

# Ocular/Visual Injuries within Athletics

Triage, Side-line Diagnosis, and Rehabilitation

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# Disclosures

- Affiliations
  - Illinois College of Optometry
  - Concordia University of WI
  - Industry/Corporate – NONE
- Any discussion of specific products/programs as well as treatment recommendations are based on my own clinical experience and results.
- The views expressed in these slides, as well as our discussion are mine.
- Participants must use appropriate discretion when using the information contained in this presentation



# Dr. Kyle Ross, OD/FAAO

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Head Optometrist, Fisher Branch Health Clinic, CAPT James A. Lovell FHCC, Great Lakes IL 2011-2014

- Adjunct Clinical Instructor for the Illinois College of Optometry
- Fellow, American Academy of Optometry
- Member, Beta Sigma Kappa and Tomb and Key, Academic Honor Societies
- Founder, North Shore Eye Health and Wellness, Sept 2014



# Presentation Goals

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- Review basic ocular anatomy essential for the AT
- Develop ATs awareness/recognition of potential ocular and visual injuries that they may encounter within Athletics
- Create and formulate treatment algorithms to facilitate appropriate on field care and referral following injury
- Prepare for incorporation of screening tools such as the King Devick Test, to better determine Return-to-Play of the concussed Athlete.
- Define the common visual sequelae from mTBI (concussions) that may limit/delay Return to Play in the concussed Athlete

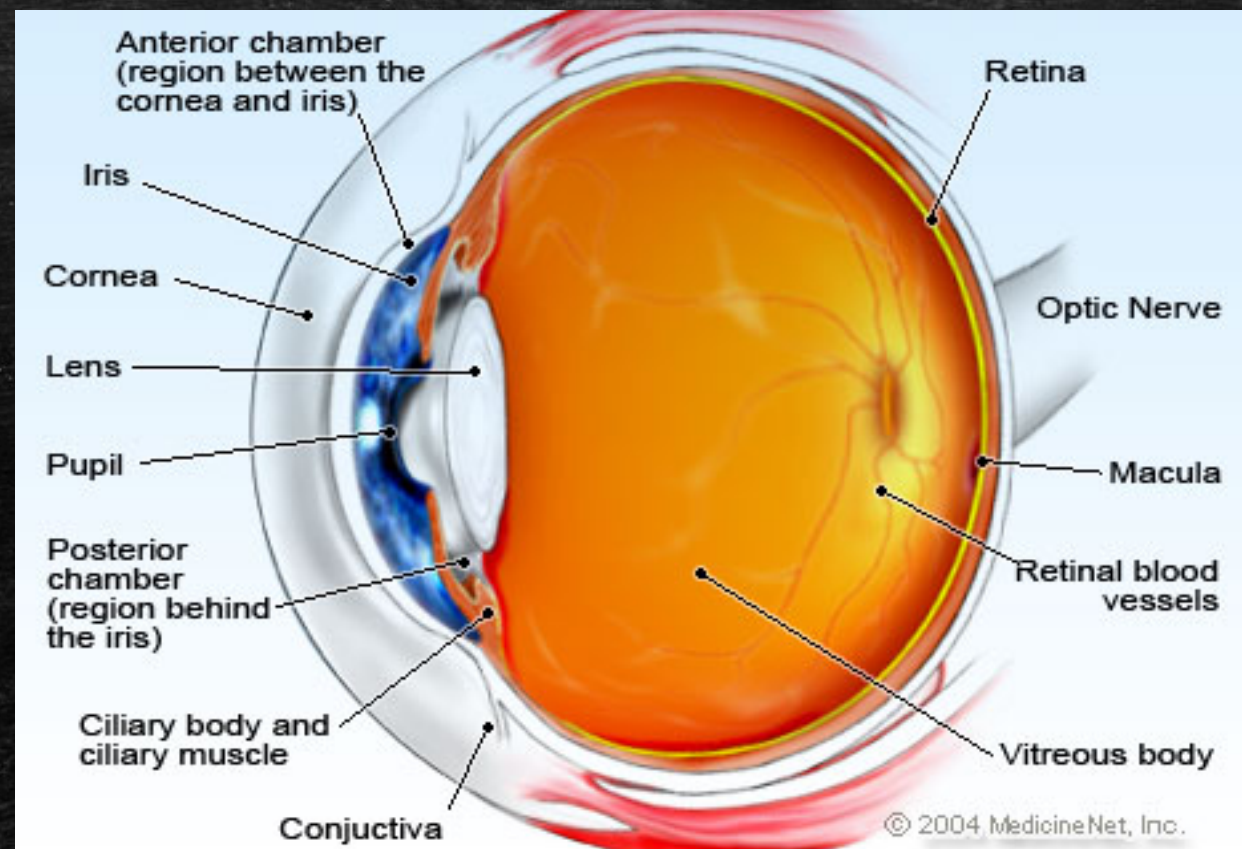
# Ocular/Visual Injuries within Athletics

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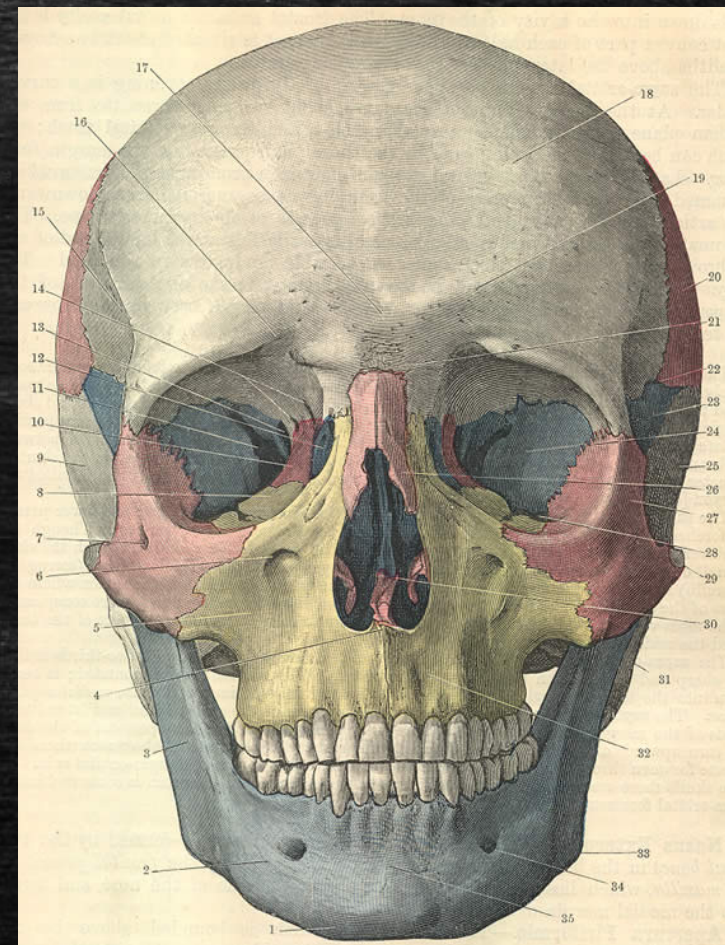
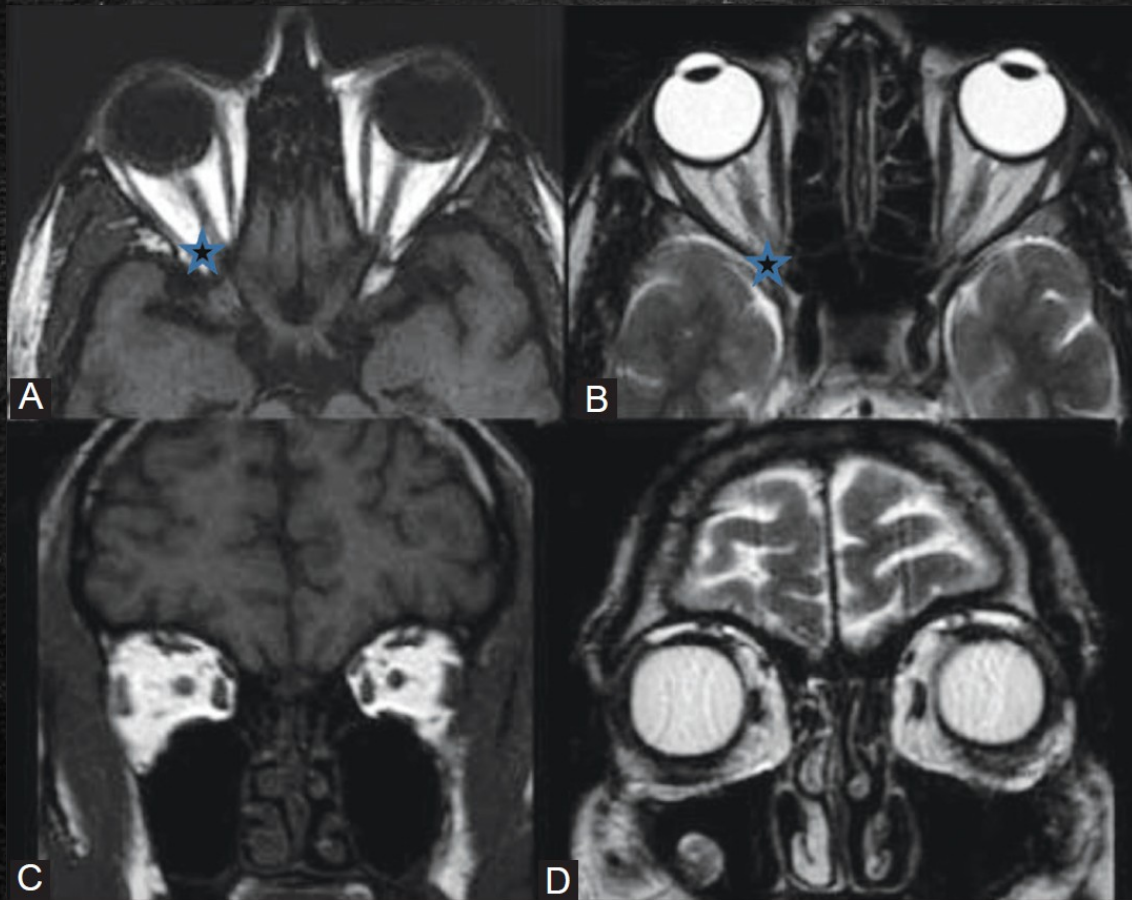
- Ocular -- trauma
- Visual/Vestibular – concussion/TBI
- Binocular Vision Rehabilitation
- Nutrition



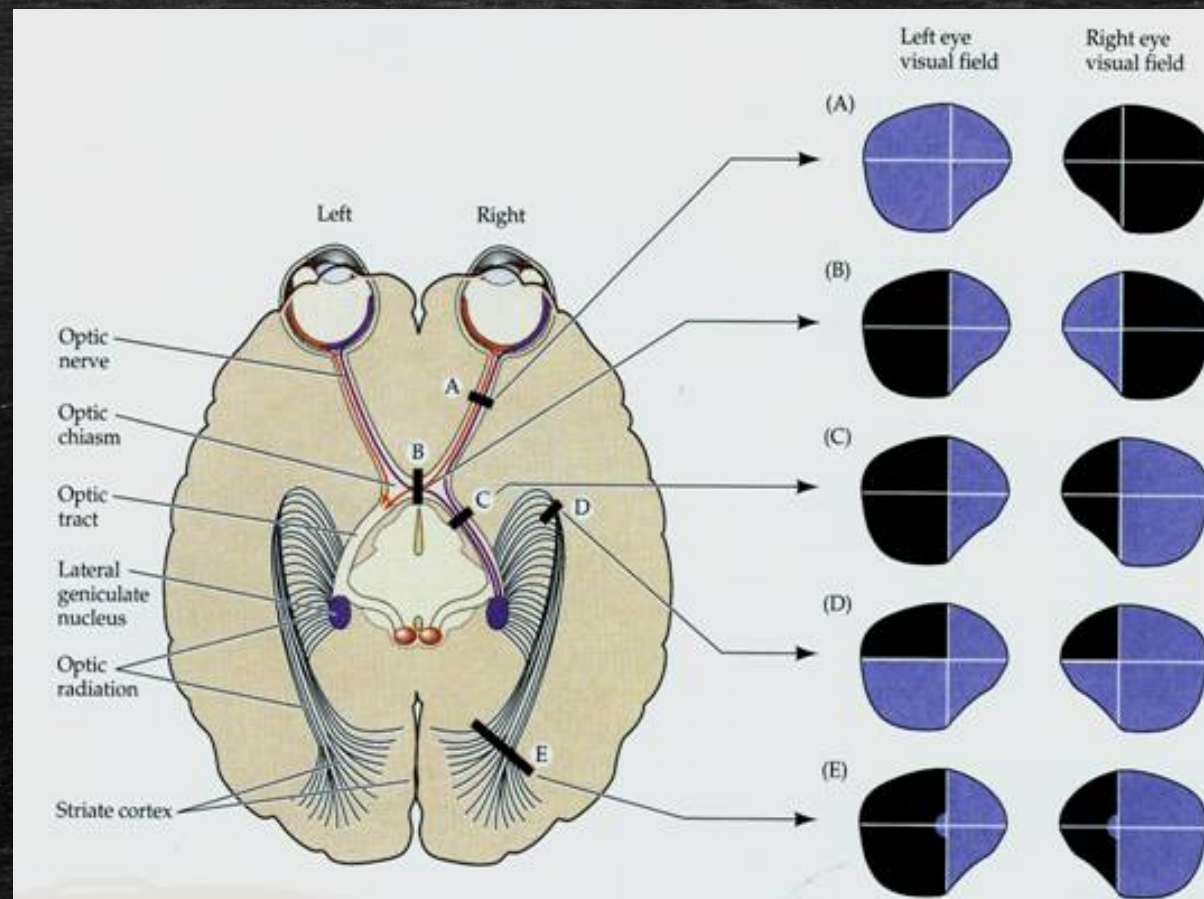
# Ocular Anatomy 101



# Ocular Anatomy 101



# Ocular Anatomy 101



# Common, Sports Related Ocular Injuries

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- Corneal abrasion – Contact Lenses, LASIK
- Orbital Fracture
- Retinal Detachment
- mTBI/Concussion

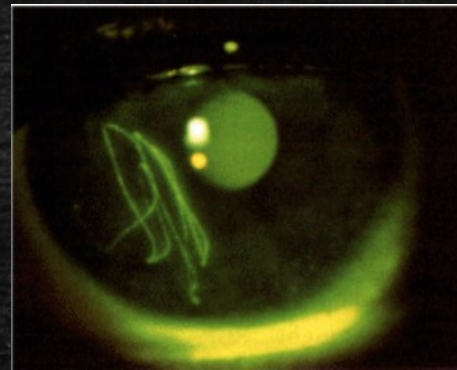


# Corneal Abrasion

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## Sideline Dx

- Pain
- Photophobia (light sensitivity)
- Epiphora (tearing)
- Hard to open eye
- Blurry vision
- STAIN – NaFl strip, Burton Lamp
- CL wearer? h/o Refractive Surgery?



# Corneal Abrasion Cont.

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- Sideline Tx:
  - Flush
  - Stain
  - Stabilize – patch, tape, dark glasses
  - Refer
  - Proparacaine? Tetracaine?
  - Referral to Eye Doc

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# American basketball player OK after eye pops out of socket

AP Published 5:31 a.m. ET Jan. 27, 2017 | Updated 3:16 p.m. ET Jan. 27, 2017



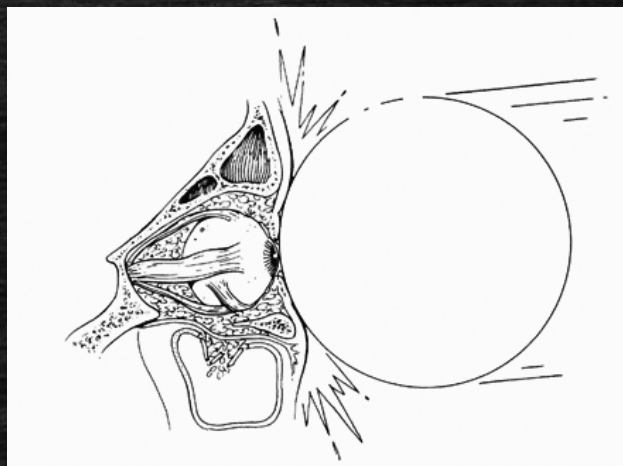
Former Virginia basketball player Akil Mitchell is fortunate to have vision in his left eye after a freak injury on Thursday. Time\_Sports



# Orbital Fracture

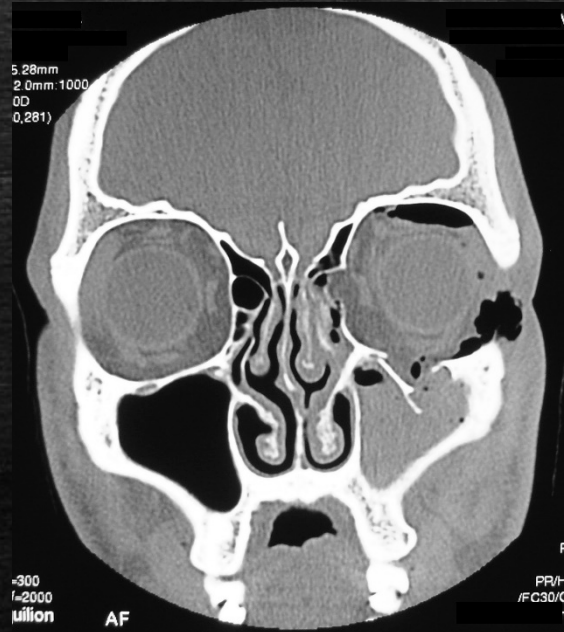
Sideline Dx:

- Pain
- Double Vision
- Restricted Eye Movements
- Nausea/Vomiting
- Swelling
- Crepitus
- NO BLOWING NOSE



# Orbital Fracture cont.

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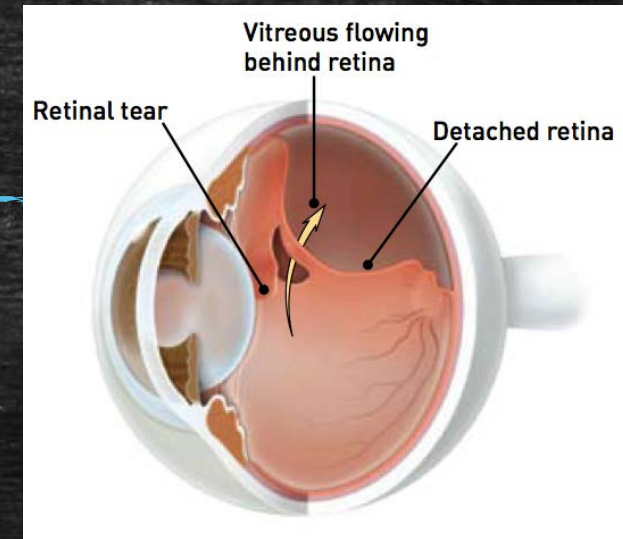
## ■ Sideline Tx

- Keep conscious/regain consciousness
- Pain management
- Corneal abrasion assessment
- Patch/protect
- BUCKET
- Immediate ED visit with plain films/CT

# Retinal Detachment

## Sideline Dx

- Pain? Not from RD
- Blunt force trauma – ball, finger, elbow
- Coup/counter-coup injury
- Loss of vision, curtain or veiling of vision
- Flashes/Floaters



# Retinal Detachment cont.



## Sideline Tx

- Stabilize
- Head above waist
- Referral to Eye Doc

# mTBI/Concussion

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- Sideline Dx
  - HA
  - Temporary loss of consciousness
    - Less than 10% of sports related concussions result in LOC
  - Confusion
  - Amnesia
  - Dizziness
  - Ringing in the ears
  - Nausea
  - Slurred speech
  - fatigue



# mTBI/Concussion

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## Visual Consequences

- Early or Late Onset
- Temporary or Permanent
- Self Resolving or Requiring Rehab
- 67 % of neural connections in the brain are tied to vision
  
- 3 Visual Systems
  - Visual Acuity
    - blurry vision, Accommodative Dysfunction, photophobia
  - Visual Efficiency/Binocular Vision
    - Convergence Insufficiency, double vision, Oculomotor Dysfunction
  - Visual Processing
    - Slowed rxn time, decreased visual perceptual skills, delayed visual processing

The consumption of soft drinks by American youth is increasing. National dietary surveys show that carbonated soft drink consumption more than doubled in youth between 1965 to 1977 from about 55 calories per day in 1977-78 to 112 calories in 1994-98, the most recent years for which national data is available. Additionally, they've said that consumption more than tripled during those years.

There are at least two negative results to this soft drink explosion. First, the use of soft drinks is likely related to the rise in childhood obesity. A variety of studies suggest that we don't eat fewer calories from other sources when we increase calories from beverages. If a child drinks 9 to 100 calories of a soft drink, that's equivalent to almost 100 calories.

Failing to clean off your desk before lunch not only raises the risk of salad dressing spilling onto your work, but it could also increase your chances of getting sick. A new report shows that close to half of Americans don't clean their desks before eating at them, and a third don't wash their hands, which may foster the spread of infectious diseases like colds and flu.

Due to a shortage of the flu vaccine this year, health officials have urged the public to take measures to reduce their risk, and researchers say improving at-work hygiene and hand washing habits could have a major impact in reducing sick days. "Desks, phones, door knobs, conference tables, fax machines and other common workplace areas can be breeding grounds for bacteria-spreading germs," says Brian Sansoni, spokesman for the Soap and Detergent Association, in a news release.

Behrman and Goway (1988, 1998) reported a positive effect on the experimental group's reading comprehension, reading accuracy, and rate of reading. Adler and Cross (1997) evaluated the results of their 23 remedial high school students and a matched control group. Significant improvement for the experimental group was noted for time needed to locate words on a printed page, timed reading scores, length of time for sustained reading, and span of focus, as well as other perceptual tasks. Additionally, seven of the 23 experimental found employment, but none of the control group was employed by the end of the semester.

In contrast, Wilson (1987) was unable to find differences in his study. Wilson gave 15 remedial students 10 items four minutes to locate and circle 60 examples of the letter 'e' on three pages, each page of which contained 600 random letters. Wilson's

As any parent, grandparent, or baby-sitter knows, some babies are adaptable, placid, and regular in their habits, while others are difficult and unpredictable. Differences in temperament show up from the first day of life: some infants sleep very little, others sleep a lot; some infants are highly sensitive and cranky, others are quiet and unresponsive.

Some researchers have not been exposed to the world for long, environmental factors beyond the womb can hardly account for such differences in temperament. Rather, the differences must be largely a result of genetic influences. Yet there have been few, if any, attempts to relate different biological environments at birth to newborns' behavior.

Once upon a time  
there was  
a boy named  
Jack. He lived

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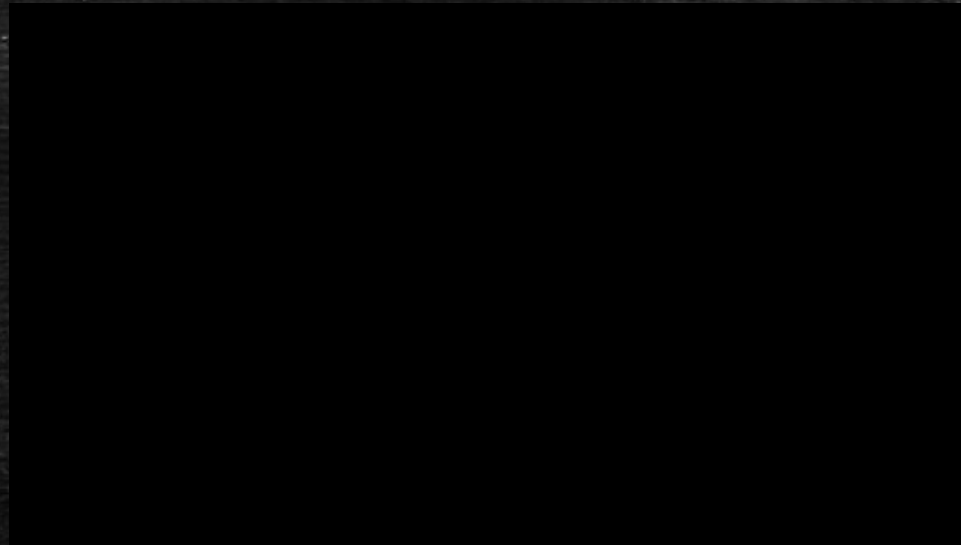
Once upon a time  
there was a boy  
named Jack. He  
lived in a shack  
at the edge of a

# mTBI/Concussion

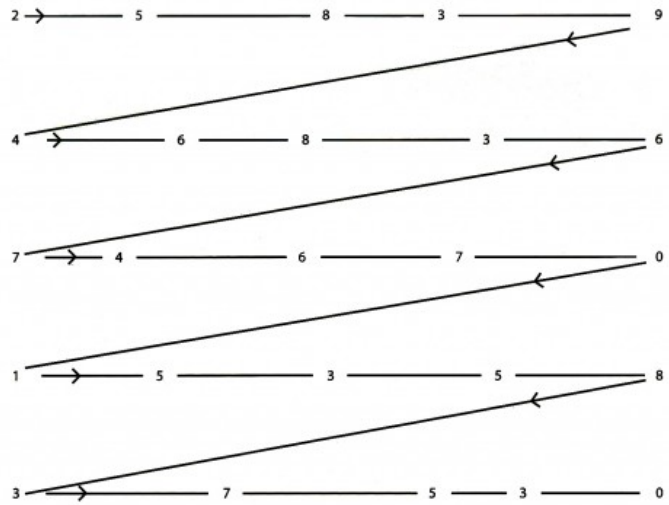
## King Devick Test

[kingdevicktest.com](http://kingdevicktest.com)

- Baseline
- Used for sideline dx
- Simple, easy, App!
- Tracks visual eye movements (saccades and pursuits)



<https://youtu.be/oUFtncyhHmY>



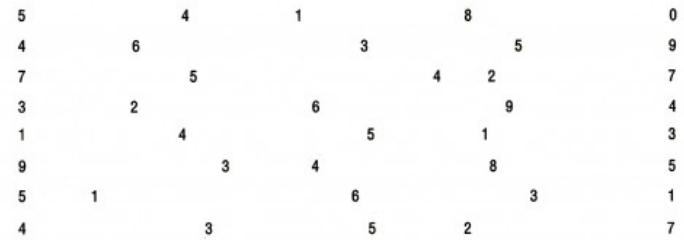
DEMONSTRATION CARD



TEST I



TEST II



TEST III

# King-Devick Test

Originally designed in 1979 – test for saccadic eye movements = reading

Screens for:

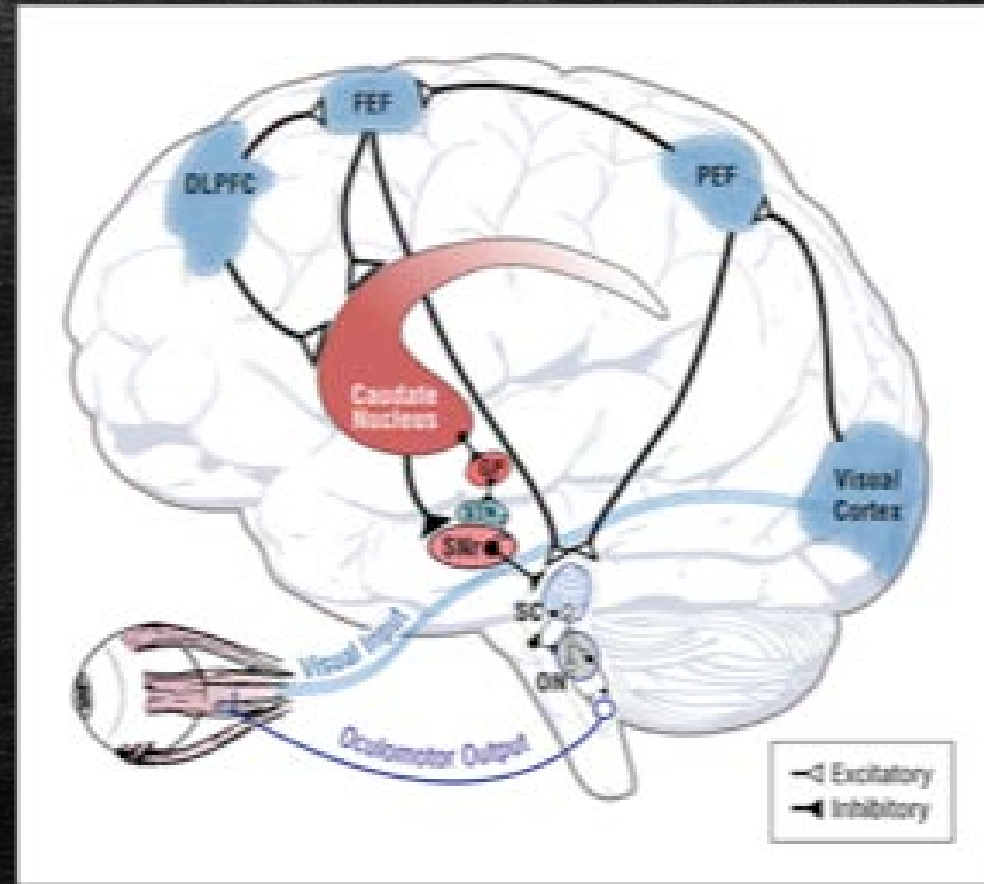
Saccades

Attention

Concentration

Speech/Language

Components of oculomotor response are scattered throughout the brain – ie hard to miss when suffering a brain injury

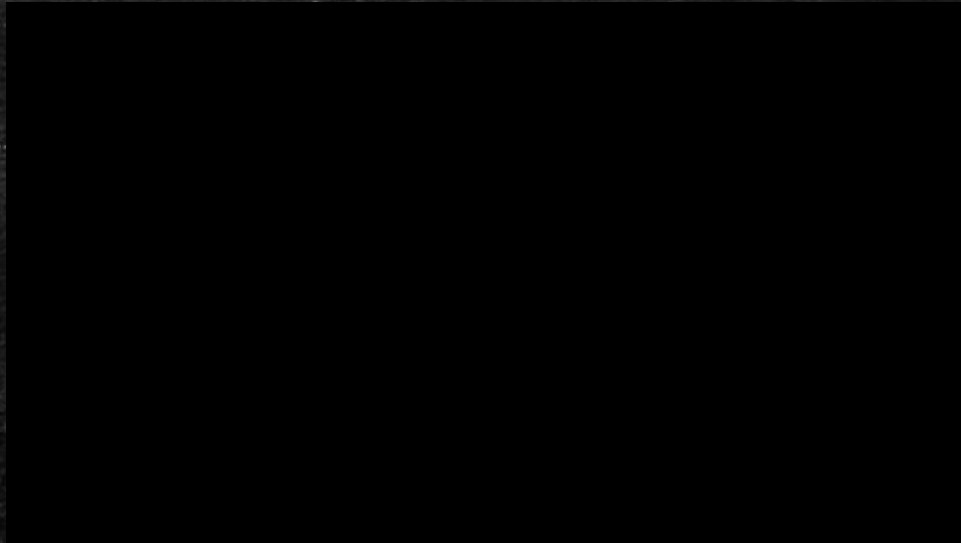


# Does it Work?

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- Recently, has been used in numerous studies for sideline dx of concussion and for determination of “return to play”
- Journals:
  - Neurology
  - Neuro-Ophthalmology
  - Optometry
  - American Academy of Ophth
  - The Lancet
  - Neuro-sciences
  - Sports Medicine and Physical Fitness
  - Child Neurology
  - The Mayo Clinic
- *86% Sensitivity, 90% Specificity for concussed athletes having reduced K/D scores*

# Sport Vision Rehabilitation



<https://youtu.be/BFGBoZITvxk>

## Vision Therapy

- Exercises designed to target and improve visual efficiency and visual processing skills

## Devices

- Glasses, filters, contact lenses

## Ocular Nutrition

- Improving contrast sensitivity and rxn time
  - Lutein
  - Zeaxanthin

# kingdevicktest.com

## Recovery Acceleration Program (RAP) Software



King-Devick Recovery Acceleration Program is an at-home computer based program that trains eye movements and rapid number naming to improve oculomotor deficiencies associated with inefficient reading. The subject's task is to quickly read aloud the presented targets.

- Design individual customized protocols by setting the target speed.
- Gradually increase demands while training.
- Administer benchmark assessments to monitor improvement.
- Track progress and provide motivation with individualized performance reports.

Purchase includes one software activation code for one individual to download to an at-home computer. 1-year renewable subscription. Minimum size monitor 13" or larger. Optimal for Windows OS.

*Enter the number software activation codes you would like to order (one per individual).*

**Price: \$80/Activation Code**

Quantity:

**ADD TO CART**

If you are a health care provider and would like to purchase King-Devick Recovery Acceleration Program (RAP) for your practice, please click [here](#).

QUESTIONS?

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Thank you!

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