

# **Drive Faster: Fitness Training for Your Senses**



# **Webinar**

**April 21, 2020**

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## **Introduction: Trey Shannon**

- Podium Performance Fitness in Cornelius, NC
- Certified Strength and Conditioning Specialist, Head and Neck Training Specialist
- Training Drivers in IMSA, WEC, NASCAR, EuroNASCAR, AER, TransAm, and karts since 2014
- Karting since 2000
- Completed seven 24-hour kart races as solo driver

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# What We'll Cover...

1. Balance & Why It's Important
2. Vision Training
3. Proprioceptive System and Feel
4. Vestibular System & Equilibrium
5. Q&A



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SPEED SECRETS

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# The Balance System

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# The Balance System

- Made up of three internal systems working together
  - Visual
  - Proprioceptive
  - Vestibular



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**SPEED SECRETS**

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# The Balance System

- Made up of three internal systems working together
  - Elite drivers tend to be exceptional in all three
  - All three can be developed, just like physical strength/endurance or reaction time
  - All three can individually experience fatigue
    - Like cognitive function, it's important to train these areas under differing levels of fatigue

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# Vision Training



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# Vision Training

- If you have serious vision issues, you should consult an optometrist.
- Sports vision and sports vision therapy are part of a well-developed Sports Optometry specialty.
- You may be able to correct beyond 20/20 or “not needing glasses.”

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# Vision Training

- Convergence and Divergence
- Focus Shift
- Visual Acuity and Processing
- Peripheral Vision
  - Detailed Vision Zone
  - Extreme Side Vision

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# Vision Training

- Convergence
  - *The simultaneous inward movement of both eyes toward each other in an effort to maintain single binocular vision when viewing an object*

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# Vision Training

- Convergence
  - Accurately locating braking point, turn in, apex, corner exit
  - Accurately judging location of other cars on track, especially those getting closer to you



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# Vision Training

- Divergence
  - *The simultaneous outward movement of both eyes away from each other in an effort to maintain single binocular vision when viewing an object*

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# Vision Training

- Divergence
  - More relevant when shifting focus from near to far
  - Looking up track
  - Shifting focus from mirror/dash back to track



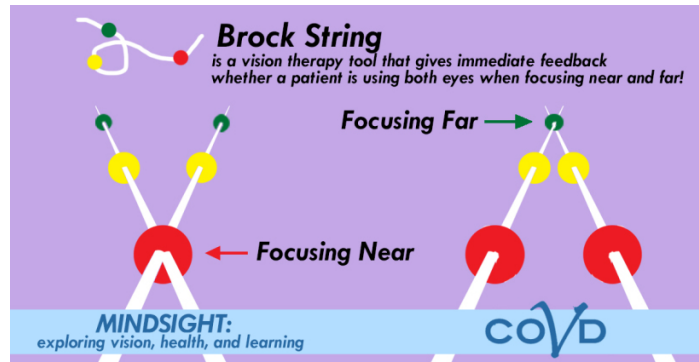
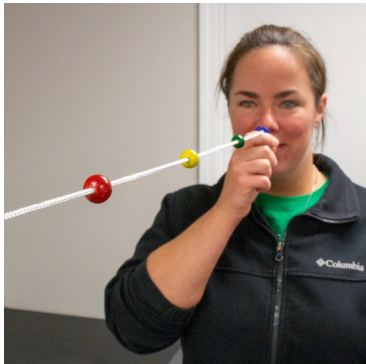
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# Vision Training

- Brock String Assessment and Training



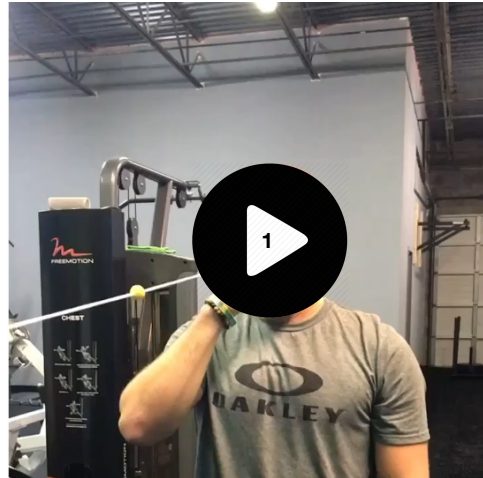
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# Vision Training

- Brock String Assessment & Training
  - Convergence
  - Divergence
  - Fixation Time



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# Vision Training

- What we look for in our assessments
  - Convergence Insufficiency
    - Suppression
  - Horizontal Alignment

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# Vision Training

- Convergence Insufficiency
- Suppression



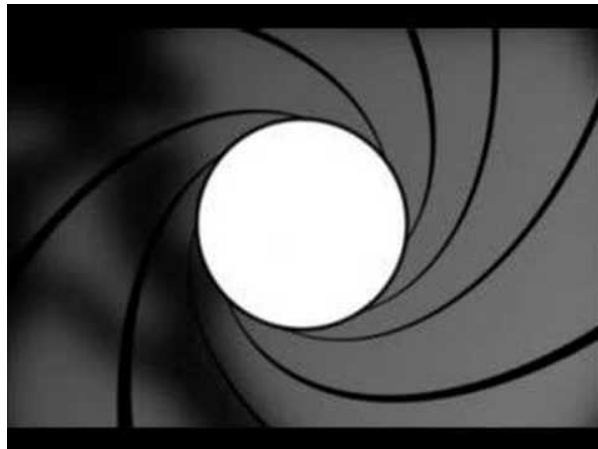
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# Vision Training

- Convergence Insufficiency
- Suppression
- Single Eye Drills



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# Vision Training

- Convergence Insufficiency
- Suppression
- Single Eye Drills



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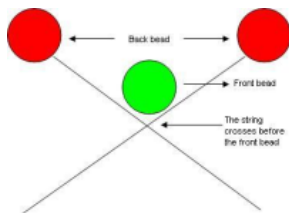
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# Vision Training

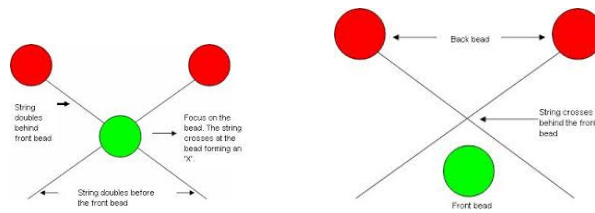
## Horizontal Alignment

- Perception of an object to be closer than reality
- Perception of an object to be farther than reality

### ○ String Crossing Before Bead



### ○ String Crossing After Bead



EyeQ Optometrists

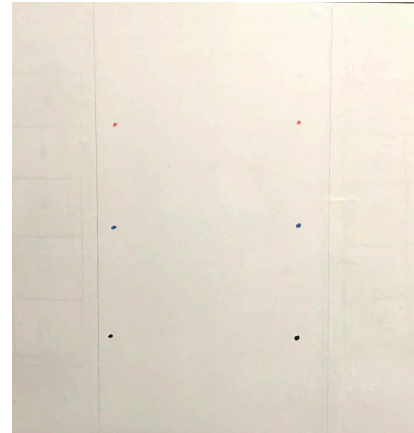
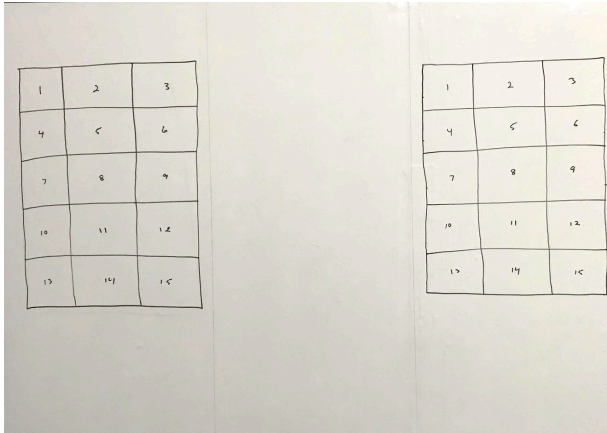
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# Vision Training

- o Focus Shift



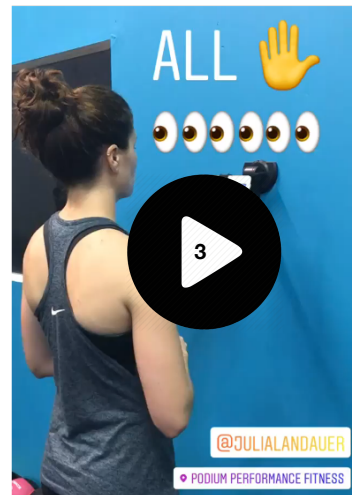
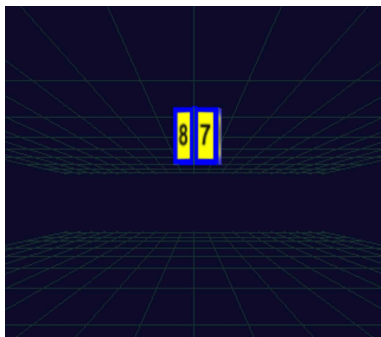
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# Vision Training

- o Visual Acuity and Processing
- o Kinetic Visual Acuity



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# Vision Training

- Visual Acuity and Processing
- Strobe Goggle Drills



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# Vision Training

- Peripheral Vision
  - Detailed Vision Zone
  - Extreme Side Vision

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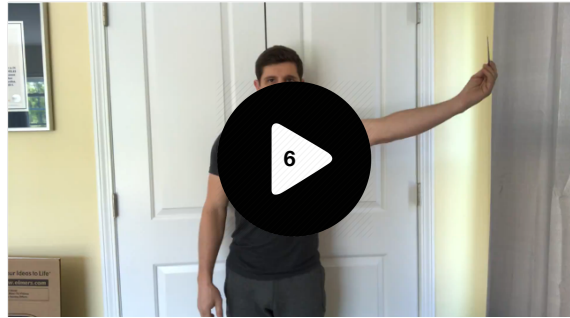


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# Vision Training

- Peripheral Vision
- Detailed Vision Zone



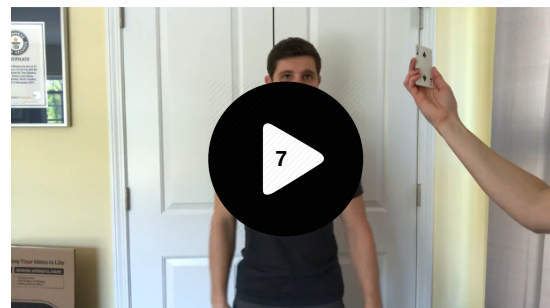
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# Vision Training

- Peripheral Vision
- Detailed Vision Zone Processing
- Progressions
  - Under Direct Stress
  - Stationary Bike
  - Treadmill



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# Vision Training

- Peripheral Vision
- Detailed Vision Zone Acuity
- IQ2

f	p	l	i	g
d	e	h	s	j
t	a	▶	r	n
o	w	q	v	b
c	x	m	k	u

5x5

s	q	e	r	d	f	u
f	y	e	d	r	t	i
a	n	c	a	f	p	j
p	g	t	▶	n	l	r
o	v	h	o	w	q	g
z	n	f	v	m	y	d
o	k	x	b	g	i	g

7x7

i	d	j	w	r	s	n	o	g
e	j	p	q	h	f	m	k	q
a	h	s	u	e	d	s	c	z
b	c	t	y	v	m	b	v	d
d	l	u	b	▶	e	i	f	g
o	n	f	n	t	m	f	r	g
e	j	s	l	w	b	t	h	k
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a	y	i	e	t	j	g	b	y

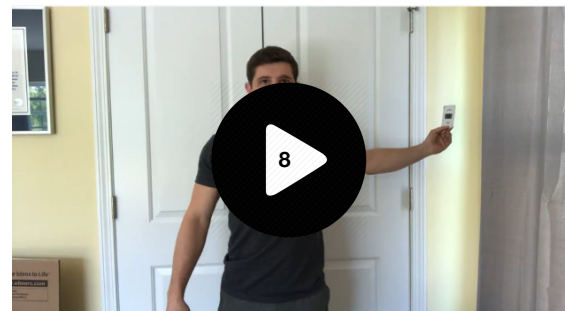
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# Vision Training

- Peripheral Vision
- Extreme Side Vision
  - Believed to shrink with misuse
  - Many athletes report that side vision shrinks with fatigue

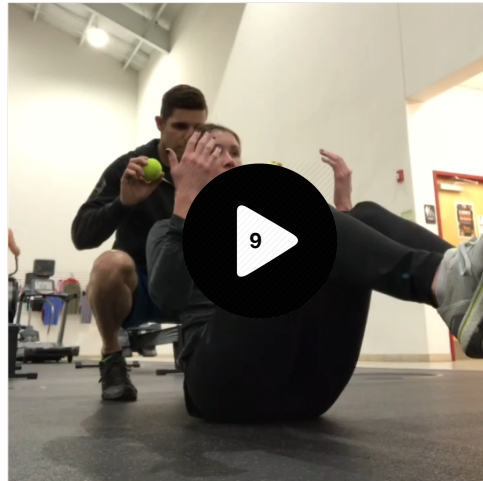


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# Vision Training

- Peripheral Vision
- Extreme Side Vision
- Direct Stress Progression



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# Vision Training

- Peripheral Vision
- Extreme Side Vision
- Active Hand-Eye Coordination



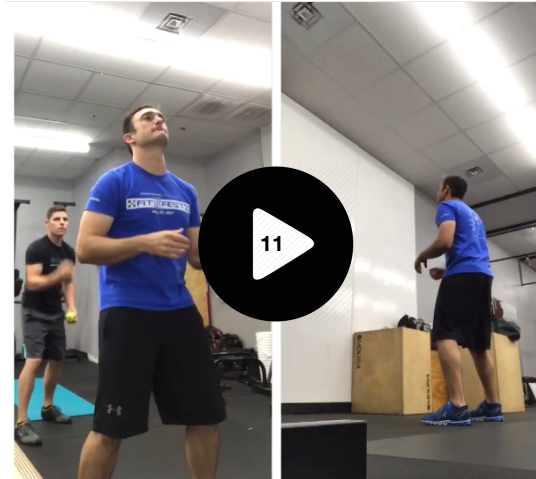
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# Vision Training

- Peripheral Vision
- Extreme Side Vision
- Active Hand-Eye Coordination x2



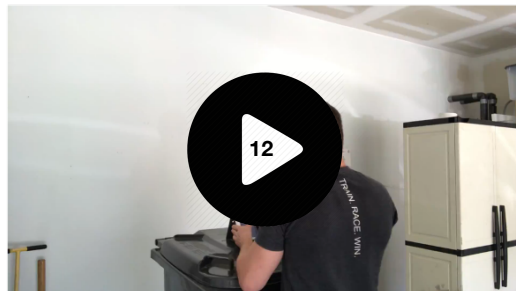
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# Vision Training

- Peripheral Vision
- Extreme Side Vision with Visual Acuity
- Peripheral Vision
- KineticVA with Rings



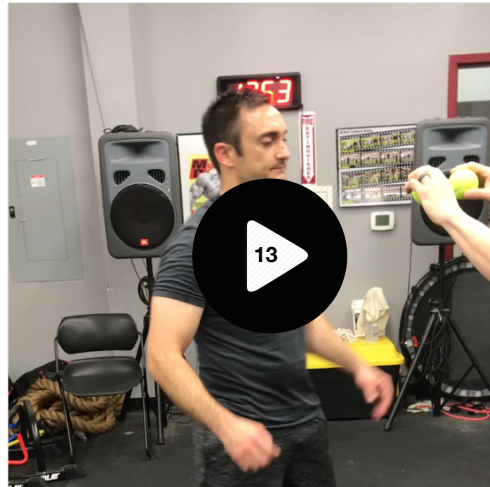
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# Vision Training

- Peripheral Vision
- Combine and transition between detailed vision zone and extreme side vision



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# Vision Training

- Peripheral Vision
- No partner, no problem



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# Proprioceptive System & Feel



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# Proprioception & Feel

- Proprioception
  - *The perception or awareness of the position and movement of the body*
  - Joint Kinesthetic Receptors provide information regarding the stretch of the joint capsule (angle) and ligament (length)
  - Muscle Spindles and Golgi Tendon Organs provide information regarding the changes in muscle tension

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# Proprioception & Feel

- Tells our brain how much force a motor unit is applying, rate of that force production, positioning of involved joints to create that force, and whether a change in that force is required
- Unless fine tuned, you may be applying above or below optimal force at above or below optimal rate, compared to what is perceived

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# Proprioception & Feel

- Shoes-Off Training
- Crawls
- Balance Board
- Catches + Throws



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# Proprioception & Feel

- Crawl Variations



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# Proprioception & Feel

- Crawl Variations



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# Proprioception & Feel

- Balance Board



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# Proprioception & Feel

- Catches + Throws



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# Proprioception & Feel

- Balance Board
- Catches + Throws



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# Vestibular System & Equilibrium

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# Vestibular System

- The **vestibular system** is a sensory **system** that is responsible for providing our brain with information about motion, head position, and spatial orientation; it also is involved with motor functions that allow us to keep our balance, stabilize our head and body during movement, and maintain posture
- Inner ear sensory system that provides the leading contribution to the sense of balance and spatial orientation for the purpose of coordinating movement with balance

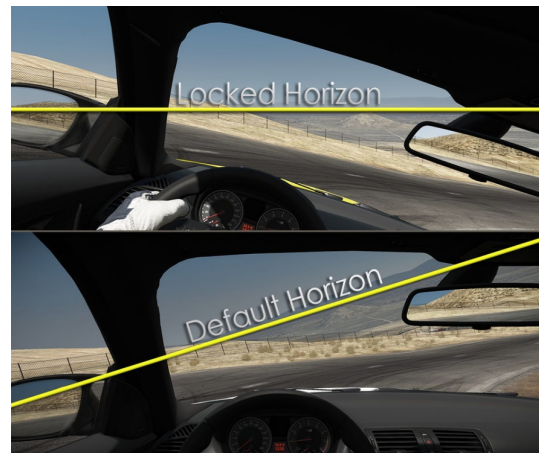
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# Vestibular System

- Our body's internal accelerometer & gyroscope



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# Vestibular System

- Eyes Closed Progression
  - Single Leg Progression
  - Movement Progression
- By removing the visual system, we overload the vestibular system

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# Vestibular System

- Eyes Closed Single Leg Progression
  - Stand
  - March
  - Suitcase Stand
  - Suitcase March
  - Perturbation
- Head Rotation
- Torso Rotation
- Deadlift (Head Rotation)
- Hop

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# Vestibular System

- Eyes Closed Single Leg Progression
- Stand



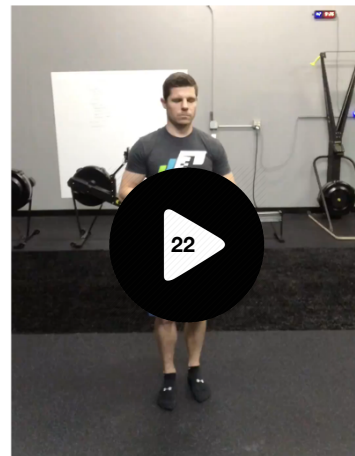
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# Vestibular System

- Eyes Closed Single Leg Progression
- March



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# Vestibular System

- Eyes Closed Single Leg Progression
- Suitcase Stand



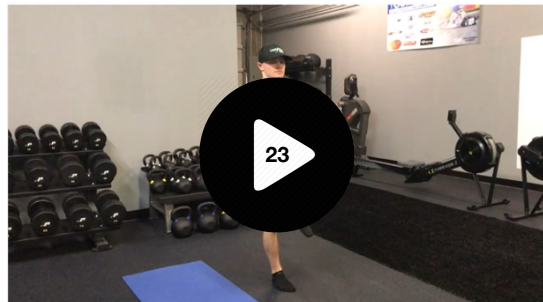
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# Vestibular System

- Eyes Closed Single Leg Progression
- Suitcase March



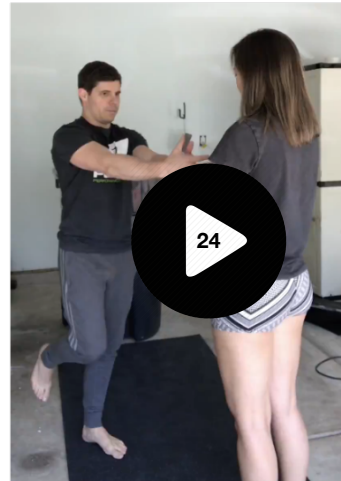
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# Vestibular System

- Eyes Closed Single Leg Progression
- Perturbation



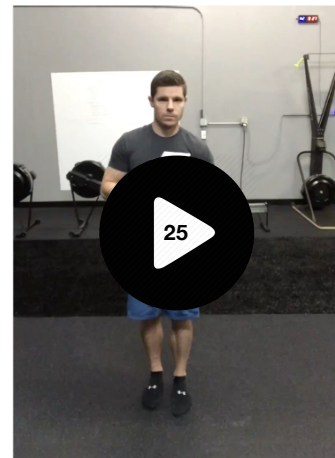
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# Vestibular System

- Eyes Closed Single Leg Progression
- Head Rotation



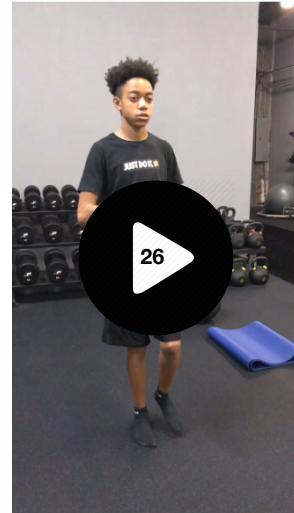
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# Vestibular System

- Eyes Closed Single Leg Progression
- Torso Rotation



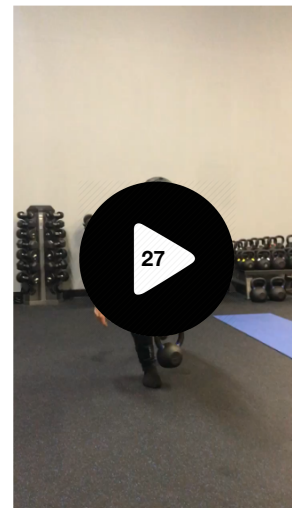
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# Vestibular System

- Eyes Closed Single Leg Progression
- Deadlift



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# Vestibular System

- Eyes Closed Single Leg Progression
- Deadlift Head Rotation



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# Vestibular System

- Eyes Closed Single Leg Progression
- Hop



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# Vestibular System

- Eyes Closed Movement Progression
  - Step Back Lunge
  - ¼ Turn Jump
  - Skater Hop
  - Double Skater Hop
  - Jump Shuffle
  - Tempo Skater Hop
  - Tempo Double Skater Hop

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# Vestibular System

- Eyes Closed Movement Progression
  - Step Back Lunge



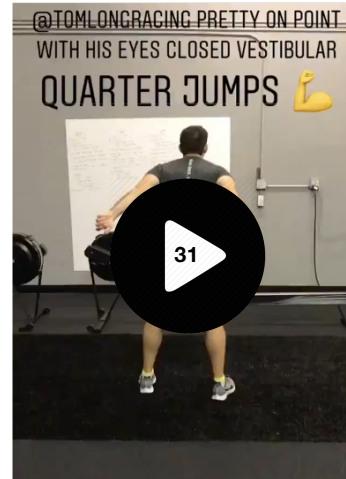
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# Vestibular System

- Eyes Closed Movement Progression
  - 1/4 Turn Jump



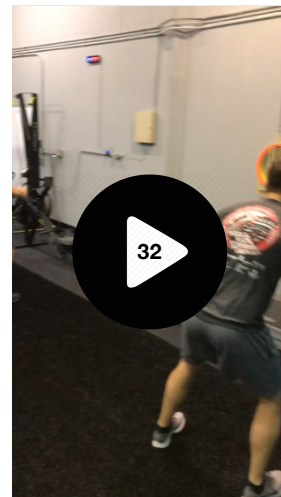
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# Vestibular System

- Eyes Closed Movement Progression
  - 1/4 Turn Jump



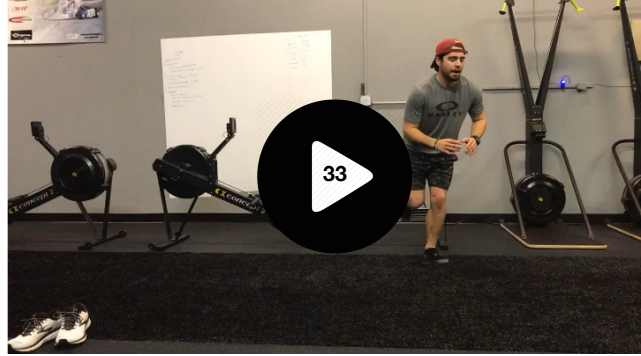
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# Vestibular System

- Eyes Closed Movement Progression
  - Skater Hop



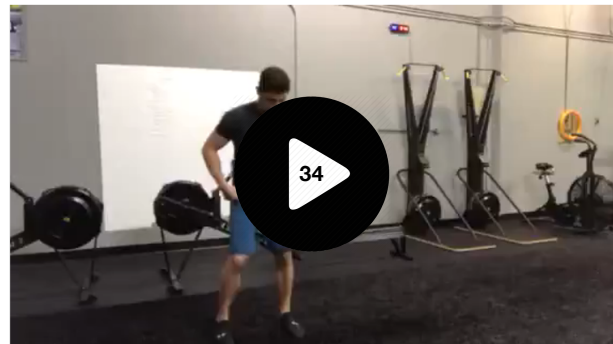
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# Vestibular System

- Eyes Closed Movement Progression
  - Double Skater Hop



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# Vestibular System

- Eyes Closed Movement Progression
  - Jump Shuffle



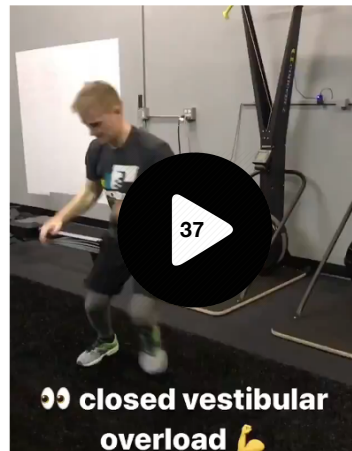
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# Vestibular System

- Eyes Closed Movement Progression
  - Tempo Skater Hop



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# Vestibular System

- Eyes Closed Movement Progression
  - Tempo Double Skater Hop

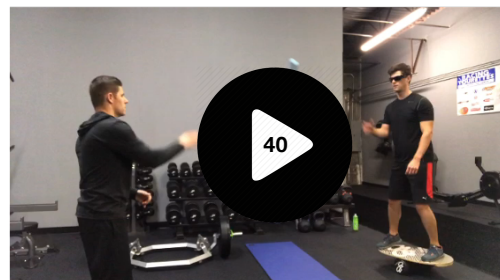
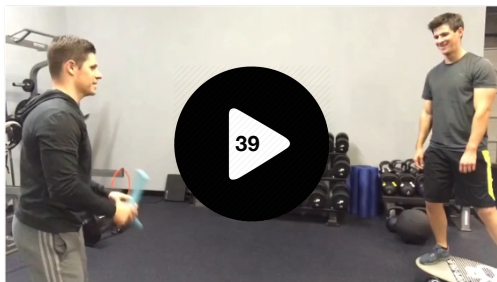


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# Combine It All!



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## Recap: Visual System

- Convergence & Divergence
- Focus Shift
- Visual Acuity & Processing
- Peripheral Vision
  - Detailed Vision Zone
  - Extreme Side Vision

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## Recap: Proprioceptive System

- Shoes Off Training
- Crawls
- Balance Board
- Catches + Throws

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## Recap: Vestibular System

- Eyes Closed Single Leg Progression
  - Stand
  - March
  - Suitcase Stand
  - Suitcase March
  - Perturbation
  - Head Rotation
  - Torso Rotation
  - Deadlift (Head Rotation)
  - Hop
- Eyes Closed Movement Progression
  - Step Back Lunge
  - ¼ Turn Jump
  - Skater Hop
  - Double Skater Hop
  - Jump Shuffle
  - Tempo Skater Hop
  - Tempo Double Skater Hop

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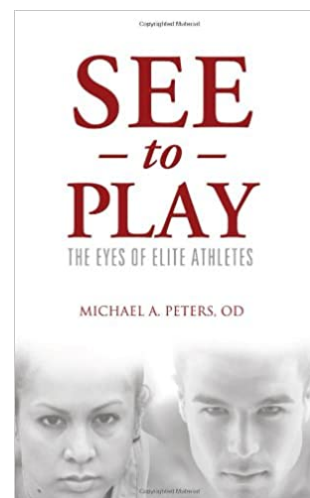


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## Suggested Reading

*See to Play – The Eyes of Elite Athletes*

- By Michael A Peters, OD
- Team Eye Doctor for NHL's Carolina Hurricanes



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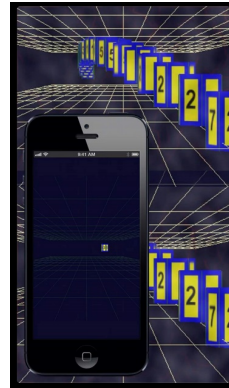
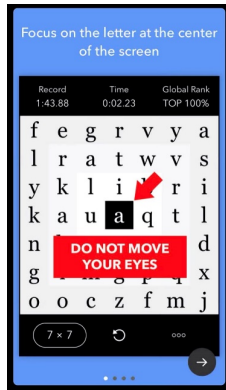
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# Additional Resources

[IQ2 Download](#)

[Kinetic Visual Acuity Download](#)



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