

Top 10 Orthopedic Conditions

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Introduction

- Evaluation of orthopedic conditions need not be difficult
- Most diagnoses can be made with orthopedic examination and radiographs
- Knowledge of the most common conditions and their history and signalment helps to prioritize the differential diagnoses
- Soft tissue conditions increasingly recognized, especially in working and athletic dogs
 - Suspect on physical examination, but ultrasound and MRI used to confirm the diagnosis and evaluate the extent

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Top 10

- 1. Osteoarthritis
- 2. Cranial Cruciate Ligament Disease
- 3. Hip Dysplasia
- 4. Elbow Dysplasia
- 5. Luxating Patella
- 6. Osteosarcoma
- 7. Soft Tissue Shoulder Conditions
- 8. Iliopsoas Strain
- 9. Osteochondrosis, Panosteitis
- 10. Trauma

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#1 (2 and 3). Osteoarthritis

- Virtually any orthopedic condition can result in osteoarthritis
- Therefore, it is the most important orthopedic condition and the one that practitioners will spend the most time managing
- Remember, up to 60% of adult dogs have radiographic signs of osteoarthritis

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#2. Cranial cruciate ligament rupture (partial and complete)

- CCLR suspected with any gradual or sudden onset of pelvic limb lameness
- Surgical techniques include extracapsular repair, tibial plateau leveling osteotomy, and tibial tuberosity advancement
- Inadequate surgical and postoperative treatment may result in joint stiffness, muscle atrophy, lameness, and poor function
- Proper surgical intervention and the appropriate use of physical rehabilitation techniques in combination with pharmaceutical agents necessary to achieve optimal outcome

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Cranial Cruciate Ligament Rupture

- Several studies have indicated a positive benefit to various forms of postoperative physical rehabilitation for patients with CCLR
- Rehabilitation documented to improve muscle mass and attenuate muscle atrophy that occurs following surgery, increase joint ROM, especially stifle extension, improve weightbearing as measured by force plate analysis of gait, and reduce the progression of OA

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#3. Hip dysplasia

- An abnormal development of the hip joint, usually bilateral
- Primarily medium and large breed dogs
- Causes are multifactorial and include genetic predisposition, rapid growth rate, and diet
- Hips develop instability between 4 and 12 months of age and may exhibit difficulty rising, decreased activity level, 'bunny-hopping' gait, and muscle atrophy
- Diagnosis made by palpating joint laxity (subluxation)
- Radiographs may appear normal, although subluxation may be evident. Penn Hip valuable in determining degree of laxity

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Hip Dysplasia



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- With progression, periarticular fibrosis causes some joint stability and the pain may be significantly decreased
- With further progression, osteoarthritis results in pain, crepitus, decreased range of motion, waddling gait, and reluctance to stand
- Thigh and hip muscles atrophy and shoulder muscles may hypertrophy
- Radiographs show varying degrees of osteoarthritis with remodeling of the femoral head and acetabulum
- Rate of progression varies between individuals and is difficult to predict. Some dogs may have degenerative changes by 1 year of age, while many individuals develop advanced OA in mid-life or later

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Hip Dysplasia



Eburnation
flattening of
femoral head

Osteophytes and
thickened femoral neck

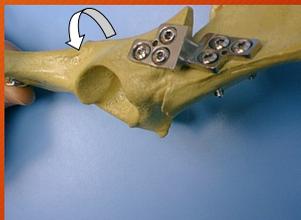
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Surgical Management - Young

- Surgical procedures designed to change joint alignment to improve joint stability and slow OA progression
- Most common are triple pelvic osteotomy (TPO) and juvenile pubic symphysiodesis (JPS)
- TPO if have early signs of hip dysplasia and joint laxity, but have not progressed to having significant radiographic OA. Most dogs between 4 and 10 months of age
- Postoperatively, activity restricted for 4 to 6 weeks to allow healing
- Cryotherapy, NSAIDs, PROM, and assisted ambulation for two weeks, followed by controlled, low-impact therapeutic exercises to strengthen muscles

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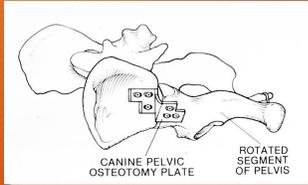
Hip Dysplasia



Triple Pelvic Osteotomy

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Triple Pelvic Osteotomy



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Surgical Management - Young

- Juvenile pubic symphysiodesis performed in dogs between 16 and 18 weeks of age considered at risk for developing hip dysplasia
- The pubic symphysis is surgically damaged, causing it to fuse and alter pelvic growth
- These puppies are often clinically normal and the surgical trauma is minimal

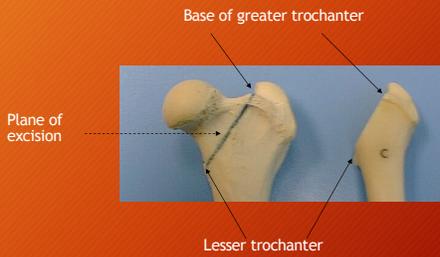
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Management in Mature Patients

- Dogs with mild or intermittent signs of hip dysplasia may be treated conservatively to limit OA progression
- NSAIDs, DMOAs, diet and exercise
- If pain not adequately managed by conservative methods, there are two salvage surgical options: total hip replacement (THR) or femoral head and neck ostectomy (FHO)
- Both procedures eliminate the joint, eliminating pain
- In general, THR is not an option after an FHO has been performed

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Femoral Head and Neck Excision



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- THR involves replacing the acetabulum with an acetabular prosthesis and the femoral head with a femoral stem and ball
- The prostheses are secured with bone cement or bone ingrowth
- In the initial postoperative period, NSAIDs, cryotherapy, and gentle passive ROM are indicated
- Most common postoperative complication is hip luxation
- The dog is supported with a sling to prevent abduction of the limb and dislocation of the prosthesis for 2-4 weeks
- Muscle strengthening achieved with walking, treadmill activity and sit to stand exercises. Balance and proprioception reeducation also important
- Restrict to leash walking, with no running or jumping for 3 months

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Hip Dysplasia



BioMedrix Canine Hip Prosthesis

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#4. Elbow dysplasia

- FCP, OCD of the medial condyle of the humerus, and UAP referred to as elbow dysplasia
- Most common in large or giant breeds of dogs
- Males more commonly affected
- Likely genetic components
- Common to occur in both elbows, although typically worse on one side
- Usually have only one of the three conditions, rare to have all three components of elbow dysplasia

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#5. Luxating patella

- Most commonly related to abnormalities in hind limb conformation
- Medial luxations more common than lateral
- Cranial cruciate ligament rupture present in 15 to 20% of middle aged and older dogs with chronic patella luxation
- Classified from grade 1 to grade 4, with 4 being the most severe
 - Based on degree of clinical signs, ease of patella luxation and reduction, and severity of bony abnormalities
- Surgery indicated when gait abnormalities or lameness present

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Luxating Patella Surgery

- Requires soft tissue reconstruction and bone realignment
- In almost all cases the tibial crest is transposed and pinned
- Deepen the trochlear groove also performed in many cases
- Capsulectomy or imbrication of soft tissues on the redundant side
- Active limb use encouraged, but initial activity should be limited to short leash walks and jumping is not allowed
- Motion should be limited to the sagittal plane to avoid stress on the repair
- Prognosis is generally fair to good for grades 1-3, but guarded for grade 4 luxations

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#6. Osteosarcoma

- Very common in large and giant breeds of dogs
- Affects two primary age groups: 2 year old dogs, and dogs that are 5-7 years of age
- Locations are away from the elbow and toward the knee (proximal humerus, distal radius, distal femur, and proximal tibia)
- Radiographic signs may not be apparent initially. Therefore, if a diagnosis is not obtained on radiographs, the clinician should not be afraid to repeat radiographs in 2-4 weeks if the lameness is progressively worsening
- Generally quite painful on palpation, and swelling of the affected bone may be profound

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#7. Soft tissue shoulder conditions

- Biceps tenosynovitis
- Medial shoulder instability
- Supraspinatus muscle and tendon
- Infraspinatus muscle and tendon

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Biceps tenosynovitis

- Degenerative process of the biceps tendon and tendon sheath
- Commonly in middle- to older-aged large breed dogs
- Variable weight bearing lameness
- Flexion of the shoulder with simultaneous extension of the elbow joint increases tension on the tendon, resulting in discomfort
- Pain on palpation of the bicipital groove region
- May occur in conjunction with shoulder OA or glenohumeral ligament damage
- Diagnosis can be difficult and is sometimes made by diagnostic ultrasound, MRI, or during arthroscopy

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• Conservative management involves rest and injection of PRP or stem cells in the tendon under ultrasound guidance

• Pulsed mode 3 MHz therapeutic ultrasound may be used

• NSAIDs and cryotherapy

• Improvement may also be seen with up to three injections of corticosteroids at 2 to 4 week intervals

• Up to a 50% response rate with conservative therapy, but the condition is often nonresponsive to conservative treatment or recurs with active exercise or work

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• If fail to respond to conservative measures, surgical release of the biceps tendon alone, or surgical release and re-attachment to the proximal humerus with a bone screw and spiked washer performed

• Post-surgical physical rehabilitation is important: Cryotherapy, PROM, and short leash walks for 3 weeks

• Then gradual strengthening exercises, especially to the brachialis muscle to help improve the animals ability to flex the elbow joint

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Medial Shoulder Instability

• Increasingly recognized as a source of forelimb lameness

• Frequency may also be increasing with agility competitions which require rapid turning, and jumping and turning immediately on landing

• Physical examination findings include excessive abduction of the shoulder joint while the shoulder is fully extended. Pain is also present at the end of abduction

• Arthroscopic evaluation generally reveals a torn medial glenohumeral ligament and/or tear of the subscapularis tendon

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[Title]

- Mild cases treated with extracorporeal shockwave treatment and hobbles to prevent abduction, and rest for 4-8 weeks
- Alternatively, shoulder stabilization with a tightrope procedure or tissue anchors and suture, followed by hobbles placed for 4 weeks
- Rehabilitation begins slowly

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Fibrotic contracture of the infraspinatus muscle

- Commonly seen in active dogs following a period of strenuous activity
- May present with a mild weight-bearing lameness the day of injury, but over several days to weeks there is replacement of muscle fibers with fibrous tissue resulting in contracture, limiting normal ROM
- Hold the distal extremity in abduction, tend to paddle the leg when they walk, and are unable to fully extend the scapulohumeral joint

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[Title]

- If identified very early, physical rehabilitation may possibly prevent it
- Not commonly performed because surgery is so successful
- Ultrasound coupled with stretching exercises may help, but contracture usually so severe that the shoulder is maintained in abduction almost 100% of the time

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- Surgery involves transecting fibrous tissue and muscle
- Postop, allow full weight bearing as soon as possible
- Gentle, pain-free PROM exercises to the joints several times daily
- Excessive activity avoided to prevent tissue damage and recurrence
- General conditioning exercises used to gradually return muscles to normal size and strength

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Supraspinatus Tendinopathy/ Mineralization

- Mild to moderate lameness in medium and large breed dogs
- Point tenderness at the insertion of the supraspinatus on to the humeral greater tubercle
- Presence of mineralization can also be asymptomatic
- Mineralization on radiographs
- Medical treatment includes rest, NSAIDs, cryotherapy, and PROM, and extracorporeal shockwave treatment
- Surgical excision of mineralized tissue may be performed
 - Carpal flexion bandage for 2 weeks, activity limited for another 2 to 3 weeks

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8. Iliopsoas strain

- Increasingly recognized in dogs with coxofemoral joint pain not related to osteoarthritis
- May have a mild lameness
- May not be painful simple flexion and extension of the hip, but when hip is extended with simultaneous internal or external rotation of the hip, or if pressure is applied to the insertion of the iliopsoas tendon on the lesser trochanter, dogs are often extremely painful
- Ultrasound evaluation may indicate hemorrhage and fibrosis with loss of normal muscle architecture

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Iliopsoas Maneuver



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- Conservative treatment may consist of strict rest for 10 to 12 weeks, gentle stretching and cross-frictional massage, nonsteroidal anti-inflammatory drugs, and cryotherapy
- In many mild cases, conservative treatment will be effective
- In more severe cases, the tendon of insertion may be transected and pain relief is often dramatic

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#9. Osteochondritis dissecans, panosteitis

- OC is abnormal endochondral ossification of the deep layers of articular cartilage in medium and large breeds, resulting in focal areas of thickened cartilage that are prone to injury
- In the absence of excessive stress, the lesion may heal
- However, stress on the cartilage may result in a cartilage flap, a condition termed osteochondritis dissecans (OCD)
- OCD described in various joints, but occurs most commonly in the shoulder

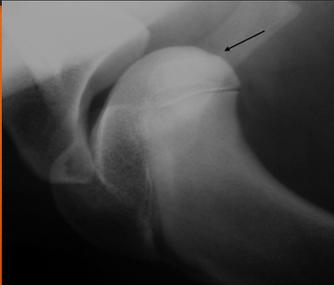
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OCD

- Mild to moderate lameness between 4 and 9 months of age
- Atrophy of muscles if lame for several weeks
- Pain with flexion or extension of the joint
- Dogs with hock and elbow OCD may have signs of OA such as joint effusion, thickening of the periarticular soft tissues, decreased ROM and crepitus
- Radiographs may demonstrate a defect in the subchondral bone under the cartilage flap

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Common Site of OCD in the Forelimb



Shoulder OCD

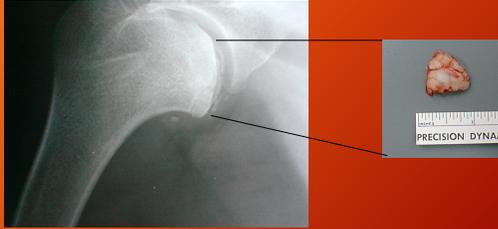
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OCD

- Surgery generally the treatment of choice if clinical signs
- Arthrotomy or arthroscopy to remove the defective cartilage and to forage or curettage the bed of the lesion to encourage formation of fibrocartilage
- NSAIDs, cryotherapy, PROM and controlled leash walks for the first 2 to 4 weeks
- Seroma common complication after shoulder surgery, but is usually self-limiting and resolves with rest
- Long-term management focused on limiting or treating OA

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Osteochondritis Dissecans



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- Long-term prognosis for shoulder OCD is excellent in most cases
- Prognosis for elbow OCD is good if surgery is performed before OA is advanced, but it is more guarded than for OCD of the shoulder
- Prognosis for stifle and hock OCD tends to be guarded, because OA usually progresses even after surgery

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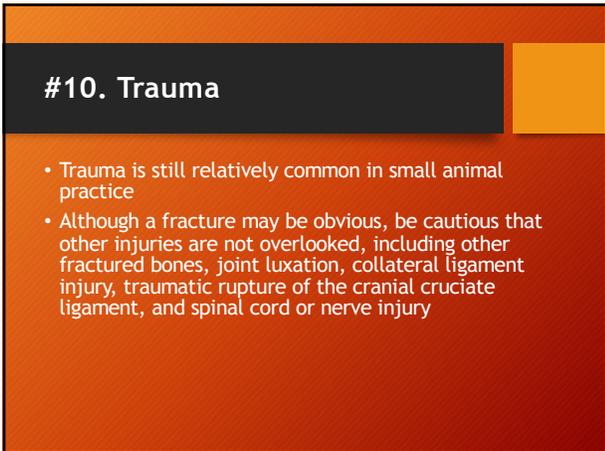
Panosteitis

- Should be considered in any young, large or giant breed dog with rapidly progressive lameness
- May have a shifting limb lameness, lethargy, and anorexia
- Clinical signs precede radiographic signs
- Pain on palpation of the midshaft of long bones, especially the ulna, radius, humerus, femur and tibia

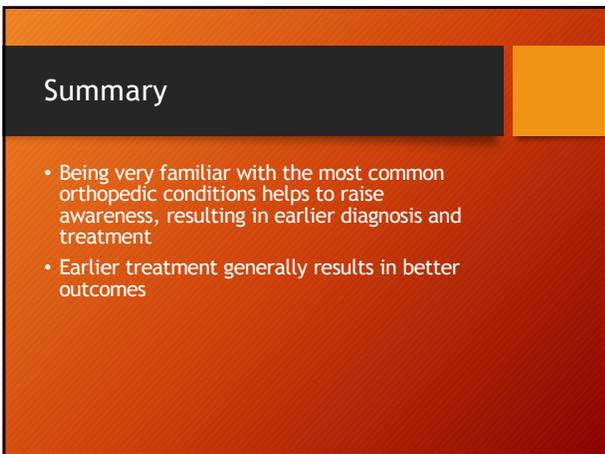
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