

## Avoiding the Surgeon: Preventing Stifle Disease



Bess J Pierce, DVM, DABVP, DACVM, DACVSMR  
Associate Professor of Practice, CPCVM  
VA-MD College of Veterinary Medicine  
Colonel, Veterinary Corps, US Army Reserve



## Best dogs in the world...



Photograph by Martin Schoeller for National Geographic



## The Stifle

- Prevalence of CCL has doubled in past 30 years
- 2005 JAVMA article reported the cost of treatment for CCL disease exceeded 1.2 billion dollars (Wilke et al. JAVMA 2005; 227(10):1604-1607)
- Current thoughts are shifting away from a disease of dysfunctional biomechanics

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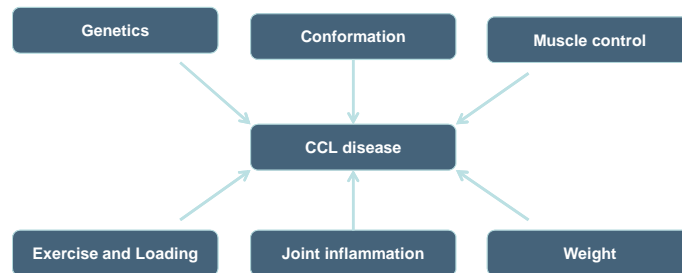
## The Stifle

- Trauma is primary cause of ACL injury in humans but accounts for only 20% of CCL injury in dogs
- 50% of dogs have bilateral disease
- Depending upon the technique of surgical correction, complication rates of 14-60% have been reported

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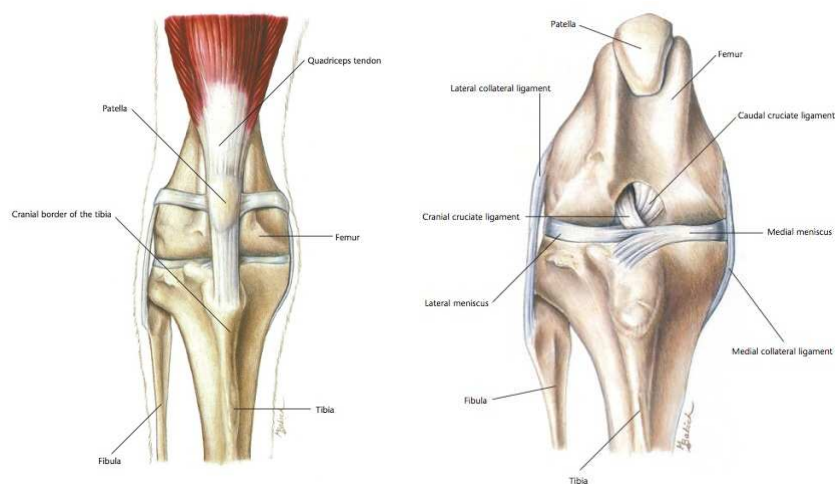
# The Stifle

- The “story” of CCL disease



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# Anatomy



from Hill's Atlas of Veterinary Clinical Anatomy

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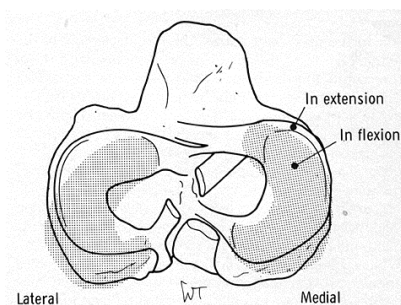
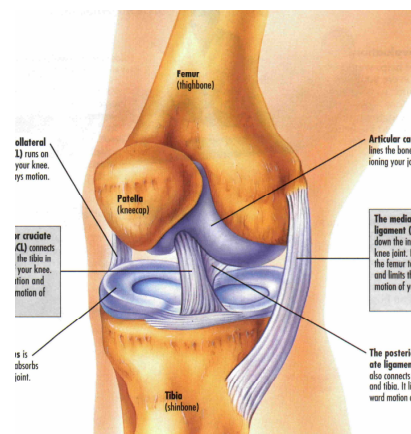
# Anatomy



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# Anatomy



**FIG. 80-4** Drawing of the dorsal aspect of the tibia illustrates the normal excursion of the menisci in extension and flexion (shaded). Note the limited movement of the medial meniscus. (Arnoczky SP, Torzilli PA, Marshall JL: Evaluation of anterior cruciate ligament repair in the dog. An analysis of the instant center of motion. J Am Anim Hosp Assoc 13:553-558, 1977)

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## Anatomy of the Stifle



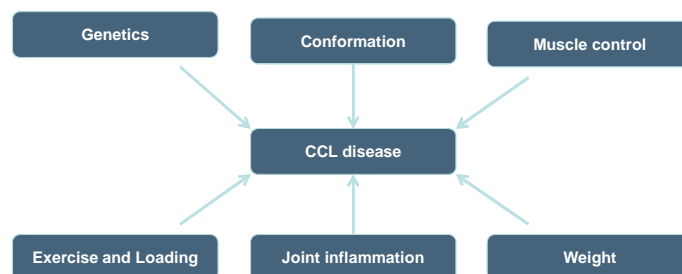
Video excerpt from Drs. Mellanby and Clements,  
University of Edinburgh



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## The Stifle

- The “players” in CCL disease



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## Genetics

- **Breeds at higher risk of CCL disease:**  
**Labradors, Rottweilers, Newfoundlands, Mastiff, Akita, Staffordshire Terrier, St. Bernard**
- **Newfoundlands –**
  - genetic satellite markers identified
  - 22% prevalence of CCL disease
  - 27% phenotypic expression attributed to genetics, and 73% linked to environmental factors.

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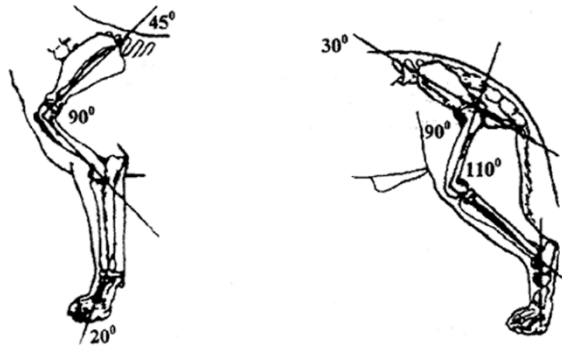
## Genetics

- **Breeds at lower risk of CCL disease:**  
**Greyhounds, Dachshund, Bassett Hound, Old English Sheepdog, German Shepherd Dog**

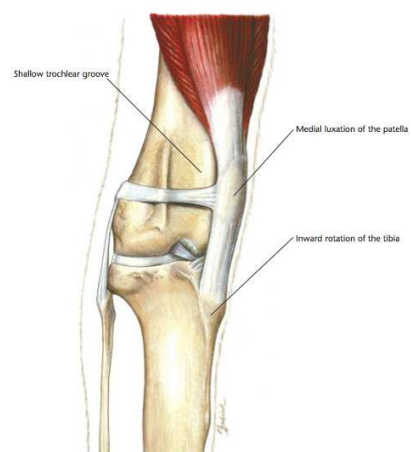


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## Conformation



## Conformation



from Hill's Atlas of Veterinary Clinical Anatomy



## Conformation

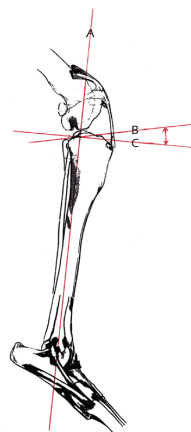


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## Conformation

- Excessive TPA
- Early neutering may contribute
- Breed variation
- Individual variation
- >30 degrees has been associated with CCL disease

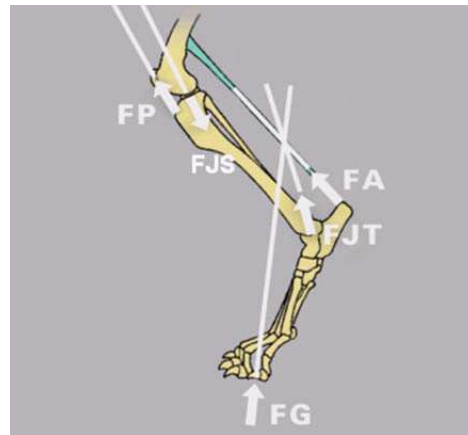


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## Muscle control



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## Muscle control



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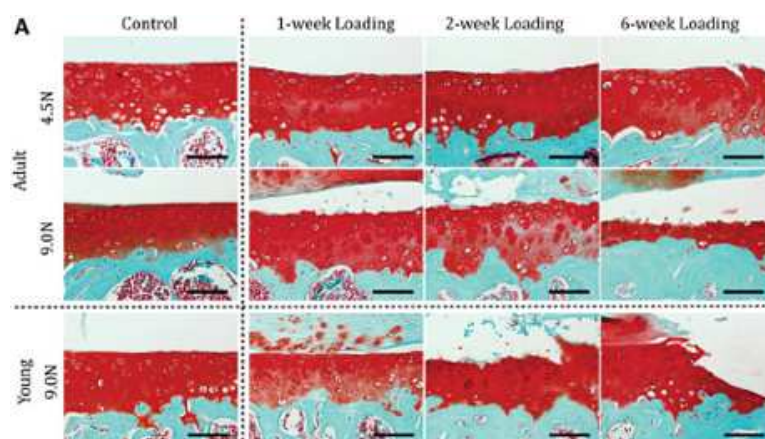
## Weight



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## Weight



Ko F, et. al., *Arthritis and Rheumatism* (Vol. 65 No. 6).

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## Exercise



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## Exercise

- Improves cardiovascular fitness
- Maintains body condition and provides weight control
- Regulates biochemical/hormonal functions
- Improves/maintains bone and joint structure and function
- Decreases risk of cardiovascular disease, Type 2 diabetes, hypertension, certain cancers, obesity and depression

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## Joint inflammation and OA

- Diet – therapeutic joint diets
- Nutraceuticals - omega-3 FAs, chondroitin sulfate, glucosamine, GLME, hylauronate, MSM
- Pharmaceuticals – NSAIDs, analgesics (tramadol), amantadine- NMDA antagonist
- Treatment modalities: physical rehabilitation, low level laser, therapeutic ultrasound, manual therapy, acupuncture

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## Joint inflammation and OA

- Joint injections –
  - stem cell therapy, platelet rich plasma (PRP), autologous conditioned serum
  - hyaluronic acid, corticosteroids



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## Putting it all together...



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## Putting it all together...

- Maintaining appropriate growth rates and BCS through all life stages
- Spaying or neutering canine patients after 6 months (or older)



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## Putting it all together...

- Promoting physical conditioning, proprioceptive training and targeted muscle strengthening



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## Putting it all together...

- Early intervention and vigorous management of inflammation throughout the body
  - Osteoarthritis
  - Periodontal disease
  - Ideal body condition score

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**Questions? [bpierce@vt.edu](mailto:bpierce@vt.edu)**

