CONCUSSION POLICY UPDATE

Racing Safety and Technology Seminar

Performance Racing Industry

December 13, 2013

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CONCUSSION POLICY UPDATE

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DISCLOSURES

- CONCUSSION PROGRAM SUPPORTED BY:

- Asterisk Mobile Medical Center
- Feld Motor Sports, Monster Energy AMA Supercross
- MX Sports

- Shoei Helmets-2012
- 6D helmets -2013

ASTERISK MOBILE MEDICAL CENTER

SPORTS MEDICINE

AOSSM

The American Orthopaedic Society for Sports Medicine

A world leader in sports medicine education, research, communication, and fellowship.

STOP SPORTS INJURIES

Keeping Kids in the

Game for Life

www.STOPSportsInjuries.org

CONCUSSION

- DEFINITION
- Concussion is a complex pathophysiological process affecting the brain induced by direct or indirect biomechanical forces. These forces induced abnormal metabolism resulting in rapid onset altered brain function. This alteration usually resolves spontaneously.

PATHOPHYSIOLOGY OF TBI

- LOSS OF POTASSIUM , GLUTAMATE AND GLUCOSE IN CELLS
- RAPID INFLUX OF CALCIUM
- RAPID DEPOLARIZATION
- ATP PUMPS ARE FORCED TO WORK ON OVERDRIVE
- INCREASE LACTATE LEVELS
- BRAIN GOES FROM HYPERDRIVE STATE TO HYPODRIVE 5-6 HOURS AFTER INSULT.

CONCUSSION 2013

REASONS FOR UPDATE

- SCIENCE OF DIAGNOSIS
- SCIENCE OF RETURN TO PLAY CRITERIA
- SCIENCE OF LONG TERM EFFECTS OF REPETITIVE CONCUSSIONS
- VALDITY AND PREDICTABILIY OF NEUROPSYCHOLOGICAL (NEUROCOGNITIVE) TESTING
- MEDICAL STANDARD OF CARE
- LEGAL ISSUES **CALIFORNIA AB 25**
- **NFL SETTLEMENT 765 MILLION**

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FIM MEDICAL CODE 2011

- HEAD INJURIES page 58

- Assessment of the injured rider and return to competition should be in accordance with the guideline for the assessment and management of concussion as contained within the "Consensus Statement in Sport following the 3rd International Conference on Concussion in Sport held in Zurich in November 2008"
- Sportsconcussions.com/html/Zurich%20statement.pdf

CONCUSSION GUIDELINES

- Consensus statement on Concussion in sport:
- The 4th International Conference on Concussion in Sport held in Zurich, November 2012

McCroryP., Meeuwisse, WH, Aubry M, et al., British Journal of Sports Medicine, 2013;**47**,250-258.

Also available online including updated SCAT3 and SCAT3 child.

GOALS

- To accurately, effectively and efficiently diagnosis acute concussions in our athletes
- To efficiently return the athlete to COMPETING SAFELY based upon modern quantitative medical evaluations
- To standardize and coordinate the medical evaluation and treatment of each concussed athlete and insure proper clearance prior to RTP

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CONCUSSION


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WHERE AM I? HOW DID I GET HERE? WHEN CAN I GO HOME?
YOU'VE GOT A DISLOCATED SHOULDER.

CONCUSSION


In the Bleachers © 2013 Steve Moore. Dist. by Universal Uclick
www.gocomics.com/inthebleachers
MOORE
11/15
"You'd better sit out the rest of the game. You might have a concussion."

ATHLETES AT RISK

- MALE
- Football
- Wrestling
- Soccer
- Pole Vault
- Gymnastics
- Basketball
- Baseball

- FEMALE
- Cheer
- Soccer
- Pole Vault
- Basketball
- Softball

ATHLETES AT RISK

- FREESTYLE MOTOCROSS
- SUPERCROSS/MOTOCROSS
- ENDURO
- SPEEDWAY
- ROADRACING
- TRIALS

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SYMPTOMS OF CONCUSSION

- Headache, confusion, dizziness, fogginess, feeling slowed down, fatigue, visual disturbances, light and noise sensitivity, memory dysfunction, and/or balance dysfunction
- Dizziness is poor sign for quick recovery
- Nausea, vomiting, and/or seizures are signs of more significant head trauma and require hospital evaluation

Signs of Concussion

- Blank Stare
- Balance Dysfunction
- Visual Disturbances
- Nystagmus
- “The LOOK”

THE LOOK

CONCUSSION GRADING

- Grading of concussion has been shown NOT to be effective in determination of severity, recovery prediction, risk of future concussion, risk of post concussive syndromes
- Grading of concussions is not a part of modern concussion evaluation and care

CONCUSSION

- Results in graded set of symptoms that may or may not involve loss of consciousness
- No abnormality on standard CT or MRI is seen
- 80-90% of concussions resolve over 7-10 days
- **Adolescents have prolonged recovery times**
- A second concussion episode prior to recovery from the initial can cause prolonged or permanent damage
- Post concussive symptoms can persist for extended periods of time up to a lifetime

CONCUSSION PREVENTION

- ??? ???

FORCES TO HEAD

- DIRECT
  - Direction and magnitude
  - Single or multiple
- INDIRECT
  - Deceleration
  - Acceleration
- OPPOSING FORCES

- FOOTBALL
  - Average speed 21mph
  - 100-140 hits per game
  - MOTOCROSS
  - Higher speeds
  - Lower frequency
  - Deceleration injury

MECHANISMS OF INJURY

PREVENTION OF INJURY

- HELMETS
- MOUTHGUARDS
- NECK BRACES
- HANDLEBAR ROLLS
- TRACK SAFETY

HELMETS

Helmet testing and standardization

At the Helmet Safety Institute.

HELMET DESIGN

- STANDARD
- SHELL OF POLYCARBONITE OR OTHER MATERIAL
- INNER LINING OF EXPANDED POLYSTYRENE (STYROFORM)

- 6D HELMET DESIGN
- Shell of Carbon fiber/polycarbonate but more flexible
- Inner thinner layer of EPS
- Middle layer of elastomers
- Central layer of EPS

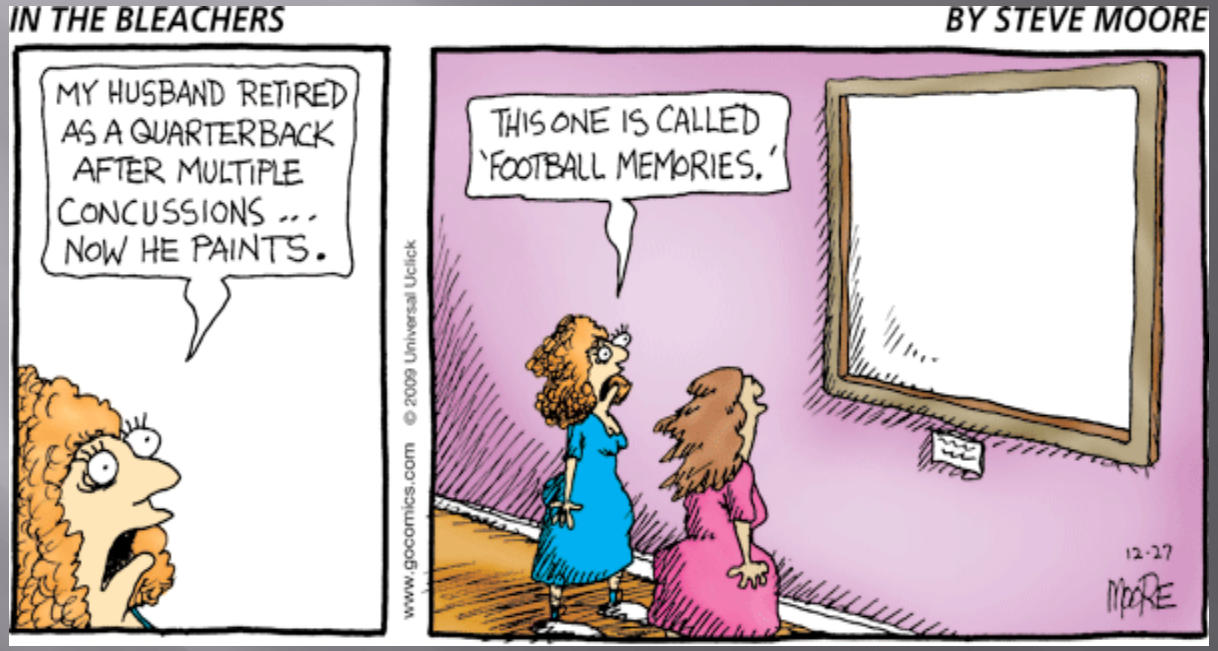
6D HELMET DESIGN

PREVENTION

POST CONCUSSIVE SYNDROME

- Gradual Long Term permanent progressive changes
- Related to number and frequency of injury
- Cerebral Atrophy
- Permanent Progressive Memory Loss
- Depression
- Loss of Ability to Work
- Loss of Ability to Socialize
- Increase risk of Alzheimer type Dementia

POST CONCUSSIVE SYNDROME



CONCUSSION EVALUATION

- GAME DAY
- History and physical examination at rest
- History and Physical Exam during and after graded exercise
- Acute SCAT3 testing- on site neurocognitive evaluation test
- SCAT3 not appropriate for return to ride decisions post concussion

SPORTS CONCUSSION ASSESSMENT TOOL-3

SCAT-3

ORIENTATION QUESTIONS-IMMEDIATE AND DELAYED RECALL

CEREBELLAR TESTING BALANCE ERROR SCORING SYSTEM

PHYSICAL SIGNS

MODIFIED MADDOCK'S SCORE

GLASCOW COMA SCALE

PEDIATRIC FORM NOW AVAILABLE

MRI and CT Scans

- Not Helpful to determine Concussion diagnosis
- Indicated if any signs or symptoms of intracranial bleeding or focal neurological signs
- May be helpful if concussive symptoms are prolonged
- Functional MRI is a research tool that may be helpful in future
- Extensive Research is in progress for a serum (blood) marker for concussion

ImPACT TESTING

- Neurocognitive computer based test
- Most specific when post concussion test is compared to baseline
- Most specific when given 48-72 hours after concussion onset
- Validation and predictability studies
- Measures Verbal and Visual Memory, Visual Motor Speed, Reaction Time, and Symptom Score pre and post test.

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ImPACT TEST

- Baseline tests
  - Most accurate comparative tool
  - National Norms have been developed
  - Our athletes do not have typical education (home schooled)
  - Many of our athletes are international
  - Test can be given in 20 languages
  - Test is validated to detect “sandbagging” to prevent artificially low baselines.

RETURN TO PLAY CRITERIA

- NORMAL PHYSICIAN EVALUATION
- NORMALIZED NEUROCOGNITIVE EVALUATION
- COMPLETION OF A GRADED EXERCISE PROGRAM AND RETURN TO ACTIVITY

RETURN TO PLAY CRITERIA

AMMC EXERTIONALTESTING PROTOCOL

Exercises are to be done in order from 1-4, 5* no rest. Symptoms checked immediately after each bout and recorded. If symptoms are present at any point during exercise or in transition STOP testing rest 24 hrs resume testing when symptoms have subsided.

DAY 1- GYM

1. 10 min non-impact cardiovascular training <70% MHR bike, rower, elliptical.
2. 10 min low impact cardiovascular training <70% MHR jogging, stairmaster.
3. Strength Training 1 min ea. push-ups, sit-ups, squat thrusts, plank DB row.
4. Strength/Cardia 15 sprint /45 sec jog X 5 min BURPEES, P/U mt.climbers, versaclimber, stairs.
5. Sport Specific Drills: *(If available at training location)* Starts, rut track, corners.

IF no change or increase in symptoms move to next step

Day 2 - TRACK

1. 10 min low impact cardiovascular warm up <70% MHR jump rope, jog, bike.
2. 5-10 min ride full track 50-70%
3. 15 min moto 50-70%
4. 15 min moto 50-70%

IF no change or increase in symptoms move to next step

Day 3 - TRACK

1. 10 min low impact cardiovascular warm up <70% MHR jump rope, jog, bike.
2. 5-10 min ride full track normal practice
3. Sprints or Heat Races 100%
4. (1) 15 or 20 lap Moto 100%

IF no change or increase in symptoms return to race decision made my AMMC medical staff

RETURN TO PLAY CRITERIA

- All three components must be normal in adult riders (18 and over)
- Criteria for athletes under 18 will err towards no playing if any question due to increased risks in pediatric patients.

MOTORCYCLE RACING CHALLENGES

- RIDERS ARE INDEPENDENT RACE THROUGH INJURY MENTALITY
- NO PRE RACE EVALUATIONS ARE REQUIRED
- PRACTICES CAUSE CONCUSSIONS
- RIDERS COME FROM WIDE GEOGRAPHIC BACKGROUND
- MANY RIDERS ARE FROM RURAL AREAS
- FOLLOW UP OF INJURIES IS DIFFICULT

CONCUSSION REHABILITATION

- Relative physical and mental rest
- Avoidance of potential for re-injury until brain metabolism returns to normal
- Avoidance of excessive visual stimulation (video games, movies, bright lights
- Modification of school work
- Balance and vestibular rehabilitation
- Gradual Return to Exercise and Contact Activities

POST CONCUSSION FOLLOWUP

- Follow up with Certified ImPACT Consultant in riders local area in 48-72 hours-Asterisk to help coordinate
- Follow up exam to include all three components including exertional and ImPact testing
- Report to be sent to Asterisk
- If normal may return to ride next weekend
- If abnormal will need more recovery time and repeat evaluation and testing.

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CONCUSSION RECOMMENDATIONS

- RACE DIRECTORS
  - QUALIFIED MEDICAL PERSONNELL
  - KNOWLEDGE OF RACERS AND PREVIOUS HISTORY OF CRASHES AND/OR INJURY
  - EMPOWERING MEDICAL PERSONNEL TO REQUIRE MEDICAL EVALAUTION
  - SUPPORT MEDICAL DECISION MAKING AS TO RACER FITNESS
  - ENSURE EDUCATION OF RACERS AND SUPPORT STAFF OF CONCUSSION MANIFESTATIONS AND CONSEQUENCES

CONCUSSION RECOMMENDATIONS

- RACE DIRECTORS
  - QUALIFIED MEDICAL PERSONNEL
  - CONCUSSION EDUCATION
  - DISQUALIFICATION OF ATHLETES DETERMINED TO HAVE CONCUSSION
  - ASSERTIVE TO PULL OFF ATHLETES WHO ARE AT RISK TO THEMSELVES OR OTHERS.

CONCUSSION RECOMMENDATIONS

- RIDERS AND PARENTS
  - CONCUSSION EDUCATION
  - PURCHASE QUALITY EQUIPMENT
  - BASELINE NEUROCOGNITIVE TESTING
  - NO RIDING AFTER A CONCUSSION UNTIL CLEARED BY QUALIFIED CONCUSSION HEALTH CARE PROVIDER

FUTURE NEEDS AND DIRECTIONS

- FUNDING
- Insurance purchased for all riders to cover medical care
- Coordinate research among motorsports and use previous research from football and military
- Research-Determine of force vectors in each sport-crash analysis and remote monitoring
- Helmet Research
- Post Concussion Balance and Cognitive Function Training

CONCUSSION

QUESTIONS

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