Evaluation of AIS3+ car occupant injuries using deterministic and probabilistic methods in frontal crashes

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Abstract-

Computational modeling was used to assess the capability of a deterministic and a probabilistic method to predict the incidence of AIS3+ injuries in passenger car occupants by comparing the predictions of the methods to the actual injuries observed in real-world crashes. The likelihood of sustaining an injury was first calculated using a computer model for a selected set of injury criteria in different impact conditions based on real-world crashes; AIS3+ injuries were then predicted using each method separately. Regardless of the method, the number of serious injuries was over-predicted. It was also noted that the used injury criteria suggested the occurrence of specific injuries that were not observed in real-world. Although both methods are susceptible to be adapted to improve their predictions, the questionof the suitability of using some of the most commonly accepted injury criteria used with crash test dummies for injury assessment with human body models deserves further research.

Index Terms- Serious injuries; HBM; computer models; Madymo; Metamodel

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