2005: Blast Injury to the Brain: Mechanisms and Prevention

A recent USA today article reports the following:

A growing number of U.S. troops whose body armor helped them survive bomb and rocket attacks are suffering brain damage as a result of the blasts. Traumatic brain injury (TBI) is a type of injury that some military doctors say has become the signature wound of the Iraq war. Milder TBI is often hard to recognize and many soldiers may look fully recovered, but their brain functions remain labored. Deborah Warden, National Director of the Defense and Veterans Brain Injury Center said, “The good news is that in the past these people would have been dead (in earlier wars) but now they’re alive. And we need to help them.”

You learn that the several agencies in the U.S. government have provided funding opportunities to support research into TBI due to blast. Your task is to write a proposal to this agency to study the mechanisms and prevention of TBI due to blast. The focus of your proposal is not treatment. In your proposal report on the following:

1. The mechanisms of brain injury due to blast based on a literature review.
2. How you would perform clinical and field investigations to determine how much of TBI is due to blast and how much is due to other causes such as falls or motor vehicle accidents in military combat.
3. The proposed laboratory studies you would perform to further understand blast injury mechanisms to the brain.
4. The proposed studies you would perform to begin to develop protective devices to prevent blast injury to the brain.
5. If your work is hypothesis driven, state your hypotheses.
6. Provide the statistical methodology to justify the sample sizes in your proposed studies.

What are the anticipated outcomes of your proposed experiments and evaluations? What problems do you anticipate that you are likely to encounter, and how you would overcome those problems?