Concussions: Clearing the Cobwebs

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Objectives

Why does this matter?

Understand the diagnosis

Recognize concussion mimics

Evidence based treatment

Set appropriate expectations
Concussion has become a big deal
Alcohol Dependence
Cognitive Problems
Anxiety
Alzheimers Dementia
Depression
Substance Abuse
Dementia Pugilista
Subconcussive Injury

AKA Microtrauma

Heading ball

Cheerleading

Wrestling

Gymnastics
Concussion in Sports Group (CISG) 2017 Consensus Statement on Concussive Head Injury

Direct or impulsive force transmitted to head/neck/face

Neurological dysfunction that resolves spontaneously

Neuropathological changes, functional rather than structural

Recovery in sequential course

No alternative explanation
History

- Trauma
- LOC
- AMS

Now

- Headache
- Nausea/Vomiting
- Gait Instability
- Visual Disturbance

Exam

- Photophobia
- ↓ Vision Acuity
- Dysmetria
- Somnolence
History

Trauma
LOC
AMS

Now

Headache
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Exam

Photophobia
Vision Acuity
Dysmetria
Somnolence
History
- Trauma
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Exam
- Photophobia
- Vision Acuity
- Dysmetria
- Somnolence
Are We Underdiagnosing Concussion?

40% of PEM

90% Met Zurich Diagnosis

When it’s more than a concussion
Subdural Hematoma
SAH
Skull Fracture
Mass Lesions
When It’s Not Just a Concussion

Who Needs Imaging?
Gestalt

PECARN

CHALICE

CATCH

ciTBI

NSU Intervention

Intubated

Admitted

Death
<table>
<thead>
<tr>
<th></th>
<th>PECARN</th>
<th>CATCH</th>
<th>CHALICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>99-100%</td>
<td>92%</td>
<td>93%</td>
</tr>
<tr>
<td>Specificity</td>
<td>52-59%</td>
<td>70%</td>
<td>77%</td>
</tr>
</tbody>
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Babli et al, Lancet, June 2017
What About Gestalt?
Mental Status

- Worsening Headache
- Repeated Emesis
- Focal Symptoms
- Slurred Speech
- Neck Pain
- Seizure
- Mental Status
Intermediate risk?
Observation over CT

FAST MRI?
Vomiting

Single Episode?

0.2% ciTBI

Multiple?

2% ciTBI

Dayan et al, Ann Em Med 2014
3 Minute Talk

A 3 Minute Talk Can Save Unnecessary Follow Ups
Symptom Duration

75% at 1 week
50% at 2 weeks
33% at 4 weeks
NSAIDs, APAP

Anti-emetics

Cognitive Rest

Eye Rest
Bed Rest v. Return to Activity

Thomas et al, Pediatrics 2015
5d bed rest v. gradual return
No difference in neurocognitive outcomes
More postconcussive symptoms in bed rest

Grool et al, JAMA 2016
Conservative rest v. early physical activity
Postconcussive sx at 28d
29% early activity
40% conservative

Benefits of Strict Rest After Acute Concussion: A Randomized Controlled Trial

Association Between Early Participation in Physical Activity Following Acute Concussion and Persistent Postconcussive Symptoms in Children and Adolescents
1: Home, brain rest

2: Return to school 1-3 hrs/day

3: Full day of school, maximal supports

4: Full day of school, moderate supports

5: Full day of school, minimal supports

6: Full school, no supports
1: No activity, brain rest
2: Light aerobic exercise
3: Sports specific activity
4: Drills without body contact
5: Drills with body contact
6: Full return
Post-Concussion Syndrome

Used to be sx after 3 mos

Now sx after injury

>3 months

Persistent post concussion syndrome
Post-Concussion Syndrome

Headache

Fatigue

Behavior Change

Nausea

Photophobia

Dysequilibrium
When Can I Get Back On The Field?
What’s the Damage Doc?
Second Impact Syndrome

Concussion => PCS => 2\textsuperscript{nd} Concussion

Cerebral Edema, Herniation, Death

94 suspected cases in 13 year period
Neurocognitive Testing

May be done on follow up

Some have as a baseline

Objective data (no emotion)
Who Does Follow Up?

- Athletic Trainers
- Family Medicine
- Sports Medicine
- Pediatricians
To Review

Criterion to Diagnose
Transmitted force to head/neck
Associated neurological symptoms
Sequential return

Don’t miss dangerous mimics
PECARN criteria
Red flag symptoms

Set expectations, assuage fears (tests)
Disney method, $\frac{1}{2}$ with symptoms at 2 wks

OTC analgesia, rest
Structured return