AMVS Event Updates!

Unfortunately the Paws Across the Rockies Event on Saturday, August 18th was cancelled but thankfully Dr. Rachel Carson-Bowlus provided an informative presentation on the necessity for CT and MRI imaging in the veterinary field ending our August events with a bang. Please come out for our next CE event, The Lyons CE on September 29th. (Details listed in the Upcoming CE section below)

Upcoming Events!

Please join us as we participate in some events in our community.

September 1st & 2nd
AMVS will be sponsoring the Brainard Portal Restoration and Trail Project with the Wildlands Restoration Volunteers (WRV) non-profit organization. Disturbance around the
(WRV) non-profit organization. Disturbance around the portal is in desperate need of restoration and the portal needs a trail connection to the trail system. WRV volunteers will construct 450 feet of trail, plant 500 or more native trees and shrubs, install erosion matting, plant seeds, and stabilize and revegetate the eroding slope by the booth entrance.

To volunteer please visit WRV's website by clicking their logo below:

Thursday, September 13th From 6-9 pm
AMVS will be sponsoring the Longmont Humane Society's Homeward Bound Harvest event that includes food from 15 restaurants, live music, wineries, breweries, and distilleries, an animal fashion show, and live and silent auctions. Tickets are $75.00 and can be purchased by clicking on the icon below:

Friday, September 21st
We will be at the ArtWalk of Longmont from 6 to 9pm in downtown Longmont, between 3rd & 6th Avenues. The ArtWalk event is a free evening of art exhibitions, music, live theater, dance and children's activities. Last time was a blast and this is the last art walk of the year, so we hope you can make it!

Saturday, September 22nd
Is Responsible Dog Ownership Day. AMVS will be celebrating this day at the Longmont Zoom Room located at 2318 17th Avenue in Longmont, CO 80501, next to the Starbucks on 17th and Hover! Leash up your loved ones and head on over
17th and Hover! Leash up your loved ones and head on over from 10:00am to 2:00 pm.

Upcoming CE's

AMVS and Pfizer Pharmaceuticals are teaming up to provide you, the Veterinarian with the ultimate outdoor CE experience:
The Outdoor CE in Lyons, CO which includes your choice of Mountain Biking, Hiking, Fishing and Road Biking!
For More Info Call 303.678.8844
and ask for Alyssa

Medical versus Surgical Management of Canine Hip Dysplasia
By: Robyn Read, DVM Surgical Resident

Practice Points:

- Canine hip dysplasia is characterized by hip joint laxity that results in abnormal load on the joint which then leads to inflammatory and eventually degenerative changes like osteoarthritis.

- Weight reduction is the mainstay of medical management.

- Juvenile pubic symphysiodesis must be performed between 12-16 weeks of age for best results. The goal is more dorsal coverage of the femoral head by the acetabulum.

- Triple pelvic osteotomy is performed by 10 months of age usually or before radiographic osteoarthritis is noted. New locking plates and screws are decreasing complication rates with this procedure.

- Total hip replacement is a salvage procedure but clinical outcomes are very good. Complications like
infection, luxation, and fissure fractures of the femur can be catastrophic if they occur. Reported complication rates are around 10%.

Canine hip dysplasia (CHD) is a heritable condition that results in laxity of the coxofemoral joints and it is one of the most common orthopedic diseases affecting dogs. In young dogs, CHD is coxofemoral subluxation, joint capsule stretching, cartilage erosion, and subchondral bone fracture that produces pain and lameness. Laxity results in abnormal joint loading, causing osteochondral damage, and initiation of inflammatory and degenerative changes (osteoarthritis, OA) often seen in middle aged and older dogs.

Treatment of CHD can be broadly categorized into surgical and nonsurgical management. Surgical options include juvenile pubic symphysiodesis (JPS), triple pelvic osteotomy (TPO), femoral head and neck ostectomy (FHO), and total hip replacement (THR). Nonsurgical management typically involves a multimodal approach, including but not limited to: weight reduction, activity restriction, pain management, acupuncture, professional rehabilitation, and modulation of joint disease by polysulfated glycosaminoglycans, mesenchymal stem cells, and extracorporeal shock wave therapy. The decision to pursue surgical treatment in a dog with CHD is typically based on owner's expectation of the dog's intended use, the dog's physical condition, the owner's financial resources, and the risk-benefit analysis of surgical versus nonsurgical options.
physical condition, the owner's financial resources, the surgeon's experience, and the response to non-surgical treatment of CHD.

The nonsurgical management of CHD and OA encompasses a wide range of therapies and, unfortunately, the evidence presented in the veterinary literature that looked at modulation of joint disease through the use of polysulfated glycosaminoglycans, Omega 3 fatty acids, mesenchymal stem cells, acupuncture, and extracorporeal shockwave therapy report conflicting evidence on the benefits of these modalities. More evidence derived studies from multiple, randomized, blinded, placebo-controlled investigations of these modalities and professional physical rehabilitation would be beneficial in veterinary medicine. The current dogma based on anecdotal and evidence in the literature is that polysulfated glycosaminoglycans and Omega 3 fatty acids are safe and may help provide building blocks to maintain joint and cartilage health.

Weight Control has been experimentally and clinically shown to be an important aspect of preventing and managing OA secondary to CHD. Smith et al. published a cohort study where 48 Labrador Retrievers in the Purina research colony were followed from birth until death. Half of the dogs were fed ad lib and the paired litter mate was fed 25% less than what the ad lib dog ate. The ad lib fed dogs developed radiographic evidence of coxofemoral OA at a mean age of 6 years whereas the littermates who were fed 25% less did not develop similar OA signs until 12 years of age. By the end of the study at 14 years, 83% of ad lib fed dogs had radiographic evidence of OA compared with only 50% of limit fed dogs. Interestingly, dogs in the limit fed group lived 2 years longer than the ad lib fed group.

Dr's Matthew B. Rooney, (DVM, MS DACVS Surgical Specialist and Practice Owner) and Trent Gall's (DVM, MS, DAVCS, Surgical Specialists) medical management protocol for CHD includes weight loss (ideal BCS 4-5/9), regular moderate exercise, pain management, 5mg/kg Omega 3 fatty acid/day, and Dasuquin. Several studies are available on the surgical management of
Several studies are available on the surgical management of CHD and the most recent and/or most cited are discussed here.

Juvenile Pubic Symphysiodesis (JPS) is a preventative, minimally invasive surgical intervention for immature dogs between 12-16 weeks of age that are at risk for the development of CHD. Premature closure of the pubic symphysis is induced by thermal destruction of the symphyseal growth plate using electrocautery. The procedure results in an increase in ventral rotation of the acetabulum during continued growth with the goal of decreasing hip laxity, better joint congruity, and prevention of OA. No postoperative morbidity has been reported in clinical studies and there is no need to restrict activity postoperatively beyond precautions to protect the incision. JPS is easy to perform but requires electrocautery and must be performed at an early age, ideally less than 16 weeks of age.

A two year clinical outcome study performed by Dueland et al. found that early JPS (prior to 16 weeks of age) significantly decreased hip laxity scores (PennHIP distraction index and Ortolani sign) and decreased pain on hip extension at 2 years post-op in the JPS versus control group puppies. Radiographic evidence of OA in the control group increased by 57% in two years whereas radiographic evidence of OA increased by only 11% in the JPS group. The JPS group did not have a significant change from pre-op and the control group did show a significant increase in OA. The JPS group had 91% positive Ortolani signs pre-op and only 27% of these dogs had a positive Ortolani sign at 2 years post-op. The control group had 100% positive Ortolani sign pre-op and 92% of those dogs were still Ortolani positive at 2 years.
The Triple Pelvic Osteotomy (TPO) is a prophylactic surgical intervention intended to decrease hip joint laxity by increasing the acetabular coverage of the femoral head. Candidates for TPO are young dogs with clinical signs of hip dysplasia with palpable and/or radiographic hip laxity. Dogs that are a good candidate for TPO can be up to 10 months of age with little to no radiographic evidence of OA. Hip laxity is best assessed clinically via an Ortolani test on a sedated or anesthetized dog. TPO is an accepted, proven treatment for CHD in this population of dogs. Clinical studies show subjective improvement in dogs after TPO with 92% to 93% satisfactory limb function postoperatively. Kinetic gait analysis is held by many surgeons as the best objective outcome for lameness measures. Significant increases in peak vertical force of dysplastic limbs occur as early as 8 weeks after TPO and values for peak vertical force reach normal by 28 weeks postoperatively. The most commonly reported complication after TPO surgery is screw loosening and/or pullout. Screw loosening was reported as 62% in one study; however the use of locking screws and new locking plates has significantly decreased that complication rate. Obstipation and dysuria are uncommonly reported complications due to pelvic canal narrowing.

Rasmussen, et al. published a study on preoperative variables affecting long-term outcome with TPO. Approximately 40% of dogs in the study had progression of DJD. Eighty-seven percent of dogs received excellent or good physical examination scores postoperatively, and 76% received excellent or good at-home activity scores by owners. The risk of DJD was increased with increased age at surgery, narrower preoperative Norberg angle, and lower percentage of femoral head coverage, but these variables were not associated with post-op clinical hip function. This study concluded that TPO for treatment of CHD in dogs may slow, rather than stop, radiographic progression of DJD; however, clinical outcome is acceptable for most dogs.

The functional outcome of Femoral Head and Neck Ostectomy (FHO) may be affected by several factors including: surgical technique (removal of entire femoral neck), duration of clinical signs preoperatively, patient age, postoperative care and physical therapy, body weight and disease severity. Body weight is the most commonly investigated factor in outcome. Dogs weighing less than 17kgs generally have better results than larger dogs. Patient age is not always a consideration in otherwise healthy dogs; however, younger dogs generally have a better outcome.
however, younger dogs generally have a better outcome than older dogs.

Off, et al. conducted a prospective study of 132 dogs and 51 cats undergoing FHO. The patients were followed for a mean of 4 years after surgery (range 7 months to 10 years). Subjective and objective post-operative data showed that 84% of patients had limb shortening due to caudodorsal displacement of the proximal femur, 75% had muscle atrophy, 74% had reduced range of motion in the hip, 56% had lameness, 32% showed signs of pain during passive range of motion, and 10% had palpable crepitus. Dogs that weighed more than 15kgs tended to do worse than smaller patients in this study. Cats had the fewest problems on the subjective post-operative analysis. Based on the information from a client questionnaire combined with the results of clinical re-evaluations and object data, the functional results were considered good in 38% of the patients, satisfactory in 20%, and unsatisfactory in 42% of patients. Preoperative clinical signs were present for a mean of five weeks in patients with good results and a mean of seven weeks in patients with poorer outcomes.

Total hip replacement (THR), or arthroplasty, is a salvage procedure involving replacement of the diseased acetabulum and femoral head with implants. Commercial systems are available for both cemented and cementless total hip components and currently published comparisons between the two types of implants are inconclusive. Micro THR implants are now available for small dogs and even cats. A recent report using force plate analysis showed that THR is very effective for returning dogs to normal weight bearing as early as 3 months postoperatively. THR is indicated for only skeletally mature animals or dogs at least 10 months of age. THR is contraindicated in animals with systemic health issues that may result in increased risk of infection or slow healing. Best results are generally reported in animals with minimal muscle atrophy and in those that
have been partially weight bearing prior to the procedure. Since surgical complications can be devastating when they occur, THR should be reserved for when medical therapy is no longer an option.

Forster, et al. reported on complication rate and owner assessment of outcomes with total hip replacement. One hundred and seventy cases met the inclusion criteria. Surgical indications included hip dysplasia and coxofemoral osteoarthritis (n = 150), Legg-Calves-Perthes disease (7), coxofemoral luxation (6), fracture (4), slipped capital physis (2), and femoral head and neck ostectomy revision (1). Surgical implants were from 4 different systems. The incidence of surgeon-reported complication was 9.4%. No significant association was identified between weight, age, sex, breed, indication for THR, surgical technique and prosthesis, and the incidence of complications. In 82% of the cases, owners described their satisfaction with the outcome of THR as "very good" and a 20% complication rate was reported by owners. There was a statistically significant improvement in owner-assessed questionnaire score before and after THR (P < .001).

We currently utilize all of these surgical options at AMVS and we will counsel owners on medical management before performing any salvage procedures for CHD. JPS and FHO are relatively simple procedures that can be performed without expensive implants and equipment but must be performed by 16 weeks and 10 months of age, respectively. Our surgeons, Dr. Rooney and Dr. Gall, as well as our surgical residents and interns, would be happy to discuss any of these procedures along with our protocols for medical management. Please give us a call if you have any questions about performing an Ortolani test, PennHIP radiographs, JPS and/or medical versus surgical management of canine hip dysplasia.

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Rasmussen, LM: Preoperative variables affecting long-term outcome of triple pelvic osteotomy for treatment of naturally developing hip dysplasia in dogs. JAVMA 1998
Forster, KE: Complications and owner assessment of canine total hip replacement. Veterinary Surgery 2012

Robin Read DVM, Surgical Resident
Aspen Meadow Veterinary Specialists

Whats New At AMVS??

Laparoscopy now available at AMVS, pricing included!

Minimally invasive surgery - Not just for people anymore!
In human medicine, minimally invasive surgery (laparoscopy and thoracoscopy), also called "keyhole surgery", is becoming commonplace. While these minimally invasive techniques are still on the threshold in veterinary medicine, the many benefits to patient comfort and speed of recovery are making laparoscopy and thoracoscopy a popular surgical modality among many veterinary surgeons.

What exactly is laparoscopy and thoracoscopy?
The word laparoscopy derives from Ancient Greek: λαπάρα (lapara), meaning "flank, side", and σκοπέω (skopeo), meaning "to see". It is a surgery performed in the abdomen with the aid of a camera using small incisions (usually 0.5-1.5cm). The technique can either be used to inspect and diagnose a condition or to perform an actual surgery. Laparoscopy is considered "minimally invasive," a term used to describe surgery that is as atraumatic as possible, especially when compared to open abdominal surgery. Laparoscopy is performed by making very small incisions (in
many cases only 5mm in size) and then inserting a laparoscope, or camera, into the abdominal cavity. The abdomen is then insufflated, meaning filled up with carbon dioxide (a safe, absorbable gas), so all of the organs in the abdomen can be easily visualized. The images are captured by the tiny camera and then magnified and viewed on a monitor in the surgery suite.

Through these images, even the tiniest structures can be easily examined. With some procedures, no additional incisions, apart from this one small incision, are required. However, if need be, biopsies can be taken by creating additional small incisions for the instruments. If additional entries or ports are needed, they are usually only 6-12mm in length.

What are the uses for laparoscopy and thoracoscopy in Veterinary Medicine?
These techniques can be used for both diagnostic and therapeutic indications. Many times in both human and veterinary medicine a disease process is suspected, but can only be confirmed through the analysis of organ structures microscopically by obtaining specific tissue samples (biopsies). Fortunately, laparoscopic/thoracoscopic techniques offer a minimally invasive approach for collection of high-quality biopsy samples from multiple organs during one anesthetic episode.
A specific example of a common surgery that is ideal for the use of laparoscopy is the removal of cryptorchid testicles.
use of laparoscopy is the removal of cryptorchid testicles that have not descended from the abdomen. During traditional open abdominal surgery the incisions are several inches long. The surgery time can be extensive while trying to locate a testicle in the abdomen. However, using laparoscopy the testicle can rapidly be located and removed, making this potentially tedious and invasive surgery much more efficient and atraumatic.

Cryptorchid Removal Via Laparoscopy

Gastropexy is another example where laparoscopy is an ideal surgical technique. This procedure is performed to prevent a potentially life-threatening, and unfortunately common, condition known as gastric dilatation volvulus, or bloat. This surgery involves permanently tacking the stomach to the body wall to prevent the stomach from twisting. The typical incision length in open abdominal surgery would be greater than 6-8 inches, but laparoscopically assisted, only 1-2 incisions one-half to 2 inches in length are necessary.

Thoracoscopy has become a very useful technique for procedures such as pericardectomy and permanent thoracostomy drain placement for diseases such as pericardial and pleural effusion, respectively. Having the ability to do thoracic procedures thoracoscopically makes these once very invasive procedures much easier on our patients.

What are the benefits of laparoscopy/thoracoscopy versus laparotomy/thoracotomy (open abdominal surgery)?

There are a number of advantages to performing laparoscopic surgery versus an open procedure. Smaller incisions make laparoscopy less painful for patients.
incisions reduce postoperative pain and shorten recovery time, as well as minimizing post-operative scarring. Less pain postoperatively means less pain medication may be needed to keep a patient comfortable during the healing process. Although procedure times are usually slightly longer, the post-operative hospital stay is often less—in many cases, these minimally invasive procedures can be performed as an outpatient procedure.

A 2005 study was published in the Journal of the American Veterinary Medical Association which showed the clinical advantages of the laparoscopic-assisted ovariohysterectomy versus open technique. The study demonstrated that: "Laparoscopic assisted spays offered up to 65% less pain and less surgical stress than the traditional open spay. (1)

Another tremendous benefit of minimally invasive surgical techniques is they have few complications (a less than 5% complication rate). Laparoscopic and thoracoscopic surgery have been associated with decreased risk of hemorrhage, dehiscence, infection, and patient body heat loss during procedures compared to more common open approaches.

**When will this type of surgery be available for our pets?**

While laparoscopic surgery is considered the gold standard for a wide variety of procedures in human medicine, it is still only rarely performed in animals. This fact is shocking because just as in humans, our pets would also benefit from the many advantages, such as: fewer risks of post-operative wound complications and significantly less pain when compared to open abdominal surgery.

Fortunately Aspen Meadow Veterinary Specialists offers laparoscopic surgery to our patients. Our boarded surgeons Matthew Rooney DVM, MS, Diplomate American College of Veterinary Surgeons and Trent Gall, DVM, MS Diplomate American College of Veterinary Surgeons and our surgical residents Jim Perry, DVM, PhD Diplomate ACVIM (Oncology) and Robyn Read, DVMare specially trained in these procedures. We offer laparoscopic/thoracoscopic surgery for the following procedures:

1. Feeding tube placement
2. Gastropexy
3. Renal, liver, pancreatic, and gastrointestinal biopsy
4. Spay/Ovariohysterectomy
5. Cryptorchid surgery
6. Adrenalectomy
7. Cystoscopy (scope assisted cystotomy) - removal of urinary calculi (4) and resection of inflammatory polyps in
urinary calculi (4) and resection of inflammatory polyps in
the bladder
8. Pericardectomy and auricular mass removal
9. Permanent thoracostomy drain placement for benign and
malignant effusions

Depending on the procedure required, laparoscopic surgical
fees are between $1,650 and $1,800; this does not include
anesthesia costs. Laparoscopic/thoracoscopic procedures
offered at AMVS are listed above. This fee includes the
laparoscopy surgical fee, carbon dioxide, laparoscopy
supplies and instruments, and placement of sutures or skin
staples, as well as biopsy analysis and cultures, if indicated.
Costs associated with anesthesia and further diagnostics, as
well as a consult with one of our surgeons, are in addition to
the fees listed above. When possible, diagnostics, such as
preoperative blood work, can be performed with the rDVM
prior to surgery at AMVS. At the initial consult, an estimate
will be created for the client tailored to the specific needs of
the patient. This estimate will include all necessary items
associated with the procedure. If you have any questions, or
for more information please contact AMVS.

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43(6): 342-6

(6) Laparoscopic cryptorchidectomy in dogs - report of 15

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Thank you for your continued support!
-Aspen Meadow Veterinary Specialists

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