Developmental Orthopedic Disease - (DOD)

- What is it?
- How do they get it?
- How do I evaluate/diagnose it?
- How should it be treated?
- What should I expect with treatment?
- Why treat it?

DOD

- Flexural Deformities
- Osteochondrosis (OCD)
  - flaps (dissecans)
  - subchondral cysts
- Physitis
- Angular Deformities
- Wobblers
- Brachygnathism

Why treat it?
Normal bone growth
- “Endochondral Ossification”
- Cartilage leads the way
- Maturation and differentiation from cartilage to bone

Foals are
- Growth influenced by:
  - nutrition
  - amount of weight bearing
  - our intervention
    - surgical

Treat the foal - Not just the problem
- Stabilization / support
- Exercise
- Medications
- Nutrition
- “Soft” vs. “Hard” tissue
Angular Deformities

- "Crooked" Foal
- Limb distal to the joint
  - valgus or varus
- Carpus/Tarsus and fetlock

Growth vs. Deformity

Varus  Valgus
Angular Deformities

- Asymmetric physeal growth

Angular Deformities

- Periarticular laxity

Angular Deformities

- Delayed/irregular ossification of cuboidal bones
Angular Deformities
- Delayed/irregular ossification of cuboidal bones

Angular Deformities
- Excessive weight bearing
What is normal?
- Toe out
- Carpal valgus

Early recognition is critical
- Site of deformity
- Degree of deformity
- Potential for correction
  - shaping remaining growth

Determinants for our intervention
- Physical examination
  - Which joint, severity, precipitating cause
- Duration and Progression
- Previous “management”
  - Exercise, nutrition, any treatment
- +/- Radiographs
Expectations for the carpus

- Some valgus
- 5-7 degrees by 4 mths
- <2 degrees by 8-10 mths
- Most rapid growth < 6 mths of age

Fetlock deformities

- Often undiagnosed
- Varus; left rear most common
- Rapid growth < 3 mths

Treatment options

- Conservative management
Treatment options

- External coaptation
  - Too much is BAD

Treatment options

- Limited External Coaptation

Treatment options

- Limited External Coaptation
Treatment options

- Conservative management
- External coaptation
- *Surgical intervention*

Surgical options

- Periosteal transection
- Transphyseal bridging
- Step osteotomy

Periosteal Transection
Advantages of early periosteal transection

- Minimal risk
- No overcorrection
- Decreased cost
- 6-8 weeks of effect

Periosteal Transection

Transphyseal bridging

- Can overcorrect
- Requires 2nd removal procedure
- Increased Cost
  - 1st procedure + removal procedure
- *But* quicker resolution
Transphyseal Bridging

Transphyseal Bridging

Transphyseal Bridging
Surgical limitations

- 15-20 degrees for the carpus
- 6-8 degrees for the fetlock

Step Osteotomy

Sagittal plane  
Frontal plane
Flexural Deformities
- Contracture
  - congenital
  - acquired
- Laxity
  - primarily congenital

Contracture
- Bone outgrows tendons
- Flexors overpower extensors
- Pain-myotactic reflex
- “Contracted Tendons”

Sites of Contracture
- Coffin joint - “Club Footed”
Sites of Contracture

- “Fetlock joint
  - “Posty”
  - “Upright”

Sites of Contracture

- “Carpus - “Over”

Determinants for our intervention

- Physical examination
  - which joint
  - severity
  - precipitating cause
Determinants for our intervention

- Duration and Progression
- Previous “management”
  - amount of exercise
  - nutritional
  - any treatment

Nonsurgical management

- Limited exercise

Nonsurgical management

- Oxytetracycline
- Bandaging/support/splinting
- Analgesics
Nonsurgical management

- Bandaging/support/splinting

Nonsurgical management

- Shoeing:
  - Toe extensions
  - Heel elevations

Surgical management

- “Check” ligament desmotomies
  - cut the tether to allow greater flexibility
- Tenotomies
  - cut the attachment
  - severe cases - breeding animal
“Club-Footed”
- < 4 mths of age
- Inferior check ligament desmotomy
- Shoeing with sx
  * toe extension

“Posty”
- 8-18 mths of age
- Superior and inferior desmotomy
- Shoeing?
Flexor laxity

- Coffin joint
- Fetlock

Flexor laxity

- Less is better

Flexor laxity

- Controlled exercise
Flexor laxity
- Shoeing
**Musculoskeletal Exam**

- Palpation - often in recumbency
  - Heat
  - Pain
  - Swelling
  - Range of motion

- Observe at a walk / trot
  - More evident than adults
  - Sequential evaluations

- Radiographs
- Ultrasound
Critical to alleviate lameness as quickly as possible

- Angular / Flexural deformities can have a more significant effect than the primary problem

Sepsis

- Multiple joints or physes
  - Cultures
  - “Squeeze the bone”
- Source
- Often insidious onset
- Difficulty in interpreting radiographs