This document was written in order to help our membership with questions pertaining to the movie “Concussion” and the facts about Chronic Traumatic Encephalopathy. As many of our members who attended the AMSSM annual meeting in Florida this past year will remember, the CTE debate is quite controversial, as research in this area remains preliminary. This is not an official AMSSM statement about CTE. This is only a guide for our members in discussion with their patients and communities. Members should refer to AMSSM’s position statement on concussions and the 4th international conference on concussion in sport for more information and their research analysis.[1,2] These bullet points represent the best-known information about CTE. However it is extremely important that we keep in mind that there are more unknowns than known about this condition.

1. CTE is currently defined as progressive neurodegeneration associated with repetitive head trauma and tau protein deposition. It is characterized by memory disturbance, behavioral and personality changes, parkinsonism and speech and gait abnormalities.[3]

2. Association between head trauma and symptoms was first made in the 1920’s with the term CTE first described in 1949. Dr. Omalu is credited with associating this condition with NFL football players.

3. There is an association between some athletes with repetitive head trauma and symptoms of CTE causation is still not known.

4. Although CTE, as a result of concussive and subconcussive blows, is commonly discussed as a disease with a well-defined pathophysiologic process, this process is in fact a proposed hypothesis. This theory, that concussive injury starts a progressive neurodegenerative process, is not yet a scientifically validated entity. All parties studying the CTE issue recognize this dilemma.

5. Phosphorylated Tau depositions have been found in brain autopsies of collision athletes with a constellation of symptoms described in CTE including cognitive, mood, and/or behavioral symptoms. There are many confounding variables, however, that can account for brain tau deposition including genetic mutations, drugs, normal aging, environmental factors, postmortem brain processing and toxins. In addition some collision athletes with symptomatology consistent with CTE have not demonstrated characteristic autopsy findings.

6. It is not yet scientifically known if Tau deposits in the brain can cause depression, substance abuse, suicidality, personality changes or cognitive impairment.

7. All cause mortality and suicide rates in former NFL player are considerably lower than the general population

8. Many knowns and unknowns at this time:
   - Is Tau really a biomarker and a problem, or just a pathologic finding unrelated to the symptoms of CTE
   - It is not known if individuals who never sustained concussion but have other issues such as chronic pain, anabolic steroid use etc. have tau deposition in brain areas considered unique to CTE

9. Summary of CTE from the Zurich Guidelines
   - It was agreed that CTE represents a distinct tauopathy with an unknown incidence in athletic populations.
   - It was further agreed that a cause and effect relationship has not yet been demonstrated between CTE and concussions or exposure to contact sports.
   - At present, the interpretation of causation in the modern CTE case studies should proceed cautiously.

10. Members are encouraged to emphasize the importance of removing athletes with a suspected concussion from participation and not allowing athletes to return to play until they are asymptomatic

References:
