

## Prehospital Guidelines for the Management of Traumatic Brain Injury – 3rd Edition

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### Introduction

Worldwide, 69 million people sustain traumatic brain injury (TBI) annually(1). The incidence of TBI in low- and mid-income countries is three times greater than in high-income countries, with fatality rates ranging from as low as 5.2/100,000/year in France to as high as 80.73/100,000/year in South Africa (2).

TBIs may range from mild, including concussions, to severe, including coma and death. In general, a TBI is caused by a direct or indirect force to the brain that disrupts normal brain function(3). The vast majority of TBIs are mild, but distinguishing mild injury from more severe TBI in the prehospital setting may not be immediately apparent. Severe TBI is a leading cause of morbidity and mortality, resulting in 2.87 million TBI-related emergency department visits, hospitalizations, and deaths in the United States annually. Approximately one-third of these events occurred in children(3). The likelihood of moderate-severe TBI is heightened in any prehospital patient sustaining physical trauma with Glasgow Coma Scale (GCS) score <15, loss of consciousness, multisystem trauma requiring an advanced airway, or report of post-traumatic seizure(4).

The mortality rate associated with blunt traumatic injury is exponentially increased when associated with TBI. Death from severe TBI often occurs within the first few hours following injury. Prehospital and early management of the primary injury with prevention of secondary brain injury and avoidance of secondary iatrogenic brain insults are critical to maximizing outcomes. Secondary brain injury is a pathophysiologic injury to the brain resulting from related insults that follow the primary event including cerebral hypoperfusion and ischemia, increased intracranial pressure (ICP), metabolic dysregulation, hypoxia, and temperature instability.

In the United States, fatality rates for all causes of TBI are lower in metropolitan areas and increase progressively in more rural areas. These differences are significant both for unintentional and assault-related TBIs depicted in Figure 1(3). Currently, the average fatality rate for TBI from all causes is 22% higher in rural versus urban America. Figure 2 illustrates this disparity(3). These findings strongly suggest that longer transport intervals and limited access to prehospital care may be implicated in higher rates of morbidity and mortality from TBI in these communities.

Emergency medical services (EMS) professionals are most often the first health care professionals to assess and treat a

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# Head Injury 3ed

**Jiyuan Zhang**



**Head Injury 3ed:**

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