



# Consensus Statement from the ARP Concussion Management in Combat Sports

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# Objectives

- To explain what the current standards of care are, regarding return to sport after a concussion is sustained in non-combat sports.
- To review the ARP guidelines of concussion in combat sports recently published in the British Journal of Sports Medicine.
- What steps should be taken to comply with these guidelines.



# Background

- The current return to sport (RTS) protocols in non-combat sports are based on the recommendations of the 5 Consensus statements on concussion in sport.
- International Conference on Concussion in Sport
  - Vienna - 2001
  - Prague - 2004
  - Zurich - 2008
  - Zurich - 2012
  - **Berlin – October 2016**



# Individualized

- Consensus statements recognize that concussions are different from
  - Person to Person
  - Injury to Injury
- Treatment should be individualized
- RTS therefore should be individualized
- Guidelines are guidelines - and should be modified based on athlete, severity of injury, symptoms, sport played and previous history of head injuries



# Everyone has a protocol

- Using the consensus statements as guidelines various organizations have created RTS protocols
- NFL, NBA, MLB, NHL
- NCAA
- Premier league
- NASCAR
- All State high school sport federations



# Typical RTS Protocols

- Concussion is sustained and diagnosed
- Initial Rest Phase (both activity and mental)
- Stepwise progression of activity
- Concussion symptoms completely resolved, back to baseline on neuropsychological testing, normal physical exam
- Cleared for contact
- No problems with contact – cleared for full competition

# RTS Activity Progression Examples

**Table 1** Graduated return to play protocol

<b>Rehabilitation stage</b>	<b>Functional exercise at each stage of rehabilitation</b>	<b>Objective of each stage</b>
1. No activity	Symptom limited physical and cognitive rest	Recovery
2. Light aerobic exercise	Walking, swimming or stationary cycling keeping intensity <70% maximum permitted heart rate No resistance training	Increase HR
3. Sport-specific exercise	Skating drills in ice hockey, running drills in soccer. No head impact activities	Add movement
4. Non-contact training drills	Progression to more complex training drills, eg, passing drills in football and ice hockey May start progressive resistance training	Exercise, coordination and cognitive load
5. Full-contact practice	Following medical clearance participate in normal training activities	Restore confidence and assess functional skills by coaching staff
6. Return to play	Normal game play	



# Return to Learn

- In many cases with the student athletes academic accommodations are made for student athletes
- Mental rest
- Postpone/extra-time for assignments and tests
- Breaks during the school day
- Decrease reading/computer time
- Increase school work load as symptoms improve



# A word about rest

- Practitioners are moving away from “absolute rest” and going to “relative rest”
- Meaning athletes are now engaging in the first 3 stages even if still symptomatic, provided symptoms do not worsen
- Symptomatic athletes do **NOT** advance past non-contact practice
- More recent research showing that too much rest is a bad thing
- Aerobic exercise is thought to be therapeutic
- Major topic brought up from the Berlin conference



# Computer Neuropsychological Testing

- Different brands are out there
- ImPACT® by far is the most utilized
- Testing looks at
  - Symptoms
  - Memory
  - Processing
  - Reaction time
- Typically baseline testing is done before season
- If injury occurs - scores need to return to baseline level before allowed back to competition

# ImPACT

- Computer test that measures
  - Symptoms
  - Reaction Time
  - Memory
- Baseline prior to the season
- Helps in determining return of play or progression





# Other Baseline Testing

- Some teams/sports do other types of baseline testing in addition to computer neuro-psych testing
- This is done mostly on the professional/college level and not in high school sports
- Again, if injury occurs - scores/measurements need to return to baseline level before allowed back to competition



# Other Baseline Testing

- Balance





# Uncomplicated Case

- A college wide receiver sustains a concussion during a game when he takes a helmet to helmet hit by the opposing player. Immediately after the impact he complains of headache, nausea, and dizziness. He is evaluated by the team physician and athletic trainer on the sideline. His exam is essentially normal except for a slow finger to nose test and balance difficulty. He is then brought back to the locker room for a more thorough evaluation. He is removed from the game and is not allowed to return. He is periodically assessed during the game with no change in exam and no worsening of symptoms.



# Uncomplicated Case

- After the game he says he still has a headache and dizziness but nausea has resolved. The next day he is evaluated with no change in exam or symptoms and is told to relax and take it easy over the next three days. In three days he is still having headaches but the dizziness is improved. He is allowed to ride a stationary bike. He takes the ImPACT test and results show decrease reaction time and processing when compared to his baseline. He states that he had no problems with the bike and does some light jogging the next day.



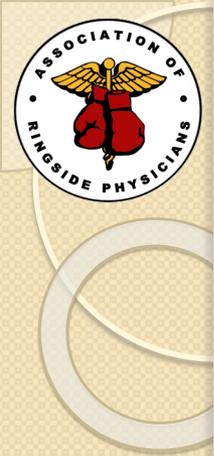
# Uncomplicated Case

- The following day he said that he had a slight headache yesterday morning, but has not had one since. He does some route running and has an easy stationary catch with his athletic trainer. The next day is game day. He remains symptom free and participates in non-padded pregame route running and catching. He does not play in the game but remains on the sideline not in uniform.



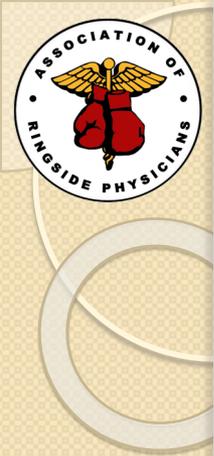
# Uncomplicated Case

- He retakes the ImPACT test early the next week and all scores are back to baseline. The team physician evaluates him and clears him for full-contact practice. He participates in full contact practice all week without issue. He is cleared for full participation and competes in the next game.



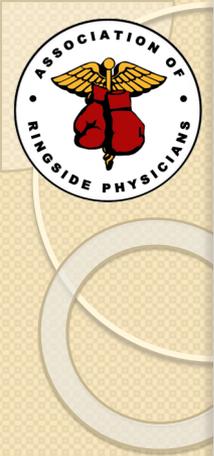
# Guidelines do NOT take into account combat sports

- The purpose of combat sports are inherently different than other sports
- Head contact is an objective instead of an incidental happening
- Considering this, should combat sports be held to a higher standard???



# Current General Practices in Combat Sports

- Interestingly, these practices have been in place long before there was any concussion RTS protocols
- However, nothing has been modified either
- Typically
  - TKO – 30 day suspension
  - KO w/o LOC – 60 day suspension
  - KO w/ LOC – 90 day suspension
- Some states issue suspensions if a fighter went a specific number of rounds



# Current General Practices in Combat Sports

- No recommendations about
  - Return to training
  - Return to sparring
  - When to seek specialist evaluation
- No baseline testing required
- Health care professionals are rarely present during training camps. What happens when a head injury happens then?



# ARP Guidelines

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Consensus statement

## Concussion management in combat sports: consensus statement from the Association of Ringside Physicians



PDF

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Full Text



# ARP Guidelines

- Caveat
  - These guidelines DO NOT address what should happen when a more severe traumatic brain injury – such as intra-cranial bleed – is sustained.
  - These guidelines DO NOT address neuro-imaging
    - Pre-licensure
    - Post-bout



# ARP Guidelines

- **Return to Competition**
  - If a fighter is exhibiting signs of a concussion during a bout, the fight should be stopped.
- **Assessment**
  - All fighters should be evaluated post-bout for signs and symptoms of concussion (Even winners)
  - Evaluation should take place immediately postbout ringside but then repeated in a quiet environment and away from distraction



# Signs of Concussion in the Ring

- Headache
- Dizziness/Loss of Balance/Difficulty Walking/Stumbling
- Vision Problems/Double Vision
- Difficulty Making Eye Contact/Staring Off Into Space
- Nausea/Vomiting
- Becomes Emotional
- Confusion/Not Oriented to Person, Location, or Date/Round
- Slurred/Slow Speech/Slow to Answer Questions
- Walking to the Wrong Corner
- Sluggish/Change in Fighting Style

# Signs of Concussion in the Ring

- During a bout we only have a few seconds
  - Look
  - Complaints
  - Questions
  - Quick Physical Exam
    - Eyes, Balance, Follow Directions



# Post-bout Assessment

- Red Flag Signs & Symptoms



- GCS <15
- ? Skull fracture
- CSF leak
- Seizure
- > 1 episode of vomiting
- Abnormal pupil
- Progressive increase in concussion symptoms
- Deterioration of mental status/overall condition



# ARP Guidelines

- Return to Competition
  - If a combat sports athlete sustains a TKO secondary to blows to the head, he/she be suspended from competition for a minimum of 30 days. It is also recommended that the fighter refrain from sparring for 30 days as well.



# ARP Guidelines

- Return to Competition
  - If a combat sports athlete sustains a KO without loss of consciousness secondary to blows to the head, ihe/she be suspended from competition for a minimum of 60 days. It is also recommended that the fighter refrain from sparring for 60 days as well.



# ARP Guidelines

- Return to Competition
  - If a combat sports athlete sustains a KO with loss of consciousness secondary to blows to the head, he/she be suspended from competition for a minimum of 90 days. It is also recommended that the fighter refrain from sparring for 90 days as well.



# ARP Guidelines

- Return to Competition
  - Under no circumstances should a combat sports athlete compete or engage in sparring activity if he or she is experiencing signs and symptoms of concussion.



# ARP Guidelines

- Return to Competition
  - Combat sports athletes may participate in non-contact training and conditioning one week after sustaining a loss via TKO/KO secondary to head strikes; provided his/her symptoms are improving and do not increase in severity with activity. A gradual activity progression of increased intensity is recommended, starting with light aerobic activity progressing to more rigorous/combat sports specific activity and finally sparring when symptoms have completely resolved.



# Return to Fighting Protocol

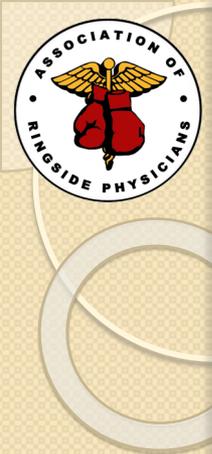
- **Phase I: Return to General Fitness**
  - **STEP 1** Light Aerobic Activity Stationary biking, elliptical, incline walking: gradually escalating heart rate and monitoring through perceived exertion and/or HRM
  - **STEP 2** Moderate Aerobic Activity Jogging, swimming: escalating heart rate to moderate and high-demand activity through HRM or perceived exertion; assess high-level vestibular functioning
  - **STEP 3** Sport-Specific Activity Sprinting, mitts, bag/footwork, walk-through grappling, weightlifting etc.; increasing duration; no partner work \*\*\***Adapted from Nalepa et al.**



# Return to Fighting Protocol

- **Phase 2: Return to Non-contact Fighting Activities**
  - **STEP 1** Bag/Mitt Work with Movement Tests fighter ability to punch and/or kick in multiple planes while testing vestibular and visual systems
  - **STEP 2** Shadow Boxing/Drills Re-introduces fighter to sport environment and re-establish footwork in ring parameter and surface.
  - **STEP 3** One-sided Sparring & Grappling Fighter begins to spar without the concern of contact. Reacts to opponents movements and begins to get timing back for punches, kicks and body position.

**\*\*\*Adapted from Nalepa et al.**



# Return to Fighting Protocol

- **Phase 3: Return to Contact/Sparring Fighting Activities**
- **May only advance to this phase when concussion symptoms have completely resolved**
  - **STEP 1** Sparring - short duration First step of live sparring. Rounds of short duration with long breaks. Number of rounds is small to begin with and then can increase as tolerated.
  - **STEP 2** Sparring - longer duration Rounds at this step begin to lengthen in duration while breaks between rounds shortens. Number of rounds can also increase as fatigue allows.
  - **STEP 3** Sparring - normal parameters Full return to normal training. Return to normal rounds and time limits based on sport and next potential bout. Fighter should be able to tolerate normal parameters of training/sparring, and is training as normal without a return of symptoms.

**\*\*\*Adapted from Nalepa et al.**



# ARP Guidelines

- **Specialist Evaluation**
  - In addition to previous recommended suspensions, it is recommended that a combat sports athlete be suspended from completion until cleared by a physician trained in concussion management if the athlete
    - Is experiencing concussion symptoms 30 minutes after his/her bout.
    - Has an abnormal neurological exam and/or cognitive exam
    - Sustained a knock-out loss with or without consciousness



# ARP Guidelines

- **Specialist Evaluation**
  - Specialist physicians trained in concussion management include
    - Neurologists
    - Neurosurgeons
    - Primary Care Sports Medicine Physicians.



# ARP Guidelines

- Specialist Evaluation
  - What about the fighter who lost by TKO but is not experiencing any concussion signs or symptoms?
    - No need for specialist evaluation
      - Unless covering ringside physician requests
    - 30 day minimum suspension



# ARP Guidelines

- **Baseline Testing**
  - It is recommended that all combat sports athletes undergo some type of neuropsychological baseline testing. If possible, vestibular/ocular and balance baseline testing is also recommended. Repeat baseline testing is also recommended. Repeat baseline testing should occur annually. If there is any decline, it is recommended that a physician who is trained in head injuries and concussion management evaluate the athlete.



# ARP Guidelines

- Education
  - It is recommended that all combat sports athletes and their coaches/trainers be aware of the signs and symptoms of concussion. If a combat sports athlete is experiencing any signs or symptoms of a concussion during training or competition he or she should remove themselves from contact activities and seek evaluation by a healthcare professional.



# Concussion is Treatable

- Concussion symptoms and impairments are treatable
- Concussions in which symptoms last a prolonged period of time, should be managed by a multidisciplinary team with active rehabilitation depending on the individual's clinical profile.
  - Physical Therapy, Psychology, Cognitive Therapy

# Final Recommendations

- Get in the ring
- Follow up on boxers/fighters throughout the night
- Need to catch up to other sports
- Educate



# Final Thoughts...

- Regardless of the jurisdiction you provide coverage in – you can implement these guidelines
- We will continue to modify these guidelines





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# Thank You



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