

Neuromotor development in puppies: What does it mean for athletic training and conditioning?

Date: 3 September 2019

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The debate...

- How much and what kind of physical/fitness training should puppies perform?
- What do we expect to gain from dedicated fitness programs in puppies:
 - Improved performance: olfaction, problem solving, strength, endurance?
 - Improved health status: longevity, increased disease-free intervals?

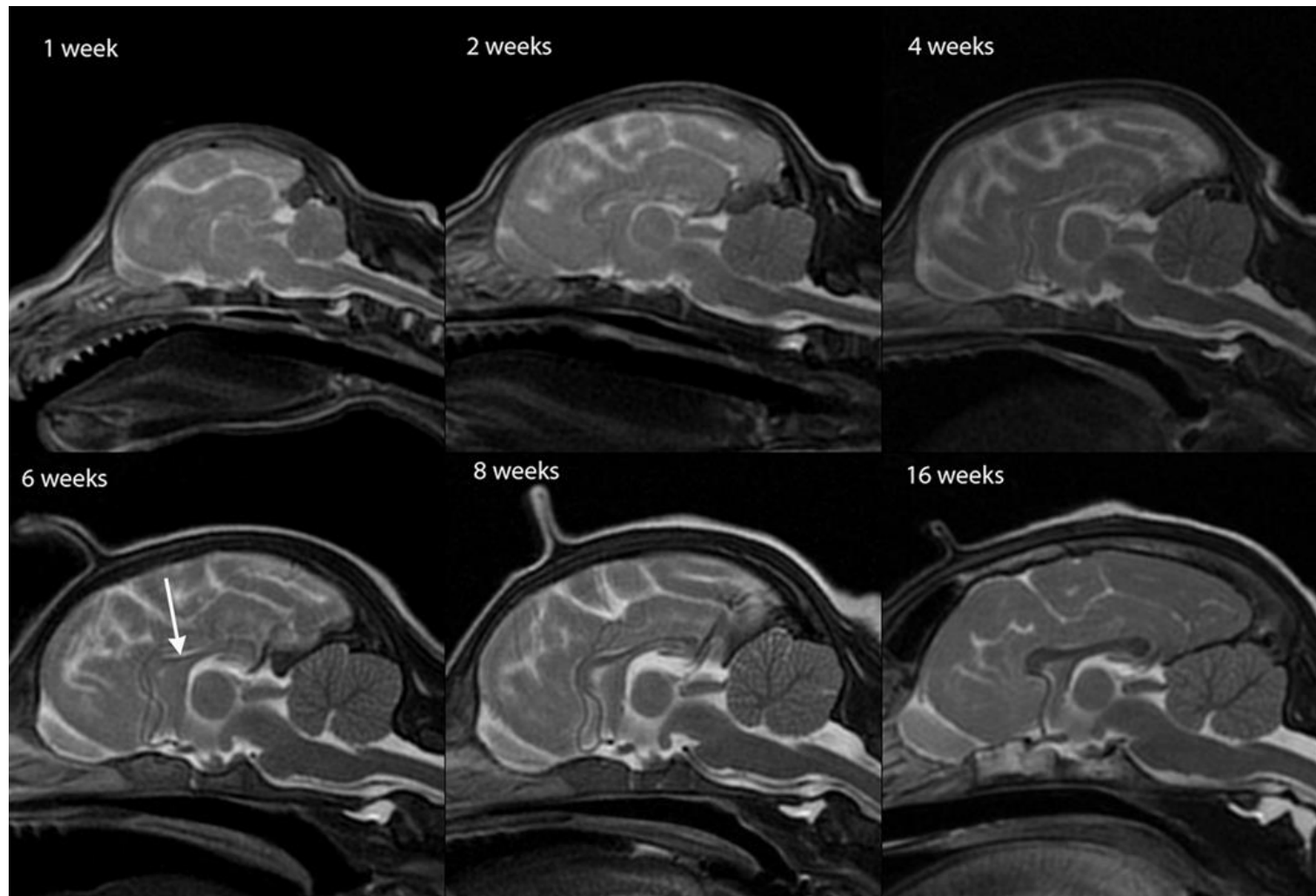


Puppy brain development

- Puppy brain develops rapidly, with significant changes in physical appearance in the first 30 days of life
- By day 60, the germinal zone is replaced by normal central nervous system tissue
- Electroencephalogram (EEG) patterns become adult-like by 8 weeks of age
- At 6 months of age, the puppy brain weighs 96% of its adult weight



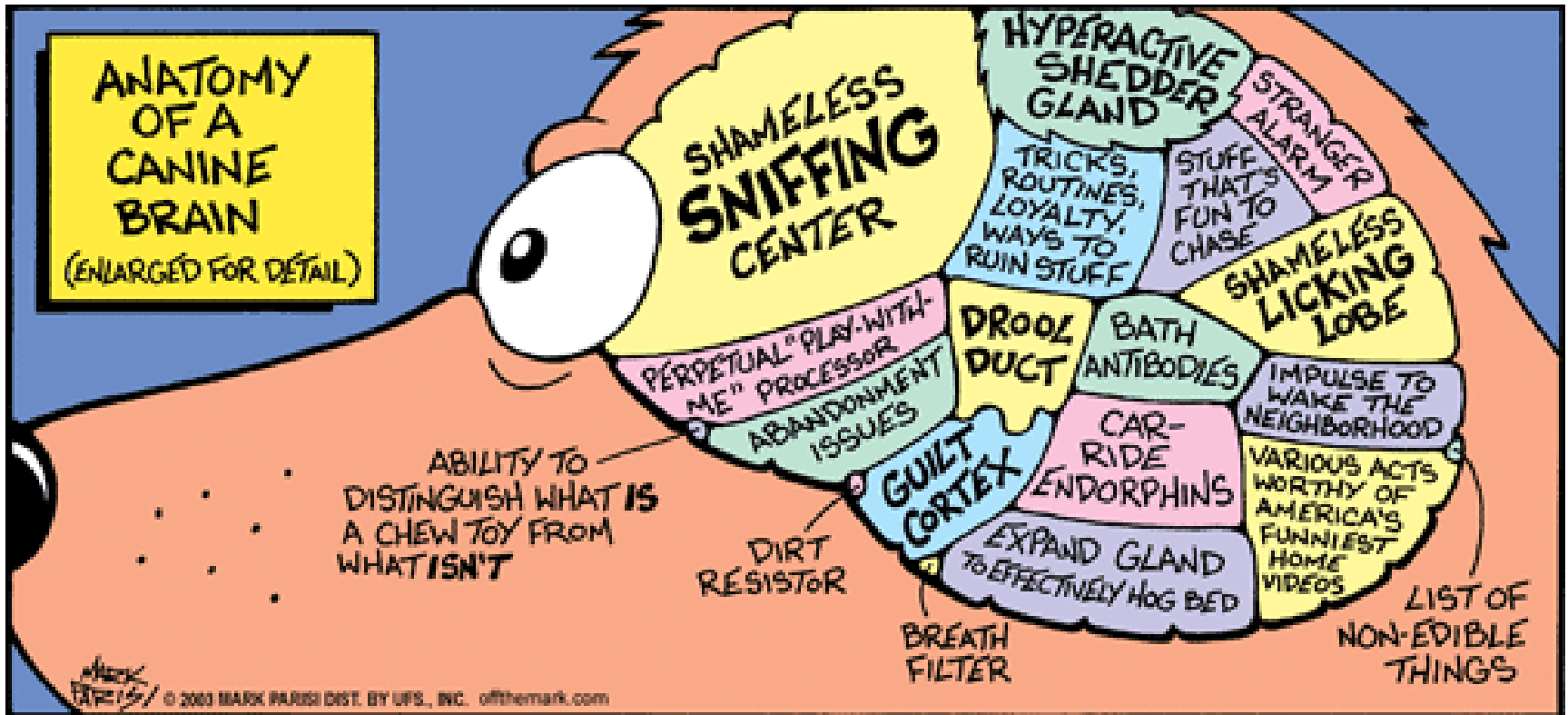
MRI - 1 week to 16 weeks of age



From *Vet Radiol Ultrasound*. 2010 Jul-Aug; 51(4): 361–373

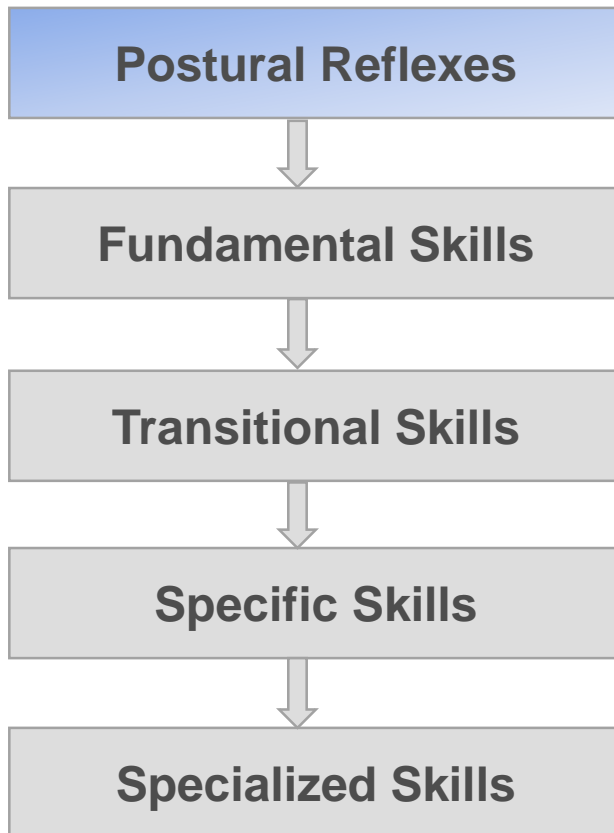
In other words...

Illustration by Mark Parisi, www.offthemark.com

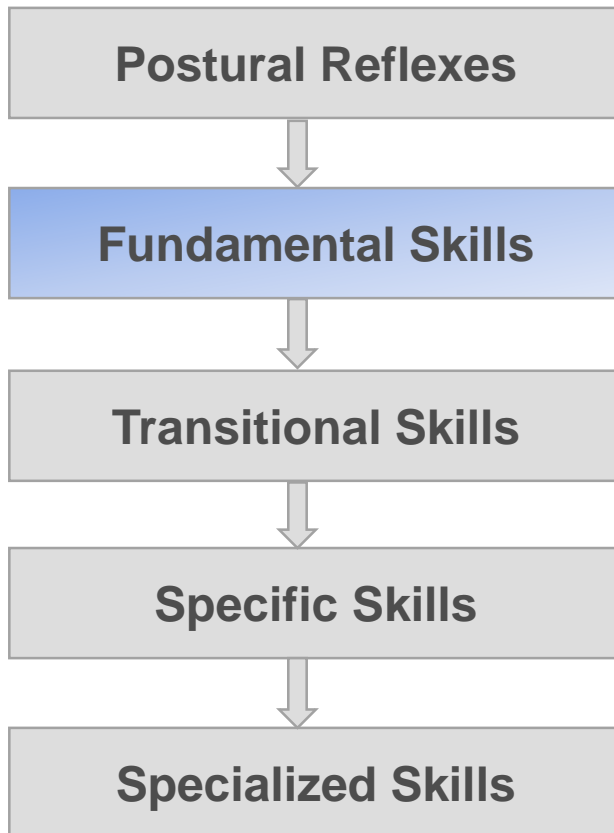


NEUROGENESIS!

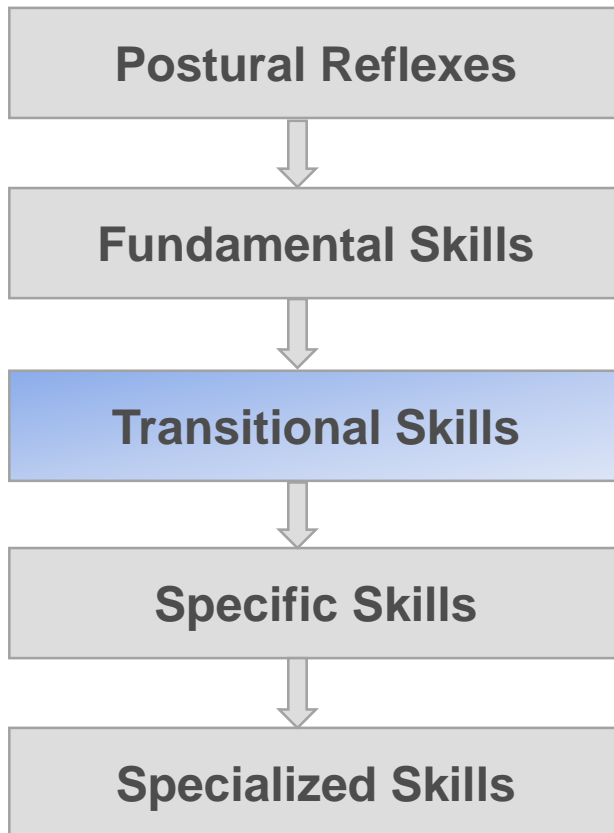
Neuromotor development



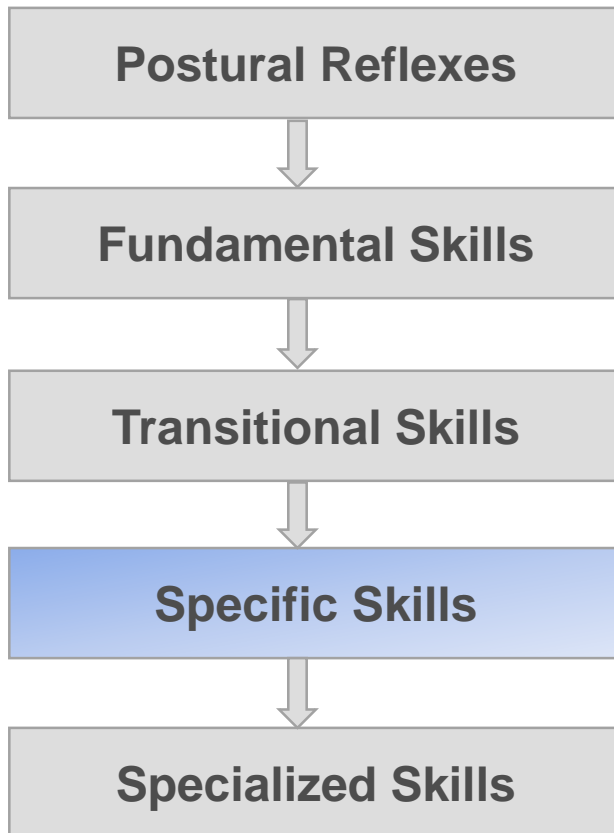
Neuromotor development



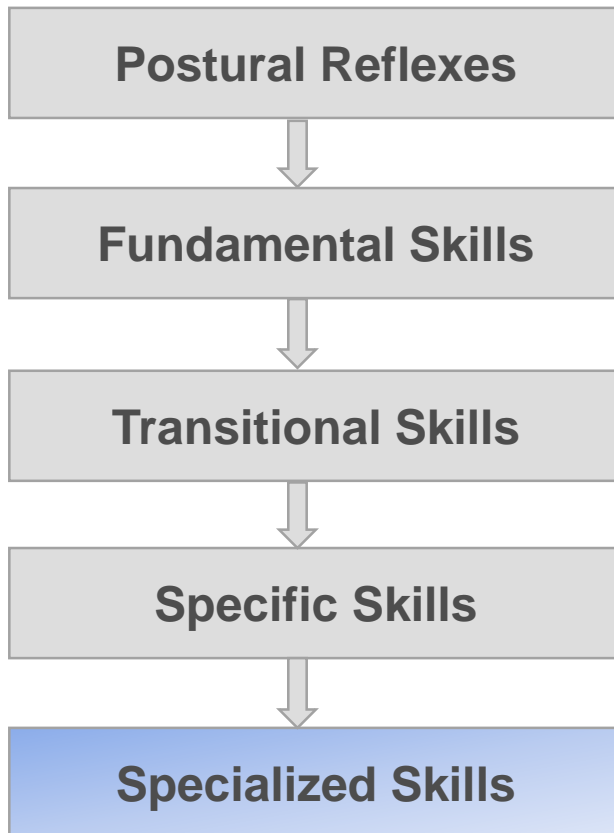
Neuromotor development

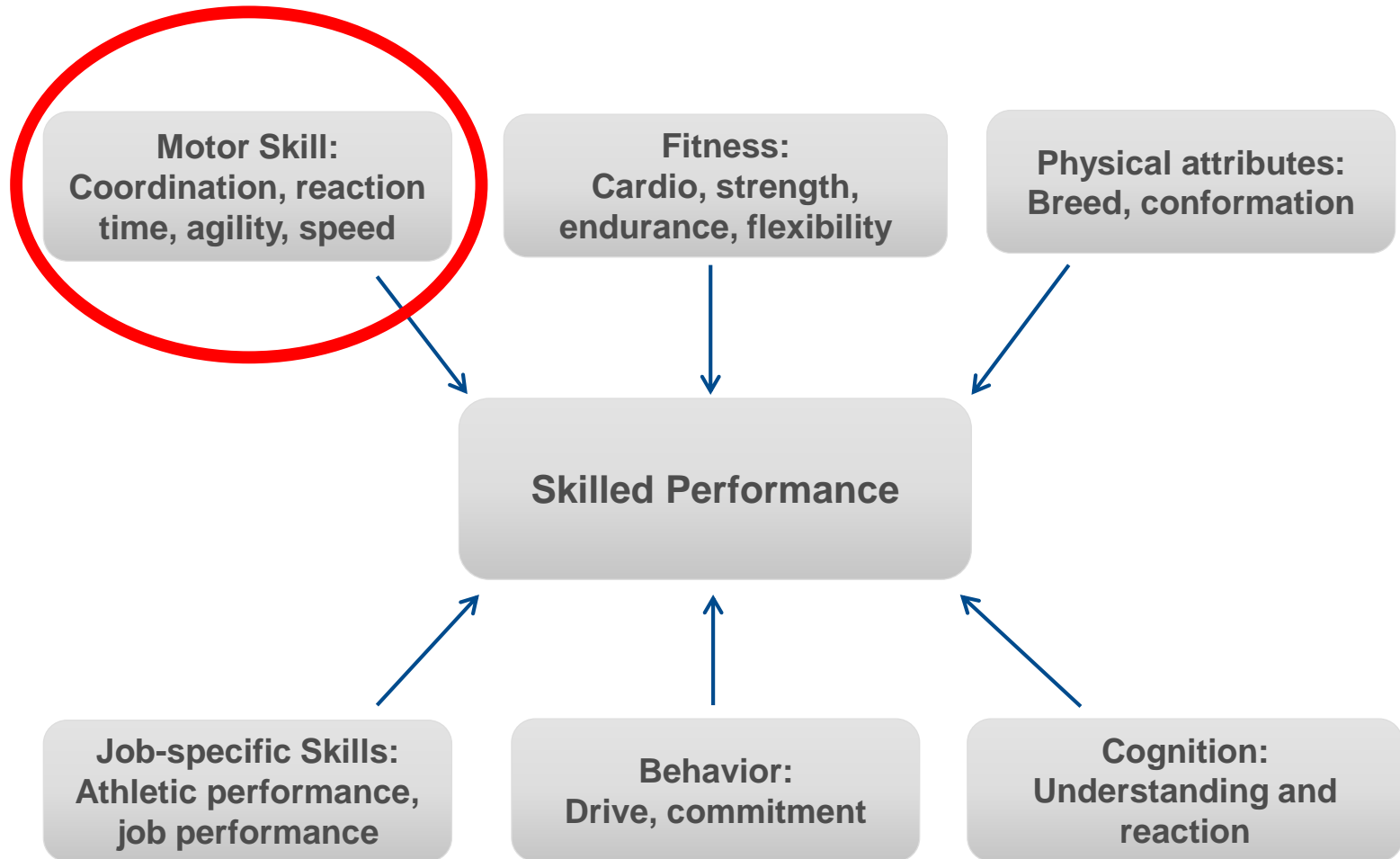


Neuromotor development



Neuromotor development

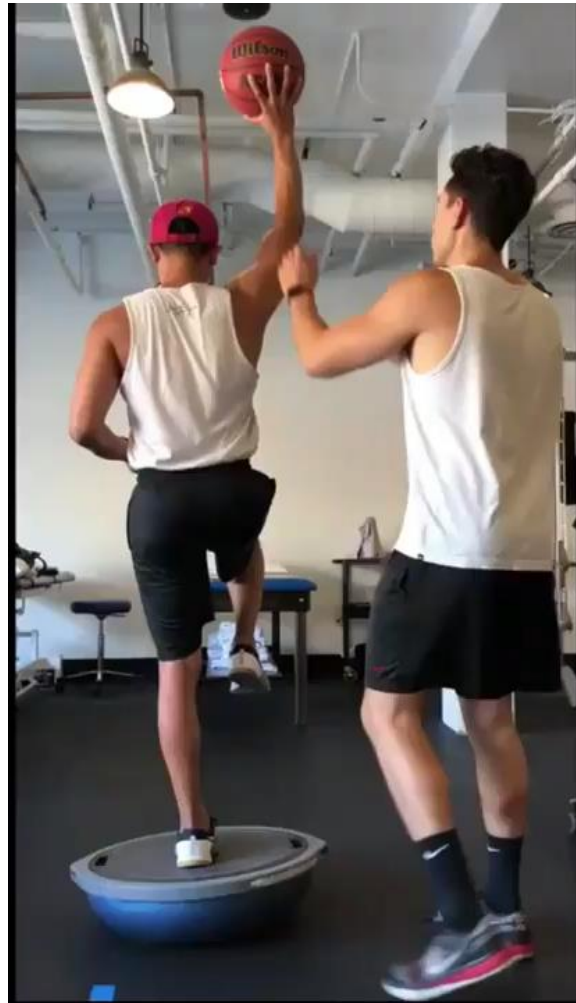




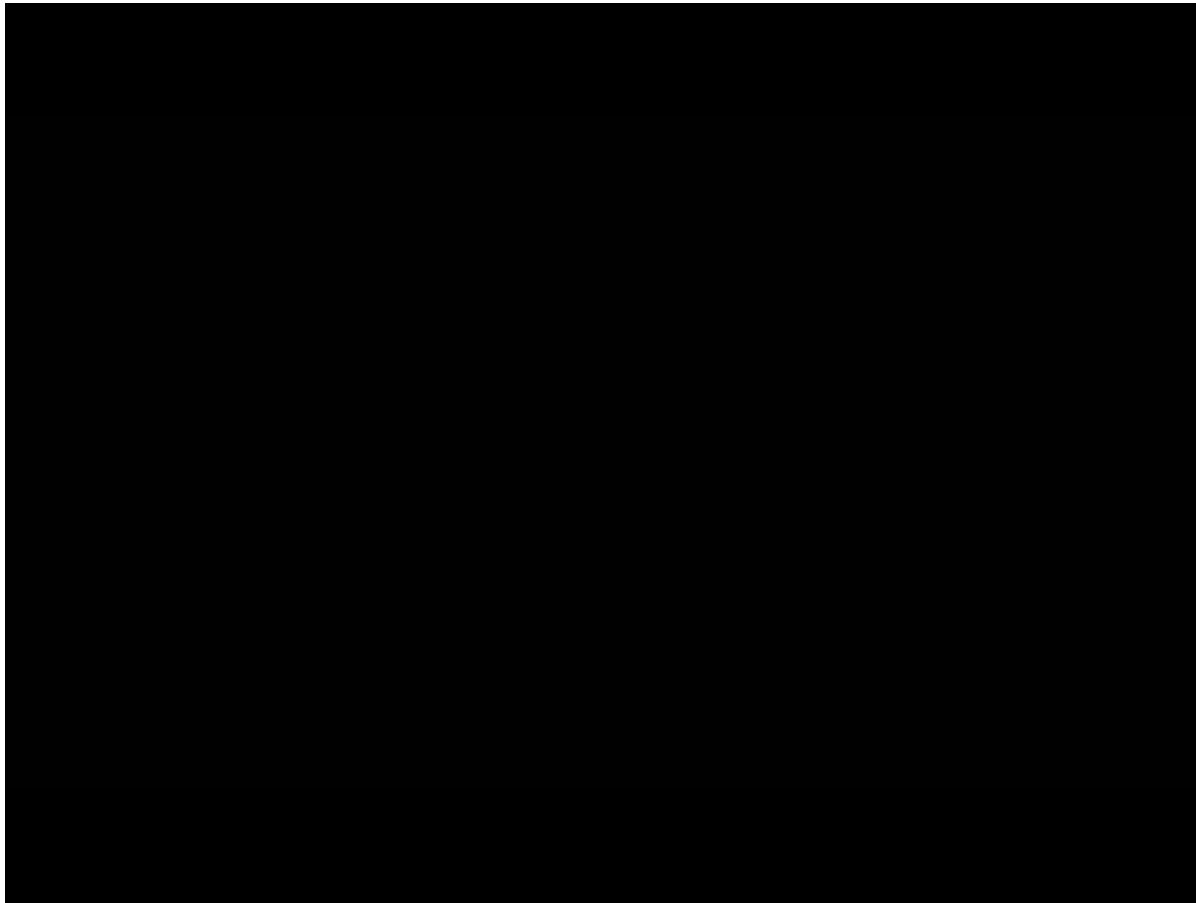
Neuromotor Training

- **Functional fitness training – critical for high level performance**
- **Balance, coordination, gait, agility, proprioceptive training**
- **Functional training and exercise in children and adolescents leads to continued improvement in development and sports performance, and decreases sports-associated injuries**





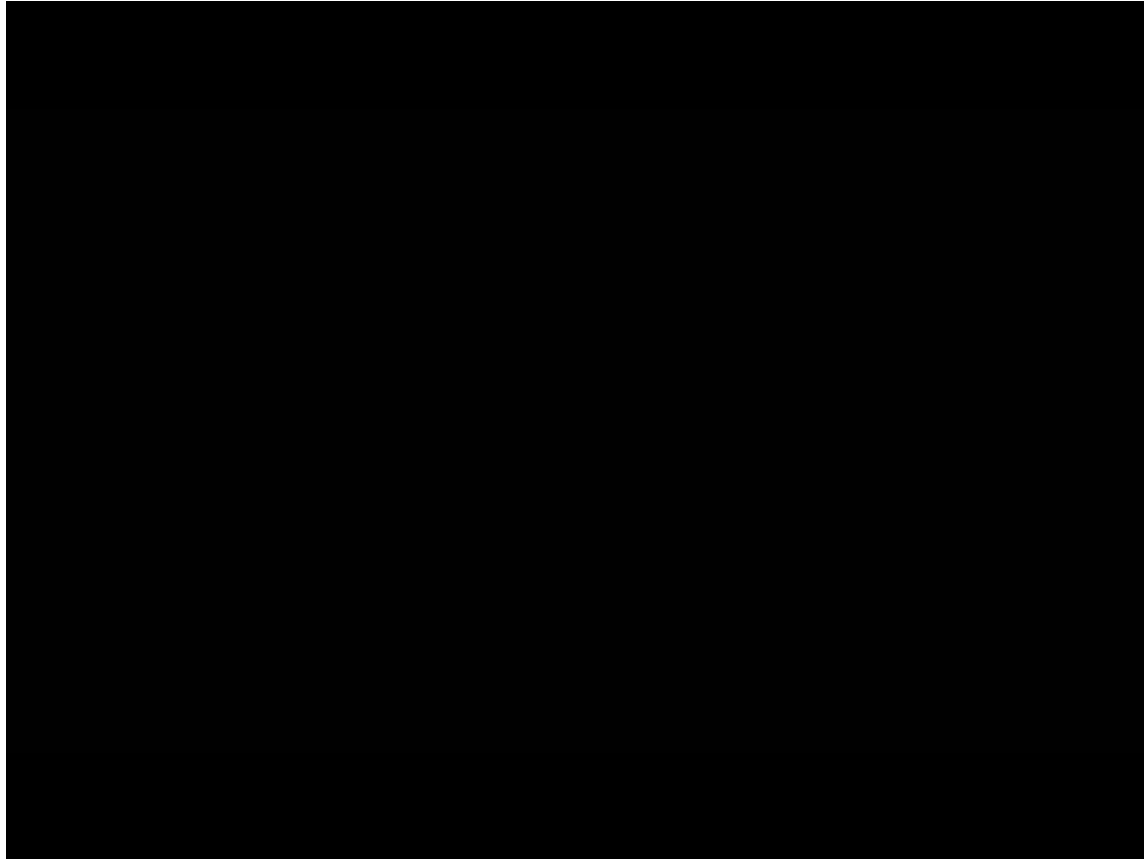
Functional fitness



Functional fitness



Functional fitness



Functional fitness



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