The Unconscious Boxer

The approach to the unconscious boxer is the most dire emergency the ringside physician faces. The rare though real specter of intracranial hemorrhage and permanent neurologic damage is always in the back of the ring physician's mind.

There are two possibilities when the physician enters the ring for a "Down Boxer". Either the boxer is still unconscious or the boxer is recovering consciousness.

- **The Boxer is Unconscious**

  The physician enters the ring quickly, smoothly, calmly. He approaches the boxer and acts in this order:

  1. **Make sure the boxer is breathing--- if not resuscitation begins**
  2. **Carefully take out the boxers mouthpiece**
  3. **If the boxer needs to be turned onto his back, this is done using "cervical precautions", "log rolling", etc.**
  4. **Cervical Collar put in place**

5. **Headgear** is carefully removed**

6. **Oxygen is started**

7. **The boxer moved to a stretcher (cervical precautions)**

8. **The boxer is transported with "full lights and siren" to the nearest emergency room equipped to handle head trauma (neurosurgical facility).**

   **** Some would prefer to leave the headgear until the boxer arrives in the trauma center. I prefer to remove it in the ring as administration of oxygen, and cervical collar placement seem better without it. When the headgear is removed in the ring, care must be taken not to aggravate any spinal injury.**

- **The Boxer is Regaining Consciousness**

The physician varies his routine based on the circumstances of the boxer. If the boxer is conscious but has remained motionless, the boxer is asked to move his hands and feet. If he has motion, the cervical vertebrae are palpated for tenderness. Once the Boxer is clinically recovered enough to do so, if the boxer's responses are rational, he has full motor control and no cervical tenderness, the athlete is allowed to move with assistance to a nearby stool. The boxer will be observed for pupil size, reaction, balance, coherence, and short term memory. All boxers who have lost consciousness receive a neurological evaluation by the ringside physician. The examination is repeated every few minutes until it is normal.

If the boxer was unconscious for less than one minute the decision to send the boxer to the hospital for complete neurologic work up, MRI/CAT scan, etc. will be up to the evaluating physician. Boxers unconscious for more than one minute should be referred for further evaluation.

In international tournaments as much as possible with language differences, the medical team in charge of post bout examinations should advise coaches and boxers who have suffered a concussion to go immediately to an emergency room should the athlete develop **projectile vomiting**, **unequal pupils**, or **decrease in state of consciousness**. In national tournaments, where language is homogeneous, it is our practice to have prepared "head sheets" for all boxers who have lost consciousness. We ask coaches of the concussed boxers to sign these well as the concussed boxer may not remember instructions.

When a formal "head sheet" is available (in addition to stressing the big three: Pupils, vomiting, and consciousness) it can contain more detailed advice in describing the symptoms of intracranial bleeding.

- **If you observe any of the following changes in the boxer, take the boxer to an emergency room immediately.**
  - **Vision changes**

    Vision changes, any loss of vision, anisocoria, abnormal eye movements or drooping of the eyelid is another red flag for the clinician as would be the onset of any symptoms associated with stroke such as partial paralysis, unilateral weakness, slurred speech, inability to understand the spoken or written word, , decreased sensation, difficulty following command.

  - **Nausea, vomiting (#2)**

    This is usually forceful in nature. The athlete who after a concussion has a severe headache then starts vomiting should draw immediate attention.

  - **Change in level of consciousness (#3)**

    They may be observed as having a decreased alertness or level of consciousness. They may appear as if they do not care what is going on or be very detached. As intracranial pressure continues to increase, they go from lethargic to confused, lose consciousness and become comatose.

- **Headache**

  The Headache is usually progressive and severe. It may be positional or awaken the athlete from sleep. It may be affected by maneuvers that affect intracranial pressure such as coughing or valsalva. This headache is not the typical low level headache that most athletes get after a concussion. It is much more striking in severity or may develop quickly from the ordinary post concussive form. The clinician should not demand all the changes noted at the beginning of the paragraph before sending such athletes for evaluation but at the same time the association of a questionable headache with the other prominent symptoms of intracranial hemorrhage will help make the diagnosis.

  The onset of ANY NEW headache after a concussion demands medical evaluation.

- **Other Neurologic Changes such as**

  They may be observed as having a decreased alertness or level of consciousness. They may appear as if they do not care what is going on or be very detached. As intracranial pressure continues to increase, they go from lethargic to confused, lose consciousness and become comatose. The new onset of seizure is increased intracranial pressure till proven otherwise. These athletes may develop the onset of any symptoms associated with stroke such as partial paralysis, unilateral weakness, slurred speech, inability to understand the spoken or written word, decreased sensation, difficulty following command, loss of motor skills, and loss of coordination or balance.

- **Do not give the athlete any narcotic or sedative medicine for 48 hours as this may mask symptoms.**
- **Do not give the athlete any aspirin containing drugs as this may increase the probability of bleeding.**

The "Two Scenarios"

The Ringside physician should be aware of two quite different scenarios that lead to unconsciousness in any combat sport.

- In the first scenario the downed athlete absorbs a great blow or series of blows to the head so quickly that neither the referee nor the doctor has the opportunity to intervene. Usually, the athlete recovers uneventfully but the

worst case scenario will be intracranial bleeding, most often a subdural hematoma.

- In the second scenario, the athlete is observed to receive a relatively minor blow and many spectators may be surprised to see the athlete go down. On occasion, the athlete may stagger the after some seconds collapse. In this picture the athlete's condition appears to worsen or fluctuate but the trend in downward. This condition represents the "Second Impact Syndrome". The pathology is cerebral edema often accompanied by a small bleed. The mortality rate approaches 50% and permanent neurologic deficit in survivors is common.

The mechanism of action in "Second Impact Syndrome" seems to be that the athlete suffers a very hard blow to the head within a month of the competition. This may be in training but in one athlete it came from falling off a horse. After such a blow, the brain cells may remain in a sensitive state for some weeks. Their metabolism is changed as has been demonstrated in the way they metabolize glucose. Even a minor blow during this period may set off severe or fatal cerebral edema.

There is overlap in clinical picture of bleeding and second impact. The treatment at Ringside is the same--- emergency transport to the nearest facility capable of distinguishing and managing the emergency. The clinical importance is that the appearance of the athlete in the second scenario may lead the unwary Ringside Doctor to delay treatment. Any delay in either scenario may lead to much unhappiness.

Post Concussion Syndrome

Athletes may suffer a concussion without any adverse after effects. All too often concussions are complicated by other temporary mental/neurologic changes. The eight most common problems after a concussion are:
(1) Headache
(2) Dizziness
(3) Fatigue
(4) Irritability
(5) Insomnia
(6) Concentration
(7) Memory difficulty
(8) Intolerance of stress, emotion, or alcohol

The new onset of any three of these symptoms in an athlete who has had a blow to the head are diagnostic an otherwise missed concussion. They are considered complications of a concussion and may be referred to as the "post concussion syndrome." [Ref. *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)]*

Many other complications of concussion are recognized in areas of cognition, emotion, and behavior. The ringside need not "learn" them but should recognize them when they occur. Many of these are listed in the appendix following this article.

To summarize the above, if a physician wants to work in any contact sport this is the most important and first information to be learned. Every ringside physician should know exactly the steps for management of the unconscious athlete and how to manage the athlete regaining consciousness. Physicians without much experience or who serve only occasionally might want to write the steps on an index card for their pocket to review before the start of the day's competition or for needed reference.

Appendix to the Unconscious Boxer

More Detailed List of Findings in Post Concussion Patients

Physical

- **Headache (Same Type They Experienced Before Injury)**
- **Dizziness**
- **Sensitivity To Light Or Noise**
- **Decreased Sense Of Taste**
- **Decreased Sense Of Smell**
- **Blurred Vision**
- **Double Vision**
- **Tinnitus.**
- **Loss Of Hearing Occurs In 20% Of Cases.**
- **Sleep Disorders**
  - **Insomnia**
  - **Fatigue**
  - **Sleepiness**
  - **Other Problems**
- **Nausea/ Vomiting**
- **Stress/Alcohol----Decreased Tolerance**

Psychological

- **Emotional:**
  - **Irritability**
  - **Anxiety**
  - **Depression**
  - **Aggression**
  - **Mood Swings**

        - Apathy
        - Emotional Lability
        - Anger
- Personality Changes
- Restlessness
- Decreased Libido
- Loss Of Social Judgment
- Impulsiveness

Thought Process Disturbance

- Attention Problems
- Confusion or Impaired Cognition
- Difficulty With
    - Abstract Thinking
    - Problem Solving
    - Work Performance
    - Social Interaction
- Impaired Judgment
- Memory Problems
    - Amnesia
    - Short-Term Memory
- Slowed Information Processing
- Slowed Reactions To Stimuli
- Neuropsychological Impairments in Speed of Information Processing.