
Selected Topics: Prehospital Care

PRIMARY INJURY PREVENTION IN AN URBAN EMS SYSTEM

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□ Abstract—Injury prevention is increasingly recognized as an important part of health care delivery. Emergency Medical Services (EMS) personnel may be called upon to deliver primary injury prevention (PIP) by educating both patients and peers about how to avoid future similar injury. The purpose of this study was to determine EMS provider attitudes toward PIP and knowledge and practice of PIP during day-to-day clinical work. A brief survey was administered to a sample of paramedics assessing their attitudes toward primary injury prevention, how often they practice it, and whether or not they have received any PIP education during their training. One hundred sixty-two paramedics completed surveys. Of those surveyed, 70% believe that PIP should be a core mission of EMS systems, and 82% believe PIP should be implemented at the local or regional level. However, only 33% routinely educate their patients how to modify injury risk behaviors, and only 19% routinely provide instruction about proper use of protective devices. Approximately 63% of our paramedics received any PIP education during their training. A majority of paramedics in our survey believe that PIP should be a routine part of EMS. However, many paramedics have not received any PIP education, and few paramedics practice PIP during their clinical practice. © 2003 Elsevier Inc.

□ Keywords—primary injury prevention; injury prevention; EMS; ambulance; EMT; public health

INTRODUCTION

Injury is one of the leading causes of death and disability throughout all age groups. It also accounts for more years of potential life lost than any other health problem (1). As our nation's health care system evolves, we see more emphasis placed on improving health through preventive care in addition to our routine curative care. The objective of prevention is to control health care costs by preventing people from ever needing certain costly services.

This has led to a call in the Emergency Medical Services (EMS) community for Emergency Medical Technicians (EMTs) and paramedics to begin to learn and practice primary injury prevention during their day-to-day duties (2). EMS personnel are frequently the first medical point of contact for victims of traumatic injuries. They are trained to determine the nature of a traumatic injury and to initiate basic medical therapies to prevent further morbidity and mortality. Ironically, there are few randomized, controlled clinical trials that can draw an association between common out-of-hospital therapies for traumatic injuries and improvements in patient outcome (3).

Primary injury prevention (PIP) refers to activities designed to prevent the occurrence of injuries (4). A variety of successful PIP campaigns have been initiated across America in the last decade to promote usage of

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automobile safety belts, bicycle helmets, and smoke detectors, to name a few. The fire service has worked aggressively to decrease the number of fires and fire-related injuries, and police departments have begun efforts to curb traffic-related injury and death through aggressive enforcement of impaired driving laws (2).

Traditionally, health departments and non-profit organizations dedicated to injury prevention have sponsored such programs, which tend to be broad in scope and implemented at the group level rather than the individual level. However, EMS personnel may be uniquely suited to become individual PIP educators, as they are health care professionals whom the public regards as knowledgeable about trauma. They also work in an environment in which they frequently encounter injuries and spend at least a brief period of time talking directly with the injured person to gather historical details about the injury.

Several reports have documented successful EMS-initiated prevention programs targeting drowning and falls from height (5–7). Two other studies examined the benefits of home fire safety interventions during EMS calls and of using paramedics to identify at-risk elderly (8,9). However, there are few studies in the peer-reviewed medical literature to substantiate whether most EMS providers understand or engage in PIP activities, especially at the individual level. We sought to determine the attitudes of urban EMS personnel concerning their current PIP practices and their experiences with PIP education.

MATERIALS AND METHODS

Study Design

We performed a cross-sectional survey of paramedics within an urban EMS system to characterize their understanding and daily practice of PIP relative to the delivery of emergency medical services and to occupational safety in their workplace. The Temple University Institutional Review Board ruled the study exempt from human subjects review.

Population

The study group was composed of career Philadelphia Fire Department paramedics (PFDP). These personnel are all Pennsylvania-certified EMT-Paramedics who are employed on a full-time basis. At the time of the study, there were 243 PFDP employed within the Philadelphia EMS system, including field providers and administrative personnel. The Philadelphia EMS system has pri-

mary responsibility for emergency medical response within the City of Philadelphia, which has a daytime population of 3.5 million and a nighttime population of 1.6 million. There are approximately 180,000 requests for emergency medical assistance annually, which are handled with 37 ambulances, two-thirds of which are advanced life support units staffed by two PFDP.

Survey and Administration

A close-ended survey questionnaire about EMS PIP activities was created based upon recommendations proposed by a steering committee working within the National Association of EMS Physicians. Questions in the survey instrument pertained to patient and peer PIP education, injury risk perception, and personal and patient injury prevention practices. Responses were recorded using Likert-type scales.

Two of the authors administered the survey to a convenience sample of PFDP during continuing medical education seminars held at the Philadelphia Fire Academy in the fall of 1998. Administrative PFDP staff who did not attend continuing education classes completed surveys at their leisure.

Data Analysis

The data were entered into a commercial spreadsheet database (Microsoft Excel 7.0, Microsoft Corporation, Redmond, WA). Descriptive statistics were used for data reporting.

RESULTS

A total of 162 (67%) PFDP completed the survey. There are 158 (98%) PFDP who routinely document both mechanism of injury and injured areas of the body for those patients who have sustained an injury. Also, 152 (94%) PFDP report that they routinely document circumstances of injury. Only 53 (33%) PFDP routinely inform their patients how to modify injury risk behaviors and only 31 (19%) routinely provide instruction about proper use of safety or protective devices. Sixty-seven (41%) PFDP always refer to a motor vehicle collision in either verbal or written communication as an accident, rather than a crash or collision.

Reportedly, 114 PFDP (70%) believe PIP education should be a core mission of EMS systems and 130 (82%) feel that PIP should be implemented at the local or regional level. However, 60 (37%) PFDP state that they were not given any PIP education in their initial para-

medic class. There were 101 (67%) PFDP who never participated in a community PIP project and only 17 (11%) routinely educate their peers about PIP.

DISCUSSION

In the United States, education of out-of-hospital emergency care providers has been driven by nationally accepted guidelines since the mid-to-late 1960s. During this period, the focus of medical interventions for victims of acute trauma has been treatment necessary for the consequences of the injury and for the prevention of further injury. This model of injury care is predominantly a reactive one. Once an injury occurs, the EMS system is activated and emergency resources are dispatched to the scene. Treatment is rendered and the patient is either transported to a definitive care facility or declines transport.

Absent from this model is any mention of patient feedback relative to injury prevention education. It is believed that many traumatic injuries could be prevented by accurate risk perception and knowledge of injury prevention. Presumably, injured patients armed with such information would seek to prevent the occurrence of similar traumatic injuries in the future. The results of our survey indicate that patient feedback about injury risk reduction is uncommon. Despite the fact that information is routinely gathered by PFDPs that may lead them to assess the possible causes of injury, less than one-third of surveyed paramedics routinely speak with their patients about why they were injured or how to avoid such an injury in the future. Furthermore, the fact that many PFDPs still refer to a motor vehicle collision as an accident would seem to indicate that little injury prevention information has been disseminated to this group.

EMS providers seem especially qualified to educate patients about the prevention of traumatic injuries for several reasons. The communities in which they work consider them highly credible (4). They are disseminated throughout the community and treat many patients who have sustained such injuries. They also have a unique exposure to the living conditions and patterns of injury present in a given community (4).

Almost all of the paramedics we surveyed indicated that they routinely record key variables related to development of traumatic injuries, including mechanism and circumstances of the injury, in addition to the specific injuries themselves. Availability of such data is crucial if recommendations are to be made concerning how such an injury can be prevented in the future. Many injured patients transported by EMS are not severely injured and do not require significant medical interventions during

transport. Perhaps this phase of the EMS call could best be utilized by supplying injury prevention information to the patient.

The EMS providers we surveyed believe that injury prevention is important for their safety and for the safety of the community. Nonetheless, the majority neither educate the community nor their own peers about injury prevention practices or even appropriate use of commonly available safety devices. This may be partially explained by the fact that a significant minority report that they were not given any education regarding injury prevention in their initial paramedic training. It is also possible that EMS providers expect Emergency Department staff or other medical personnel to provide information to patients regarding PIP.

Much of the reason that EMS providers are not more aware of the importance of PIP stems from the lack of recognition of this fact nationwide. Only in the last 5–7 years has there been a national call for EMS involvement in PIP activities (2,4,10). Garrison et al. have cited a need for the creation of a culture of health promotion and safety through PIP initiatives in a consensus paper on the role of EMS systems and injury prevention (4). O'Connor et al. have urged aggressive physician medical oversight of PIP in public and EMS workplaces (10).

The strongest advocate for PIP in EMS systems is The National Highway Traffic Safety Administration's EMS Agenda for the Future (2). This blueprint for the next generation of EMS envisions the EMS provider as someone who can identify and modify illness and injury risks. It also proposes better identification of community health and safety issues, maintenance of a "prevention-oriented atmosphere within EMS systems," integration of prevention principles into EMS education, and participation in community-based efforts for injury prevention at the local, state and national levels. To this end, an injury prevention module has been created for the new National Registry EMT-Paramedic curriculum (11).

The major limitation of this study is selection bias. The paramedics surveyed all work in a single, large EMS system. We also included EMS administrators within our survey population. These administrators generally have more years of EMS experience, although their current clinical responsibilities are much less than the average field provider. It is unclear if the characteristics of our study group differ from that of the overall population of EMS providers. The scope of this study did not include evaluation of EMS provider educational background or duration of practice, both of which may affect their practice and beliefs regarding PIP. It is also unclear whether these characteristics may affect an individual's knowledge and beliefs about PIP. Recall bias may also affect the outcome of this study, because we did not match survey answers with EMS patient care reports to

determine the frequency with which PFDPs document injury characteristics.

This study raises several important questions that should be addressed as a national PIP curriculum for EMS providers undergoes implementation. What are the core philosophies that should be taught to all EMS providers regarding PIP? What means of PIP education are most appropriate and most easily delivered by EMS personnel? How much initial PIP education and continuing education is necessary for EMS providers to deliver such information to the public and are there differences among the different levels of EMS providers? How effective will PIP campaigns be when mounted on a local level, as preferred by our survey participants, compared to a national level? Would patients with painful but not life-threatening injuries be receptive to PIP education, and how effective would it be in these circumstances? Finally, what are the measurable parameters that will define the success or failure of EMS PIP efforts in the community?

CONCLUSIONS

Primary injury prevention will play an essential role in the EMS systems of the future. EMS providers in our urban study population believe that primary injury prevention should be a routine part of their daily practice. However, many have not received any formal PIP education and few practice PIP during the delivery of emergency services in the field.

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