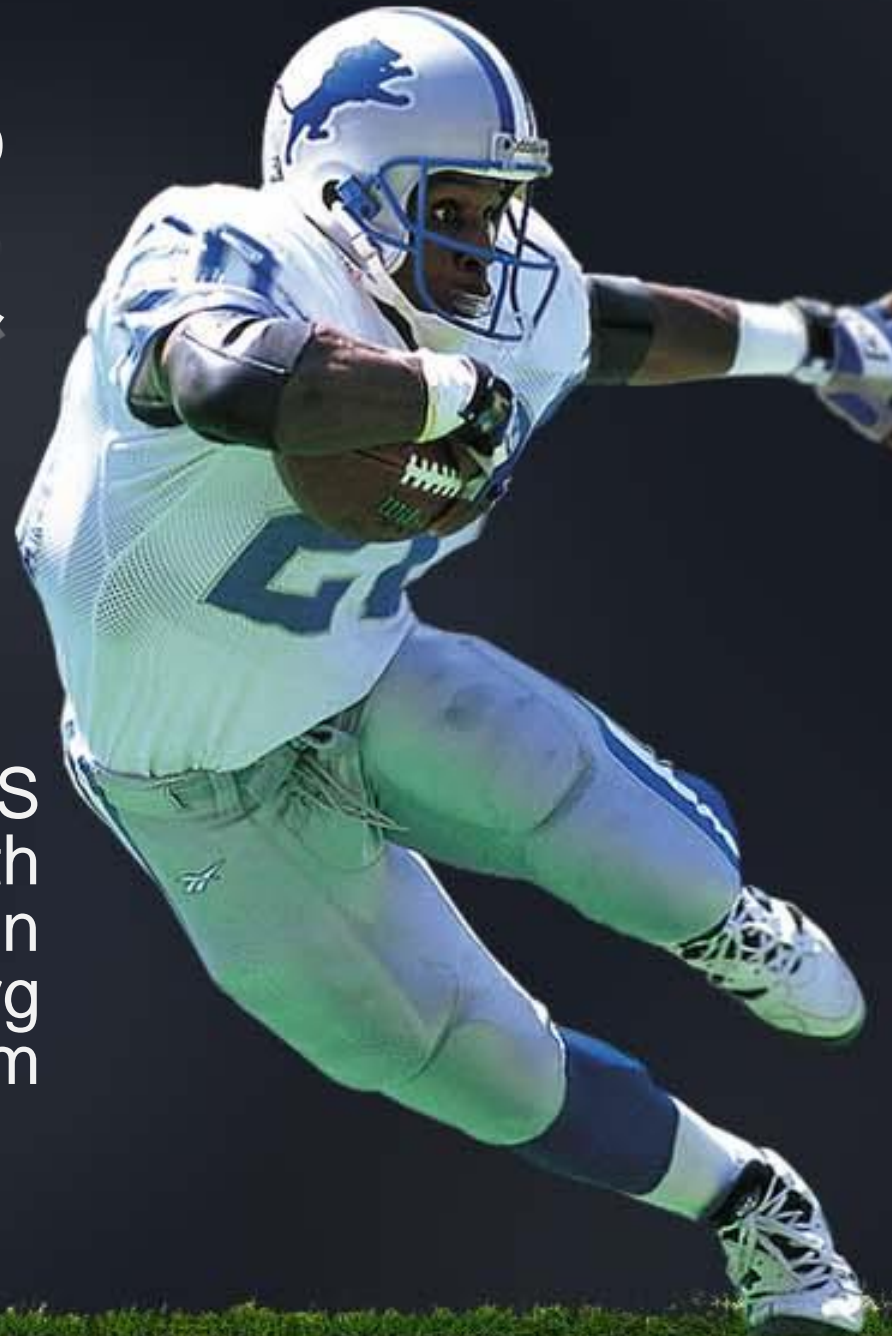


# HOW TO DEVELOP DYNAMIC SPEED & ACCELERATION

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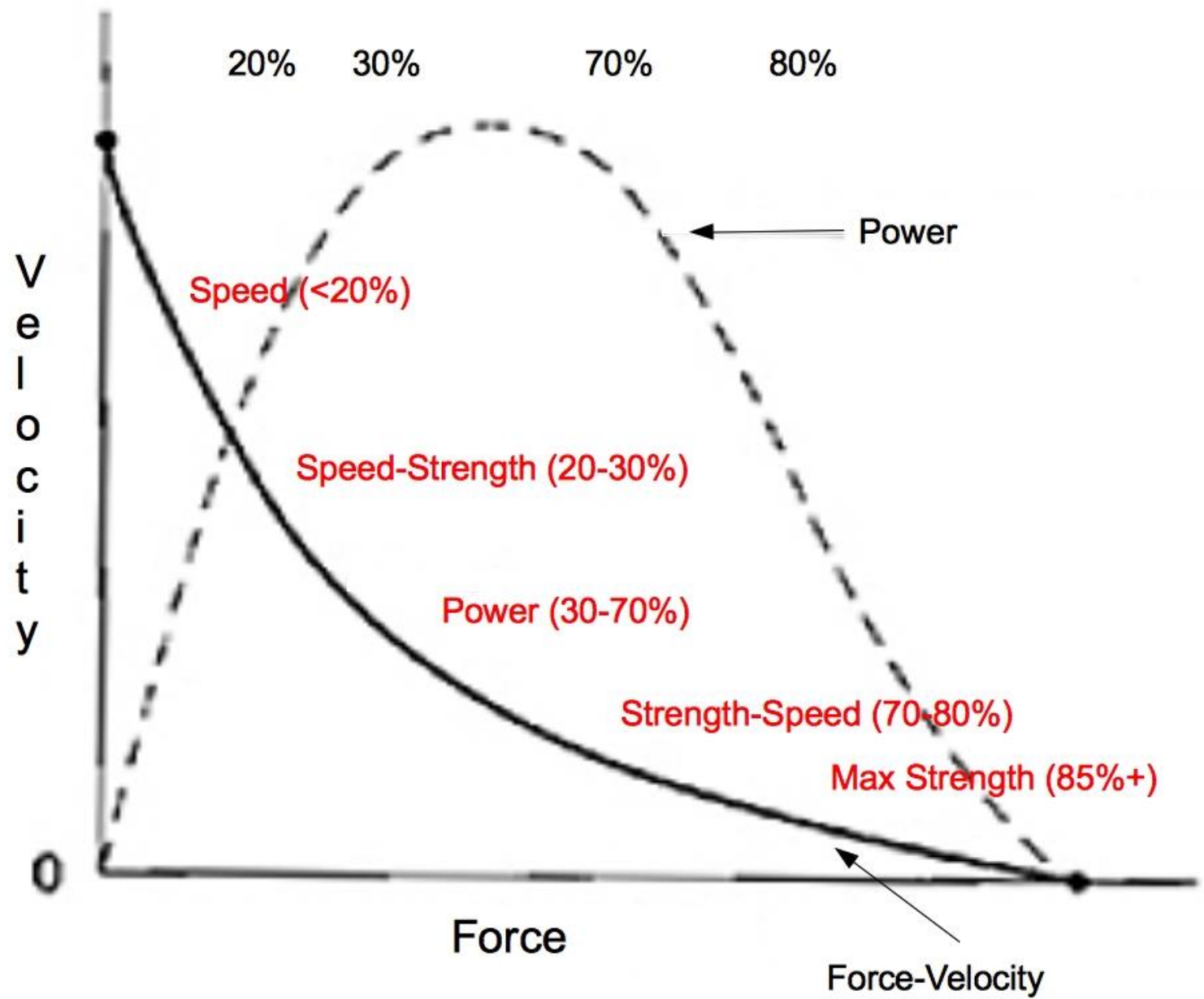


**Big Force**  
**+**  
**Minimal Time**  
**+**  
**Right Direction**  

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**Run Faster**

- \* Body Comp
- \* Sport-Specific Conditioning
- \* Sport-Specific Movements
- \* Stiffness
- \* Flexibility/Mobility



# Overload & Specificity



- Force = Strength Training
- Power = Plyometrics & Explosive Work
- Speed Strength – Weighted Movements
- Force Orientation – Mechanics/Technique
  - Possibly the most important....and most often ignored....trainable attribute.

# Speed Science

- JB Morin, et al (2011) – Definitively showed that force application technique and the orientation of the force were more important than the total amount of force applied. Horizontal force application was found to be correlated to sprinting speed, but vertical force and total force were NOT.
- Weyand, et al (2014) – Elite sprinters run differently and have a different force orientation than other runners. Ground contact time, leg speed and GRF are only about 30% greater for elite sprinters compared to normal people, but their speed is 80% greater.

# Creating Horizontal Power



- Great sprinters cover 1.5 meters on 1<sup>st</sup> step
- Foot height is only 12-30 centimeters on 1<sup>st</sup> step
- Ground contact time is .17 sec on 1<sup>st</sup> step compared to .08 sec at max velocity
- Push - Impulses

# What to Look For

- Forward Lean
- Knee Drive
- Positive Shin Angles
- Braking vs Propulsion
- Ankle Dorsiflexion
- Covering Ground



# Teaching Cues & Progression

- 1<sup>st</sup> step
  - Foot poppers
  - Wall drills
  - Starting stance
  - Push, not step
- 2<sup>nd</sup> step
  - Wait to finish the first
  - Drive knee forward
  - Push backward





# Weighted Sleds

- **15-20% BW**
  - Shown to improve acceleration speed (Alcaraz, et al, Harrison, et al, West et al, Cottle et al, Bolger et al)
- **45-50% BW**
  - Shown to improve horizontal force strategies (Kawamori, et al)
- **Short distances**
- **Long rest periods**



# Improve Neural Efficiency

- **Train acceleration early in the workout**
- **Focus on quality**
- **Short distances**
- **Long rest periods**
- **Lots of feedback**
- **Start young**
- **Include football movements**





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