possibility were advised, namely ultrasound of the abdomen to assess the architecture of the kidneys and then a cystoscopy to examine the lower urinary tract.

Ultrasound of the kidneys was unremarkable, examination of the bladder identified a normal left ureteral jet but an absent right jet. This could suggest an ectopic ureter however the reliability of ultrasound for this abnormality is poor.

Rigid cystoscopy identified a normal left ureterovesicular junction but an ectopic right ureter with a mid-urethral opening. A ureteral catheter was guided into the ectopic opening and fluoroscopy used to map the path of the ureter relative to the urethral wall. This confirmed that this was an intramural ectopic ureter and therefore amenable to laser ablation. This involves passing a flexible laser fibre down the working channel of the endoscope and using it to ablate the medial wall of the ectopic portion of the ureter. This effectively moves the opening cranially. In this case we were able to move the ureteral opening to the same level as the normal left side.

Lola was discharged the same day with a short period of antibiotics and analgesia. The great news is that she has had total resolution of her incontinence and is now enjoying being allowed back on the sofa again!

Ectopic ureters are the most common cause of incontinence in young female dogs and, in most cases, are intramural. Traditionally they were managed with open surgery, however this is associated with a number of potential complications (development of uroabdomen, stenosis at reimplantation site) making laser ablation preferable when appropriate. This procedure is associated with a very low risk of complication (3%) and doesn’t usually require an overnight stay.

It is important to note that many dogs with ectopic ureters will have other concurrent urinary tract abnormalities including urethral sphincter mechanism incompetence (USMI), persistent paramesonephric remnants (PPMR), hydroureter and hydronephrosis. Some of these, for example PPMR, can be treated at the same time as the laser ablation, however concurrent USMI does mean that some cases will have continued incontinence after the procedure that may require further medical or surgical therapy.
**Case Example 1**

**Figures**

- **Figure 1:** Ectopic ureteral opening mid-urethra
- **Figure 2 & 3:** Laser ablation
- **Figure 4:** Abdominal Radiograph with urethral stent
- **Figure 5:** Kidney ultrasound

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**Cystoscopic Ureteral Stent for Obstructive Pyonephrosis:**

Ralphy is a 1 year-old neutered male Cocker Spaniel who presented to Willows recently for further investigation of acute onset vomiting, anorexia, lethargy and pyrexia. This had been accompanied by dribbling of urine and renal abnormalities on ultrasound.

Abdominal ultrasound, performed by one of our diagnostic imaging Specialists, showed a very enlarged right kidney with a markedly dilated renal pelvis filled with isoechoic material. The right ureter was dilated proximally with an obstructing ureterolith present. These findings are consistent with an obstructive pyonephrosis. This condition typically occurs as a sequel to pyelonephritis or nephrolithiasis and leads to formation of a septic focus in the involved kidney. Without treatment the function of that kidney may be irreparably impaired and/or sepsis may result.

Urinalysis showed alkaline urine, pyuria and cultured positive for Proteus mirabilis. This is a urease producing bacteria and is therefore compatible with struvite stone formation.

Traditionally this disease had limited treatment options aside from ureteronephrectomy, however with the development of interventional urology an alternative option exists that allows treatment of the obstruction/infection whilst saving the kidney. This procedure involved perineal access, renal pelvic lavage and placement of a ureteral stent.

A perineal approach is used for some of these techniques as it allows a rigid cystoscope to be inserted into the bladder which has improved image quality and larger working channel size than flexible cystoscopy. This is performed by puncturing the perineal urethra with a needle and passing a guide wire into the urinary bladder. A series of dilator sheaths are then used to stretch the hole up to a size large enough for the endoscope.

Once perineal access is obtained a rigid cystoscope allows identification of the ureterovesicular junction and a ureteral catheter is advanced into this and up to the renal pelvis under fluoroscopic guidance. The renal pelvis is repeatedly lavaged to remove as much purulent material as possible and, finally, a ureteral stent is placed in order to continue drainage from the pelvis and bypass the stone.

Once drainage is restored, the infection can be resolved with a prolonged antibiotic course and the obstructive struvite stone should dissolve.

Ralphy recovered very well from the procedure and was discharged 36 hours later. Urine cultures were then performed regularly to monitor for recurrence of the infection. A repeat ultrasound 3 months later showed complete resolution of the renal changes and the stent was therefore removed, using flexible cystoscopy. Continued urine monitoring will be performed to assess for any recurrence of infection. Some breeds of dog may get obstructive pyonephrosis due to undissolvable stones (for example calcium oxalate), in that case the stent may be left in long-term.

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**Case Example 2**

These cases demonstrate just a couple of the endourology techniques that are possible.

If you wish to discuss whether a minimally invasive treatment might be possible for your patient, please don’t hesitate to contact Andrew or one of our other Specialists.

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Andrew Kent  BVSc  DJDCVIM-CA  MRCVS  
European Veterinary Specialist in Small Animal Internal Medicine
WHAT WAS YOUR ECG DIAGNOSIS?

There is a third degree AV block (complete AV block) with a slow ventricular escape rate. The overall ECG heart rate is ~120bpm although the underlying escape rate is ~65bpm. The ventricular escape is followed by a second ventricular ectopic which is closely coupled and consistent with a re-entry or triggered ventricular beat. Ventricular ectopics are polymorphic suggesting different foci of initiation from within the ventricle. P waves are most readily seen on the baseline in Lead II, however there is no clear coupling to the ventricular rhythm.

How would you investigate this case further?

Full haematology and biochemistry were unremarkable. Cardiac troponin-I, a biomarker released as a result of cardiomyocyte injury, was markedly elevated at 6ng/mL (normal <0.07), consistent with marked injury. Colour Doppler echocardiography revealed normal chamber dimensions and cardiac function however the myocardium, whilst normal thickness, was hyperechoic in places. The ECG showed a stable escape rhythm as shown in the ECG above. Abdominal ultrasonography was unremarkable.

The rhythm here was not slow enough to explain the dog’s collapse, whilst the overall ECG heart rate is 120bpm, the underlying escape rate is ~65bpm and this should be adequate for a dog at rest and collapse would not necessarily be expected.

A 5-day Holter was fitted, however during the analysis, no collapse events were documented. The Holter was then removed and analysed in-house by the Cardiology team. Whilst there were no collapse episodes, important information was ascertained from the Holter.

What treatment options are available?

Paroxysmal ventricular standstill is a life-threatening rhythm and pauses of > 6 seconds are considered sufficient to result in syncope. Treatment of paroxysmal bradyarrhythmias requires pacemaker implantation. Treatment of the faster ventricular arrhythmias could have worsened period of asystole and therefore Revel required pacemaker implantation prior to starting anti-arrhythmics.
Revel underwent pacemaker implantation to address the bradyarrhythmia. A Holter was placed to assess arrhythmias 2 days after pacemaker implantation which demonstrated frequent ventricular tachyarrhythmias at >200bpm. Revel was subsequently started on sotalol. Follow-up Holter whilst hospitalised revealed periods of accelerated idioventricular rhythm (~160bpm) but no fast ventricular tachycardia.

What was the final diagnosis?
Revel was diagnosed with complete AV block with periods of ventricular tachycardia and ventricular asystole, all assumed to be secondary to myocarditis given the persistent elevation of troponin-I. Myocarditis has been shown to be the underlying cause of about a third of all cases of complete AV block. Only a third of myocarditis has an infectious agent isolated. During the acute phase, it is imperative that corticosteroids are not used as these can perpetuate the inflammation. During the chronic phase corticosteroids can be used to reduce the inflammatory phase of myocarditis and in turn reduce the severity of fibrosis seen in more chronic myocarditis. Antibiotics were prescribed in case of infectious causes.

Revel was hospitalised for a week after pacemaker implantation due to his complicated condition. With resolution of myocarditis, cardiac troponin-I reduced and is being monitored regularly.

Take home messages:
- Holter monitoring is an important tool in the collapsing patient. Even if no collapse is documented there can still be useful information to be gained.
- Cardiac troponin-I is a useful test if myocardial injury is suspected such as myocarditis but this can also be elevated with structural heart disease such as dilated cardiomyopathy, arrhythmogenic right ventricular cardiomyopathy, hypertrophic cardiomyopathy and myxomatous degenerative valvular disease, in addition to advanced congenital heart disease.
- Bradyarrhythmias and tachyarrhythmias may also increase troponin levels. Values should be interpreted with caution in the presence of systemic disease which may result in false positive results.
- Pacemaker implantation is the treatment of choice for third degree AV block and sinus node dysfunction with typically good outcomes. The Willows Cardiology team has the largest collective experience for pacemaker implantation in the UK, with one of the busiest and most experienced cardiac intervention services in the world.
2017 CPD at Willows

Willows’ high quality CPD provision continues through to the end of 2016 and on into 2017. We have an entire year’s worth of exciting CPD meetings already planned for 2017, and you can see all the details by visiting our website.

If you would like to receive reminders of our meetings a few weeks before each event, all you need to do is sign up to our email list by registering as a member of the Veterinary Professionals section of our website. In addition to the benefit of email reminders of forthcoming CPD, being a member also allows you to manage your Willows CPD Certificates of Attendance, and to rapidly complete our online referred patient Registration Form.

High quality food and refreshments are provided at our day meetings and evening forums, so why not come and join us for some very tasty CPD!!

**Free Evening Forums**

- Common Ocular Conditions in Brachycephalics
  - Wednesday 11 January 2017
- Neurological examination of the cat and feline clinical cases
  - Wednesday 15 February 2017
- The diagnosis and management of chronic enteropathies
  - Wednesday 22 March 2017
- The diagnosis and management of atopic dermatitis in dogs and cats – an update
  - Wednesday 10 May 2017
- Fissures and fractures of the humeral condyle
  - Wednesday 14 June 2017

**Free Clinical Clubs**

Throughout 2017 we will continue to run FREE informal, interactive Clinical Club evening meetings for practitioners. The Clinical Clubs are generally run once a month and centre around a steeplechase of several case studies which are presented for small groups of 4 to 6 vets to discuss first amongst themselves, followed by further analysis and discussion with our Specialists.

The types of cases presented vary from one evening to another, and they currently encompass orthopaedics, ophthalmology, neurology, internal medicine and nutrition, soft tissue surgery, dermatology, critical care, anaesthesia, oncology and cardiology. The numbers are strictly limited to 20 delegates per evening, and you must register for these events online - so please check our website regularly for information about these popular events.

**Day Meetings**

- Treatment of Brachycephalic Patients
  - Wednesday 15 March 2017
- Feline friendly nursing
  - Wednesday 17 May 2017
- Broken bones, torn ligaments, skin grafts and trenchfoot – medicine and surgery of the distal limb
  - Wednesday 06 September 2017
- Hot topics in feline medicine and surgery
  - Wednesday 15 November 2017

To view and book your CPD simply visit the CPD section on our website: [www.willows.uk.net/cpd](http://www.willows.uk.net/cpd)