Partnering With Patients to Reduce Firearm-Related Death and Injury

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In the United States, nearly 40,000 deaths per year are firearm related. Among these fatalities are approximately 1300 children. In addition, there are more than 20,000 unintentional firearm injuries per year. Osteopathic physicians have a unique opportunity to affect this public health concern through patient education. Several evidenced-based recommendations can be incorporated at the bedside to reduce firearm injuries and deaths, including gun education, safe storage, and proper disposal.

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In 2017, more than 39,773 people in the United States died due to firearms,¹ surpassing the number of people who died from motor vehicle crashes the same year.² The Centers for Disease Control and Prevention reported over 113,000 nonfatal firearm injuries, 20,400 of which were unintentional, in the same year (Figure).¹ Close to 1300 children are fatally shot each year, and almost 5800 children survive gunshot wounds.³ These statistics are associated with \$2.8 billion dollars in annual financial burden from initial emergency department and inpatient health care charges alone.⁴

The majority of people in the United States cite personal protection as the reason they own a firearm.⁵ The violent crime rate in the United States stands at nearly 1.25 million events per year, which likely contributes to this reason for gun ownership.⁶ A 2014 study showed that access to firearms has an odds ratio (OR) of 2.00 (95% CI, 1.56-3.02) for homicide. In the same study, suicide had an OR of 3.24 (95% CI, 2.41-4.40) when there was access to a firearm.⁷ Compared with other methods of attempted suicide, firearms remain the most lethal method, with 85% of attempts resulting in death compared with less than 5% by other methods.⁸

With these statistics on injury, death, and health care expenditure, it is important that physicians consider partnering with their patients to reduce firearm-related death and injury. Data and research provide guidance to physicians on methods that can be incorporated at the bedside to combat this public health problem. Physicians must be empowered with information to be effective, while respecting the Second Amendment protections of gun ownership. In a recent poll, this freedom guaranteed under the Bill of Rights of the US Constitution was reported as essential by 74% of gun owners.⁵ The American Medical Association addresses the role of physicians in firearm injury prevention through physician and patient education as well as steps to reduce harm.⁹ Osteopathic physicians promote wellness through the tenet of the body unit: body, mind, and spirit. Educating patients and their families on firearm safety empowers the

Figure.

Centers for Disease Control and Prevention report of US firearm injuries and deaths in 2017.

mind to prevent injury to the body. In this review, information about firearm safety has been compiled to aid with this effort.

Children and Firearms

An estimated 4.6 million children live with loaded, unlocked guns in their homes.¹⁰ One in 3 handguns are kept loaded and unlocked. Most children, when asked, know where their parents store their firearms, and 36% of children report handling these guns.¹¹ Among unintentional shootings, 89% occur at home.¹² More than double of these incidents occurring at home involve children between the ages of 0 to 12 years.³

About 38% of gun-related children deaths are related to suicide; another 6% are unintentional (accidental from improper handling or playing with what was believed to be a toy).³

In states and regions with increased gun availability, deaths from firearms among children are higher than in those states with less availability.^{12,13} Prevention of such injuries and deaths can be aided with proper safety measures, such as safe storage and proper disposal of unwanted firearms. Physicians aware of these preventive measures can be a cornerstone in educating patients and families regarding basic gun safety and risk reduction.

Firearm Storage

The mere presence of a gun in a household increases a person's risk of suicide (OR, 3.44; 95% CI, 3.06-3.86) and homicide (OR, 1.72; 95% CI, 1.40-2.12) by firearm.^{14,15} Several states have child access prevention (CAP) laws that mandate gun storage in a manner that prevents easy access by a child or teenager. A 23% decrease in unintentional shootings among children younger than 15 years was seen in states that placed CAP laws in effect.¹⁶ When examining the storage of firearms, a 2018 national survey¹⁷ of US gun owners demonstrated that about 24% report storing all their guns in an unlocked location, and only 24% of those reported using a trigger lock. The most common factors influencing gun storage practices were concerns about home defense, gun safety training courses, family discussions, and gun safety training from a family member. Gun owners most commonly identified law enforcement officers, hunting/outdoor groups, active duty military, and the National Rifle Association as the most effective communicators regarding gun storage practices. This research found that physicians were seen as the least effective.¹⁷ However, Albright and Buraige¹⁸ demonstrated a positive effect from office counseling by family physicians regarding gun safety practices. This intervention yielded a 3-fold increase in safety changes after the intervention compared with a no counseling

control group. Becher et al¹⁹ examined physician firearm ownership as a predictor of physician counseling for patients about firearm injury prevention. They found that internists and surgeons who own firearms are more likely to counsel patients about firearm safety.

When comparing the storage practices in households that contained a firearm in the presence of a child or person younger than 20 years, 4 practices were associated with lower risk of both suicide or unintentional injury: (1) firearm locked away in a lockbox or safe, (2) firearm kept unloaded, (3) locked storage of the ammunition, and (4) storage of ammunition separate from firearm.²⁰ Another study²¹ also estimated that 31% of accidental firearm deaths could be prevented with the addition of child-proof safety locks and an indicator that the firearm is loaded. Programs that provide community counseling and education, such as “Love Your Kids, Lock Your Guns,” have demonstrated a 3-fold increase in safe gun storage.²² Storage practices such as guns stored locked, unloaded, or both reduced suicide by firearm (locked: OR, 0.39; 95% CI, 0.24-0.66; unloaded: OR, 0.30; 95% CI, 0.18-0.49).¹⁵ Following safe storage practices for both firearms and ammunition can prevent injury and death to children in the household. In an effort to reduce firearm injury and death, physicians - likely those in the primary care setting - should screen for firearm storage risks and educate patients on safe practices.⁹

New technologies have resulted in the development of electronic gunlocks. These locks ensure that only authorized users can fire the weapon; whether through radiofrequency identification or biometric scanning. Interest level in this emerging technology was studied and found that only a modest number of current gun owners were interested in purchasing such technology.²³ Among study participants, those interested in personalized guns appeared more safety conscious in their current storage methods. Thus, the benefit may be limited.

Temporary Storage

In the event that an individual already has a household firearm and is developing risk factors for self-harm or

suicide, temporary gun storage at either local law enforcement agencies or gun retailers can reduce injuries. Temporary storage may also be used when an owner travels out of town or when visitors, particularly children, are in the home. Questionnaires were sent to various law enforcement agencies and retailers in 8 US states.²⁴ The results showed that 74.8% of law enforcement agencies and 47.6% of gun retailers provided temporary storage of firearms when a household member was in crisis or had risks of suicidal ideation. Law enforcement agencies were more likely to provide storage when there was concern for mental instability in a family or household member, whereas gun retailers were more likely to store firearms for households that were planning to travel or were expecting visitors such as children.²⁴ Counseling patients and family members on this option can assist in the prevention of both suicidal or unintentional firearm injuries.

Firearm Education and Training

Just as driver's education aims to improve a person's knowledge of the road and safe driving, firearm education and training provides information on safe firearm ownership practice. Several states require safety training for possession or purchase of a firearm.²⁵ Topics covered in the courses include information on firearm anatomy and operation, safe gun handling, safe storage, suicide, relevant laws, theft prevention and reporting, self-defense, and firearm information related to children. Hemenway et al²⁶ examined the topics taught in firearm training in various classes in 7 northeastern states. Their results showed variability in the topics covered, with only 10% covering suicide prevention or domestic violence. Encouraging firearm owners to attend a training and safety course may provide firearm owners a review of important safety topics or new knowledge.

Proper Disposal of Firearms

When ownership of a firearm is no longer desired, proper disposal is important. Gun buyback programs

aim to remove these firearms from the circulation. A robust buyback program in Massachusetts has shown that the effort not only reduced available firearms but raised community awareness about firearm risk.²⁷ A Connecticut program surveyed persons who participated in a buyback program and found that the demographics of those relinquishing firearms were similar to those that committed suicide in relation to age, gender, and race.²⁸ The authors concluded that buyback programs constituted a viable approach to remove unwanted handguns from the community and the homes of individuals at increased risk of suicide.²⁸ Physicians' knowledge of buyback programs in a community can provide an opportunity to educate patients on this resource.

Conclusion

Firearm injuries and deaths are devastating, and they are costly to the health care system. Osteopathic physicians are charged with optimizing patients' health and educating patients on preventive medicine. Regardless of where a physician stands in respect to firearm policy, it is important to recognize risk factors for injury and death from firearms. It is an honor to partner with our patients and their household contacts in raising awareness of firearm safety measures while respecting their firearm rights. Working together, we can increase responsible practices and prevent firearm related incidents.

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