CONCUSSION POLICY UPDATE

Racing Safety and Technology Seminar
Performance Racing Industry
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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
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
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.
REMEMBER THE GOOD OLD DAYS WHEN WE PLAYED SPORTS AND NEVER WORRIED IF WE GOT CONCUSSIONS?

NO.
REASONS FOR UPDATE

- SCIENCE OF DIAGNOSIS
- SCIENCE OF RETURN TO PLAY CRITERIA
- SCIENCE OF LONG TERM EFFECTS OF REPETITIVE CONCUSSIONS
- VALIDITY AND PREDICTABILITY OF NEUROPSYCHOLOGICAL (NEUROCOGNITIVE) TESTING
- MEDICAL STANDARD OF CARE
- LEGAL ISSUES CALIFORNIA AB 25
- NFL SETTLEMENT 765 MILLION
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
Consensus statement on Concussion in sport:

The 4th International Conference on Concussion in Sport held in Zurich, November 2012


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
WHERE AM I?
HOW DID I GET HERE?
WHEN CAN I
GO HOME?

YOU'VE GOT A
DISLOCATED
SHOULDER.
“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
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”
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

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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
IN THE BLEACHERS

MY HUSBAND RETIRED AS A QUARTERBACK AFTER MULTIPLE CONCUSSIONS... NOW HE PAINTS.

THIS ONE IS CALLED 'FOOTBALL MEMORIES.'
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
GLASGOW 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
Baseline tests

- Most accurate comparative tool
- National Norms have been developed
- Our athletes do not have typical education (homeschooled)
- 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 EXERTIONAL TESTING 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.
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
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.
CONCUSSION RECOMMENDATIONS

- RACE DIRECTORS
  - QUALIFIED MEDICAL PERSONNEL
  - KNOWLEDGE OF RACERS AND PREVIOUS HISTORY OF CRASHES AND/OR INJURY
  - EMPOWERING MEDICAL PERSONNEL TO REQUIRE MEDICAL EVALUATION
  - 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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