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Detection of Internal Injuries in Drivers Protected by Air Bags

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Early results from research being conducted for the National Highway Traffic Safety Administration at Jackson Memorial Hospital in Miami by a team of medical, engineering and crash investigators suggest the emergence of changing injury patterns in motor vehicle crashes in which an air bag has deployed. Emergency medical services (EMS), both prehospital and hospital personnel, as well as the public, could benefit by becoming aware of these changing injury patterns.

Prior to air bags, drivers involved in crashes often had visible injuries such as bleeding, facial lacerations, abrasions, bruises, and broken facial bones that were obvious to rescue personnel. Now, drivers protected by air bags and safety belts often do not have visible injuries.

The research team has found that among drivers protected by air bags, in some severe crashes, serious internal injuries may be present but not be externally apparent. As is the situation with so many cases of blunt trauma (regardless of restraint system) that EMS providers encounter, internal injuries often are survivable if detected and treated in time, but can be fatal if not detected and treated appropriately and promptly.

EMS personnel conducting initial injury assessments should not be deceived by the lack of external injury signs and symptoms customarily associated with crash injuries. The driver protected by an air bag may look fine and feel fine, but not be fine. This may be important even for drivers who are fully ambulatory and apparently uninjured at the crash scene.

To address this situation and increase the chances that these crash victims receive timely and appropriate emergency care, the research team has offered suggestions for improved internal injury detection. One "tell-tale" indicator of injury is deformation of the steering wheel. In the case of a motor vehicle crash in which an air bag has deployed, rescue personnel should **lift the deployed air bag** to look for steering wheel deformation. After removal of the occupant, rescue personnel can easily lift the deflated air bag out of the way and make a visual check of the steering wheel.

Thus, a quick "lift and look" under the air bag should be a part of the routine examination of the steering wheel. Any visible deformation of the steering wheel should be regarded as an indicator of potentially serious internal injury, and appropriate action should be taken.

Steering wheel deformation under the air bag should be used in triage decisionmaking as a supplementary, but not sole, indicator of the possibility of internal injuries. Since steering wheel deformation varies with differing interior design characteristics of vehicles, conditions of the crashes, and occupant kinematics, internal injuries may still be present whether or not the steering wheel has been deformed. The potential for internal injuries is also related to the age, size, and health status or physical condition of the occupant.

One of the findings of this research is the revalidation of the importance of the rapid application of EMS trauma triage criteria. Trauma triage criteria, including such current measures as the Glasgow Coma Score, are essential to providing the best possible lifesaving care to crash victims.

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