

In the Clinic®

Preventing Firearm-Related Death and Injury

Deaths and injuries from firearms are significant public health problems, and clinicians are in a unique position to identify risk among their patients and discuss the importance of safe firearm practices. Although clinicians may be ill-prepared to engage in such discussions, an adequate body of evidence is available for support, and patients are generally receptive to this type of discussion with their physician. Here, we provide an overview of existing research and recommended strategies for counseling and intervention to reduce firearm-related death and injury.

CME/MOC activity available at [Annals.org](https://annals.org).

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Epidemiology

Health Benefits, Harms,
and Risk Groups

Screening

Prevention

Practice Improvement

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Epidemiology

Firearm-related death and injury are significant public health problems in the United States. From 2008 to 2017 (the 10 most recent years for which data are available), there were 342 439 firearm-related deaths in the United States—more civilian deaths from gunshot wounds than from U.S. combat fatalities in World War II—and another estimated 870 000 nonfatal firearm-related injuries. In 2015, for the first time in U.S. history, the age-adjusted firearm-related mortality rate surpassed that related to motor vehicle traffic events (1). The firearm-related suicide rate has increased each year since 2006; firearm-related homicide trended downward from 2006 to 2014 but has since increased (1).

Among industrialized nations, the United States has uniquely high rates of firearm violence. The firearm homicide rate is more than 25 times that of comparable countries, and the firearm suicide rate is 8 times higher (2). The annual total cost of firearm-related death and injury in the United States was estimated at \$229 billion for 2012; this includes direct costs of health care and emergency services and indirect costs, such as lost income from victims and caregivers (3). The case-fatality rate for firearm-related injuries has not declined since the early 2000s, and lengths

Risk for firearm-related homicide is highest for adolescents and young adults and decreases thereafter. Overall, suicide risk increases with age (**Figure 1**). Firearm-related homicide and suicide rank among the 10 leading causes of death for Americans for most of the lifespan (**Figure 2**). However, there are profound differences in rates of

of stay and hospitalization costs have increased (4).

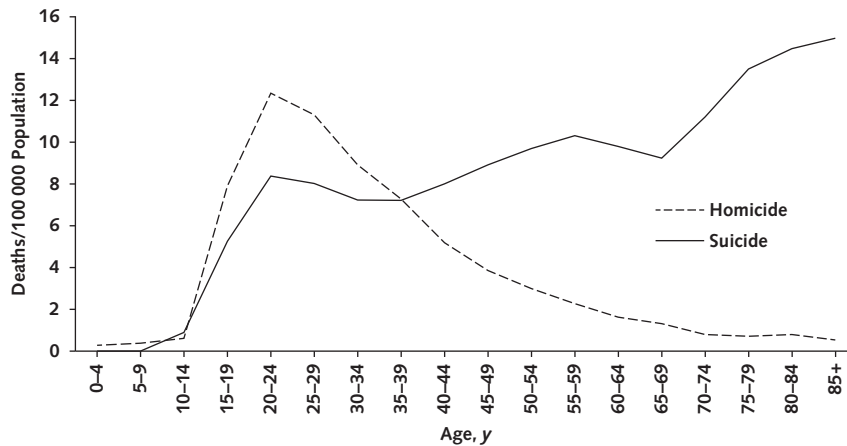
Public mass shootings command the nation's attention and are changing the character of American public life. However, they account for no more than 1% to 2% of firearm-related deaths and for less than half of all mass shootings.

Clinicians have unique opportunities to prevent all types of firearm-related death and injury—suicide, homicide, unintentional injury, mass violence—through their relationships and interactions with patients. The primary purpose of this article is to aid clinicians in assessing a patient's risk for firearm injury or death, counseling on firearm safety when appropriate, and intervening in emergency situations. These activities generally involve a patient who already owns or has access to firearms, but much of what we present is applicable to counseling a patient who does not have a firearm and is considering whether to acquire one.

The effort to impede research on firearm violence and prevention has been sustained and often successful (5); as a result, the recommendations made here may not rest on the substantial foundation of scientific evidence that underlies other In the Clinic contributions. Interpretations and recommendations that rely on expert opinion are clearly indicated.

firearm mortality by sex and race/ethnicity. Homicide risk is concentrated among young African American men: Nearly 90% of firearm deaths among African American men are homicides. Suicide risk is highest among middle-aged and older white non-Hispanic men: Nearly 90% of firearm deaths among white men are suicides (**Figure 3**).

Figure 1. Firearm suicide and homicide rates, by age, 2017.



Data from reference 1.

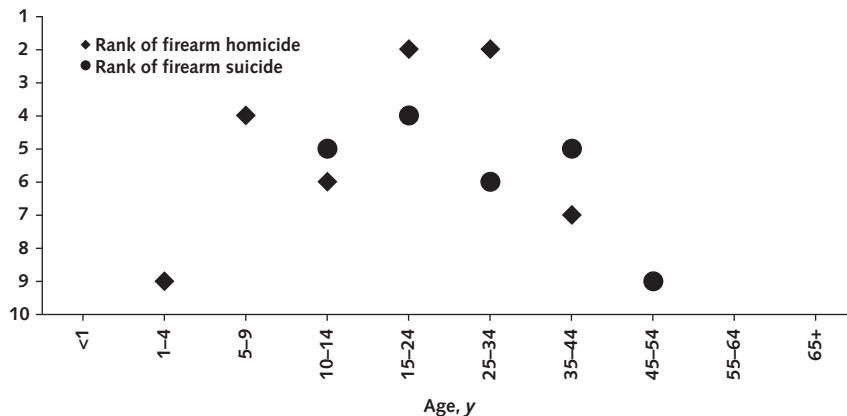
Firearm death rates for women are approximately 10% of those for men, and suicide rates for women decrease with age. About half of homicides in the United States that involve a female victim (3986 in 2017) are committed by intimate partners, and about half of female intimate partner homicides are committed with a firearm (1, 6).

Approximately 60% of all firearm-related deaths are suicides; conversely, firearms are the means of death for approximately half of all suicides nationwide (51% in 2017), with higher rates of fire-

arm suicide death in some states (1). Among veterans, who are at increased risk for suicide, more than 75% involve firearms (7). As many as 90% of suicide attempts with a firearm result in death (8). Approximately one third of all firearm-related deaths are homicides, and most homicides are due to firearm injury (75% in 2017) (1).

Firearm mortality in the United States varies geographically. Homicide rates are highest in the South, and suicide rates are highest in the Intermountain West (Figure 4). Death rates also differ

Figure 2. Ranking for firearm-related suicide and homicide among all causes of death, by age, 2017.



From reference 1. Causes of death were calculated by separating homicides by firearm from homicides by all other mechanisms and suicides by firearm from suicides by all other mechanisms.

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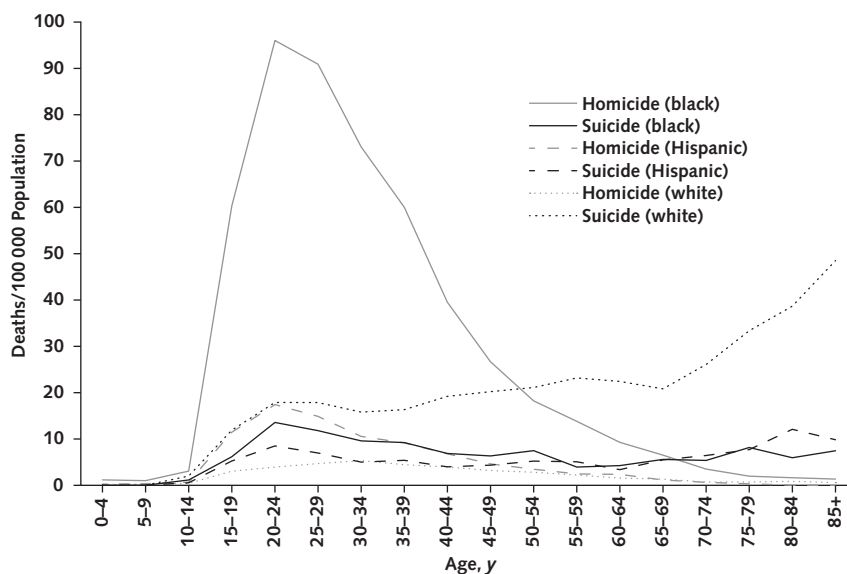
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Figure 3. Firearm mortality rate in males, by type and race, 2017.



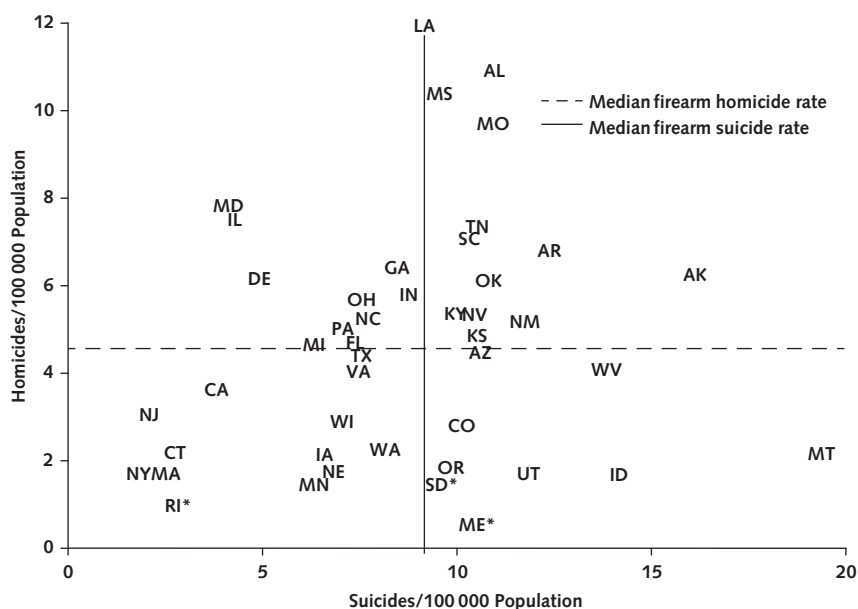
Data from reference 1.

between urban and rural areas within states. Urban areas have higher rates of firearm homicide, whereas rural areas have higher rates of firearm suicide (9).

There are an estimated 265 million civilian-owned firearms in

the United States (10). Approximately 22% of U.S. adults own firearms, and the median state-level prevalence of firearms in the home is 40.8% (10, 11). Firearm owners are disproportionately male, white, middle-aged or older, and residents of non-

Figure 4. Age-adjusted firearm suicide and homicide rates, by state, 2017.



Data from reference 1. Hawaii, New Hampshire, North Dakota, Vermont, and Wyoming have suppressed firearm homicide rates. * Unstable value for rate of firearm homicide.

urban areas (10). Eight percent of owners own 10 or more firearms; this accounts for nearly 40% of the firearms in the United States (10). At the popu-

lation level, the prevalence of ownership is strongly associated with rates of firearm-related homicide, suicide, and unintentional death (12–14).

Health Benefits, Harms, and Risk Groups

Why do people own firearms?

Americans own firearms for several reasons, chiefly to protect themselves from other people (63%) and for hunting (40%) and other sporting uses (28%) (10). Veteran populations cite similar reasons (15). Larger proportions of women (73%), Southerners (69%), and persons who own only handguns (78% of those who own 1 and 83% of those who own >1) report owning firearms for protection against people (10). An estimated 8% of Americans own firearms for their jobs (16).

What are the risks associated with access?

Most households with firearms do not experience injury or death in a given year. However, a firearm in the home is an independent risk factor for injury or death, and risk remains elevated, although to a lesser degree, even when they are stored safely.

When a firearm is in the home, all members of the household are at increased risk for homicide, suicide, and unintentional injury. A 2014 meta-analysis calculated pooled odds ratios of 3.24 for suicide and 2.00 for homicide victimization for persons with firearms in the home (17).

Several case-control studies have examined risk for firearm-related death associated with the presence of a firearm in the home (**Appendix Figure** and **Appendix Table 1**, available at [Annals.org](https://www.annals.org)) (17).

One large-scale cohort study focused on risk to handgun purchasers (18). In the first week of possession, suicide risk increased more than 50-fold; it remained elevated, although progressively less so, through 5 years of follow-

up. For women who purchased handguns, the leading cause of death in the ensuing year was firearm suicide. Risk for homicide victimization was increased among women, but not men, who purchased handguns.

Risk for unintentional death by firearm is also elevated in households with firearms. The magnitude of increase is related to the number of firearms in the home (19).

What are safer storage practices? Do they reduce risk?

Following Grossman and colleagues (20), we define safer storage to mean that firearms are stored unloaded and locked (either fitted with a locking device or secured in a locked container) and that ammunition is stored separately and also locked. In the 2015 National Firearms Survey, 46% of firearm owners reported safely storing all guns. However, 30% of firearm owners store at least 1 firearm loaded and unloaded, 25% store all weapons unloaded and locked, and 46% store their firearms either locked and loaded or unlocked and unloaded (unpublished data provided by the authors) (10).

Approximately 20% of homes with children have guns stored in the least safe manner and 30% have guns stored in the safest manner, suggesting that safer storage is slightly more common among households with children than those without (21). Nonetheless, 6% to 8% of children (approximately 4.6 million) in the United States live in homes with firearms stored unlocked and loaded (21). Persons who own 5 or more firearms, those whose

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storage is influenced by concerns about home security, and those who are older might be less likely to store their firearms safely (22). Unsafe storage is associated with other risk factors for firearm-related death and injury, such as frequent and heavy alcohol use (23).

Not surprisingly, unsafe firearm storage practices are associated with adverse outcomes. Risk for suicide among persons living in homes with firearms is higher if the weapons are stored loaded and unlocked (24, 25). A case-control study found that firearms used in suicide attempts or those causing unintentional injury were

less likely than others to be stored safely (20). Hazards associated with unsupervised access by children and adolescents, presumably a result of unsafe storage, have been well documented. A review of school shootings from 1990 through 2017 in which 3 or more people were killed found that, in cases where information about the source of the firearms used was known, 85% of the shooters obtained them from home (26). In a series of 44 adolescent suicides with a known firearm source, 82% of the weapons were owned by a parent or family member of the deceased (27).

Screening

What do clinicians see as their role in preventing firearm injury?

Although clinicians often feel it is within their responsibilities to discuss firearms with patients, they do so infrequently. Across many specialties, including internal medicine, surgery, and pediatrics, more than 70% believe that physicians should have a role in firearm injury prevention, but fewer than half report ever discussing firearms with patients (28, 29). In a 1995 study, only 12% of family physicians and 25% of pediatricians reported counseling more than 5% of their patients about firearms (30). A 2000 survey of pediatricians nationwide found that 68.8% sometimes or always ask about firearms in the home and 72.8% sometimes or always recommend that firearms be stored unloaded and locked up (31). Physicians who own firearms are more likely to report counseling patients in their practices (32).

What are the barriers to discussion?

Lack of time and competing clinical priorities are commonly cited as barriers to discussing firearms with patients. Others include lack of basic knowledge about firearms and the specifics of firearm-related injury prevention, insufficient training about how to discuss firearms with patients, uncertainty about the effectiveness of counseling, and concern over whether patients regard them as credible sources of information (30, 33). Some worry that such counseling may negatively affect the physician-patient relationship (34).

Clinicians may diminish their own ability to effectively counsel by overestimating their skills in determining who does or does not own a firearm (32). This may lead to failure to counsel some high-risk persons.

Should screening be risk-based or universal?

Risk-based screening is most feasible and relevant to patients' health and safety. In settings where many or most patients are at increased risk (discussed later), universal screening may be the

best approach. It is important to remember that neither risk nor access to firearms is static. Risk may change with the circumstances and health status of household members, and access should be reassessed if risk increases (35).

Three categories of persons are at increased risk for firearm-related death and injury: those displaying behaviors that signal acute risk for harm to themselves or others, those with individual characteristics suggesting increased risk for firearm violence, and those belonging to demographic groups that are at increased risk (36).

Acute risk

Patients who have acute suicidal or homicidal ideation or intent are uncommon in most clinical settings (about 4% of U.S. adults have had suicidal ideation in the past 12 months, and 0.6% have attempted suicide) but present a true emergency (37). A discussion of access to lethal means generally, and firearms specifically, is an essential part of the assessment and treatment of these patients.

Individual risk characteristics

Individual risk characteristics for experiencing or causing firearm-related injury or death include alcohol and other substance misuse, a history of violent behavior or victimization, dementia or another form of impaired cognition, and serious and poorly controlled mental illness. Patients may see clinicians for reasons directly related to these risk factors.

The prevalence of firearm ownership in patients with these risk factors is similar to that of the general population, except for those with a history of suicide attempt, who are less likely to own firearms. (36). Firearm ownership is associated with an in-

creased prevalence of alcohol risk behaviors, such as binge drinking or drinking and driving (38). As many as 60% of people with dementia in the United States live in a home with a firearm, which is stored loaded in nearly half of those homes (16, 39).

Risk associated with some of these individual characteristics is high. For example, among legal purchasers of handguns, those with prior convictions for violent crimes are 10 to 15 times as likely as those with no criminal history to be subsequently arrested for violent and firearm-related crimes (40). Persons who have been hospitalized for a firearm-related injury are much more likely to experience firearm-related arrest or violence (standardized hazard ratio [sHR], 2.7 [95% CI, 2.0 to 3.5]), subsequent injury (sHR, 21.2 [CI, 7.0 to 64.0]), or death (sHR, 4.3 [CI, 1.3 to 14.1]) (41).

Contrary to common belief, only 4% to 5% of interpersonal violence is primarily attributable to diagnosed mental illness (42). There are times throughout the clinical course of a mental illness when injury risk is increased: at initial diagnosis, before stabilization is achieved; in times of exacerbation (such as those requiring psychiatric hospitalizations); and in times off medication for patients who require medication. Psychiatric disorders (primarily depression, but also bipolar disorder and other conditions) are associated with 45% to 75% of suicides, which account for most U.S. firearm deaths (42).

Patients with abusive partners are also at risk. Prior domestic violence and firearms in the home each independently increase risk for homicide in the home committed by a spouse, intimate partner, or close relative (43).

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67. Forbis SG, McAllister TR, Monk SM, Schlorman CA, Stolli A, Pascoe JM. Children and firearms in the home: a Southwestern Ohio Ambulatory Research Network (SOARNET) study. *J Am Board Fam Med.* 2007;20:385-91. [PMID: 17615419]
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69. Coyne-Beasley T, Bacca-gliani L, Johnson RM, Webster B, Wiebe DJ. Do partners with children know about firearms in their home? Evidence of a gender gap and implications for practitioners. *Pediatrics.* 2005;115:e662-7. [PMID: 15930193]

Firearms are frequently used to maintain control in abusive relationships, such as by threatening partners (44). When violent partners have firearm access, the severity and likelihood of fatality resulting from intimate partner violence increase, although not necessarily due to use of firearms (45).

Firearm access for patients with dementia is dangerous for both the patient and caretakers (46). Experts and researchers are now drawing an analogy between access to firearms and driving among elderly persons, urging clinicians and families to consider that the "memory, thinking, and judgment as well as physical and

behavioral competence issues related to an elderly person's safe operation of a motor vehicle apply to firearms" (47, 48).

Demographic groups

High risk for homicide among young black and Hispanic men and for suicide among older white non-Hispanic men were discussed previously. Children are at elevated risk for experiencing or causing unintentional injury or death when a firearm is in the home. Parents often underestimate or are unaware of children's access to and use of firearms (28, 49, 50). Safety programs for children do not decrease their likelihood of handling firearms when unsupervised (50).

Screening... Although clinicians often feel that discussing firearms is within their responsibilities, they do so infrequently. Barriers include time pressure and lack of knowledge. Identifiable risk groups include persons at acute risk (those with suicidal or homicidal ideation), those with individual risk characteristics (including alcohol or drug misuse, history of violence, or dementia or other cognitive impairment), and those belonging to an at-risk demographic group (young men of color for homicide, children for unintentional injury, and older white men for suicide). Adult populations at increased risk have rates of firearm ownership similar to that of the general population. Identifying patients with risk factors allows clinicians to target their interventions.

CLINICAL BOTTOM LINE

Prevention

Is discussion of firearms legal?

No state statutes prohibit clinicians from discussing firearms with patients or documenting such discussions (36). A Florida statute widely understood to contain such prohibitions included a broad exemption for cases in which the physician "in good faith believes that this information is relevant to the patient's medical care or safety, or the safety of others." The statute's provisions regulating discussions about firearms have been struck down on First Amendment grounds by the United States

Court of Appeals for the 11th Circuit (51).

The Patient Protection and Affordable Care Act prohibits *required* collection of information on lawful firearm ownership, possession, or use by federally funded wellness and prevention programs (52). Clinicians in the military may not routinely collect information on firearms privately owned by members of the Armed Forces or civilian employees of the Department of Defense, but may do so when there is concern related to risk for harm to self or others (53).

What is the evidence that discussions are effective in preventing injuries?

Clinician counseling can significantly increase safer firearm storage (54–56). Interventions that distribute safety devices in conjunction with counseling may be the most promising method for changing storage behaviors (57). Counseling to remove a firearm from the home is less effective (28). Selected studies of the effectiveness of counseling and safer storage are summarized in **Appendix Table 2** (available at [Annals.org](https://www.annals.org)). Two recent review articles present this information in more detail (57, 58).

What language is appropriate in discussing firearms with patients?

Effective firearm counseling requires a working understanding of the varied cultures and beliefs of firearm owners (59, 60). Recommendations for safer storage, particularly a recommendation that firearms not be kept in the home, may conflict with deeply held beliefs and practices that are widespread in the patient's community. We suggest that language used in the discussion should convey not only understanding of why people own firearms but also respect for the patient's decision to do so. It is important to articulate why the discussion is relevant to the patient's (or another person's) health and safety by linking it to the risk factors discussed earlier. The focus should remain on the physician's and patient's shared interest in preventing harm.

We and others have suggested several general guidelines for discussing firearms with patients. A normalizing opening phrase, such as "Many families keep guns in the home," may make patients more amenable to talking about firearm access and safety (60,

61). (The terms "gun" and "firearm" are often used interchangeably, although "gun" includes items that are not firearms, such as air guns.)

When discussing options for reducing firearm access, clinicians should avoid using such words as "restrict," "surrender," "seize," "dispossess," and "confiscate," which may be perceived as threatening (62). Preferred terms include "recover," "hold for safekeeping," "let someone else keep," "keep safe," or "transfer custody," which reinforce the point that the goal is to reduce risk. If appropriate, clinicians can emphasize that the transfer may be temporary; "babysit" might work well in that situation.

If a patient declines to engage in a discussion about firearm access, the clinician can use techniques that are helpful in counseling about other sensitive issues. These include respectfully emphasizing why the discussion of firearm access is relevant, discussing the goals of risk assessment and reduction, reframing the question, and asking patients why they prefer not to answer. Unless risk for harm to the patient or someone else is imminent, the clinician may simply plan to ask again at the patient's next visit. If the clinician believes a patient is at acute risk, refusal to answer may confirm this belief. Regardless of the response, clinicians should never castigate patients for refusing to answer questions about firearm access. Stigmatizing language should be avoided in any discussion about firearms or related subjects, such as mental illness.

How do patients regard physician-initiated discussions about firearms?

A 2016 survey found that 70% of gun owners reported feeling at least somewhat comfortable

70. Betz ME, Knoepke CE, Siry B, Clement A, Azrael D, Ernestus S, et al. 'Lock to Live': development of a firearm storage decision aid to enhance lethal means counselling and prevent suicide. *Inj Prev*. 2018. [PMID: 30317220]
71. 45 C.F.R. §164.512 1996.
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74. Giffords Law Center to Prevent Gun Violence. Extreme Risk Protection Orders. San Francisco: Giffords Law Center to Prevent Gun Violence; 2018. Accessed at <https://lawcenter.giffords.org/gun-laws/policy-areas/who-can-have-a-gun/extreme-risk-protection-orders/#state> on 15 January 2019.
75. Swanson JW, Norko MA, Lin HJ, et al. Implementation and effectiveness of Connecticut's risk-based gun removal law: does it prevent suicides? *Law Contemp Probl*. 2017;80:179-208.
76. Kivisto AJ, Phalen PL. Effects of risk-based firearm seizure laws in Connecticut and Indiana on suicide rates, 1981-2015. *Psychiatr Serv*. 2018;69:855-62.
77. Mental health professionals' duty to warn. National Conference of State Legislatures. 2018. Accessed at www.ncsl.org/research/health/mental-health-professionals-duty-to-warn.aspx on 5 April 2019.
78. Singh JP, Fazel S, Gueorguieva R, Buchanan A. Rates of violence in patients classified as high risk by structured risk assessment instruments. *Br J Psychiatry*. 2014;204:180-7. [PMID: 24590974]
79. Weinberger SE, Hoyt DB, Lawrence HC 3rd, Levin S, Henley DE, Alden ER, et al. Firearm-related injury and death in the United States: a call to action from 8 health professional organizations and the American Bar Association. *Ann Intern Med*. 2015;162:513-6. [PMID: 25706470]

disclosing ownership to their physicians if asked (63). Patient perceptions of appropriateness may vary among firearm owners, nonowners in firearm-owning households, and those who do not live in households with firearms (64). Patients may be more receptive to questions about firearm access when risk has been discussed.

However, patients may believe clinicians are less credible sources of advice on firearm safety than are representatives of such organizations as the military, law enforcement, or the National Rifle Association (22). Patient concerns about credibility are reasonable; many clinicians neither own nor have experience with firearms, and medical education does not adequately address prevention of firearm-related death and injury. Self-study may be appropriate to develop sufficient knowledge of risks and benefits and of specific options for safer storage. Many resources are listed in the Tool Kit; firearm-owning and other knowledgeable clinicians can also serve as resources (60).

A desire to keep information about ownership out of the medical record may fuel patient hesitation to discuss firearms (65). Specifically, patients may be averse to conversations that include details on the number of firearms owned and where in the home they are kept; however, these details are often unnecessary (59). Some patients may simply believe that discussions of firearm practices are not within the scope of a clinician's responsibility (66, 67).

How should a clinician start the conversation?

If a patient, someone else in the home, or a regular visitor (such as a child or grandchild) is in 1 of the 3 at-risk categories men-

tioned earlier, discussing access to firearms is appropriate. Having identified increased risk, a clinician might proceed by saying, "In situations like this, I think about safety and need to be concerned about ways an injury could happen, including access to weapons. So, for example, are there any firearms in or around your home?" The clinician could also just assume there is access to firearms: "Tell me about the firearms in your home." Patients may also present with concerns about someone outside the home, such as a relative or abusive partner, and these examples can easily be modified for such circumstances.

Clinicians may find the "5 Ls" mnemonic to be useful (68). If there is a firearm in the home, is it Loaded? Is it Locked? Are Little children ever in the home? Is anyone with access feeling Low? Is the operator Learned? Here, "learned" refers both to knowledge about firearms and to the possibility of cognitive impairment. This mnemonic has not been validated but in our experience has been helpful.

How should patients with firearms in the home be counseled?

In the absence of acute and extreme risk, clinicians should recommend that patients with firearms in the home store them unloaded, locked up, and separated from ammunition. Keys or combinations to locking devices should be kept out of reach of persons who should not have access (36).

Determining who in the patient's home is the owner of the firearm may guide the clinician's approach to ensuring safer storage practices. For example, in 1 study of couples, 88% of men and 83% of women reported that storage decisions were the responsibility of the husband (69). If the at-risk person lives in a household with a firearm but is not the owner, a clinician can promote and support firearm safety conversations between household members

80. Butkus R, Doherty R, Bornstein SS; Health and Public Policy Committee of the American College of Physicians. Reducing firearm injuries and deaths in the United States: a position paper from the American College of Physicians. *Ann Intern Med.* 2018;169:704-7. [PMID: 30383132]
81. AAST statement on firearm injury. *J Trauma Acute Care Surg.* 2018; 85:426. [PMID: 29985238]
82. Talley CL, Campbell BT, Jenkins DH, Barnes SL, Sidwell RA, Timmerman G, et al. Recommendations from the American College of Surgeons Committee on Trauma's Firearm Strategy Team (FAST) Workgroup: Chicago Consensus I. *J Am Coll Surg.* 2019;228:198-206. [PMID: 30447396]
83. Gilchick RA. Report of the Council on Science and Public Health: The Physician's Role in Firearm Safety. Chicago: American Medical Association; 2018. Accessed at www.ama-assn.org/sites/ama-assn.org/files/corp/media-browser/premium/csaph/physician-role-firearm-safety.pdf on 5 April 2019.

(for example, the patient or the patient's primary caretaker) and the firearm owner.

We recommend that the discussion encompass a variety of safe storage options to allow patients to consider what is most appropriate and feasible in their homes (60). Options include locking devices, lock boxes (including biometric ones), and firearm safes (**Figure 5**). Knowing where patients can purchase or otherwise obtain these devices is helpful.

The most appropriate method of safer storage of firearms may vary with firearm type and intended use. For example, if a patient owns a firearm for self-protection, he or she might prefer a safer storage method that allows for quick access, such as a biometric safe. Clinicians should discuss safer storage options with these factors in mind and approach the topic as an exercise in patient-centered decision making.

Conversations may extend to how to address firearms and safer storage in other homes (for example, where the patient's children spend time) and where to learn more about local firearm laws. If a patient is concerned about access by someone who lives elsewhere, the clinician can provide information and help develop a best approach to addressing access with the at-risk person.

Decision aids may be helpful. One promising avenue for the future is the development of firearm decision aids to help elderly persons make the best storage decisions for their specific needs. One such tool, recently developed for persons who have or may develop cognitive impairment and their caregivers, has high user acceptability. If pilot testing proves that it is useful, it

may have a role in firearm suicide reduction in clinical settings (70).

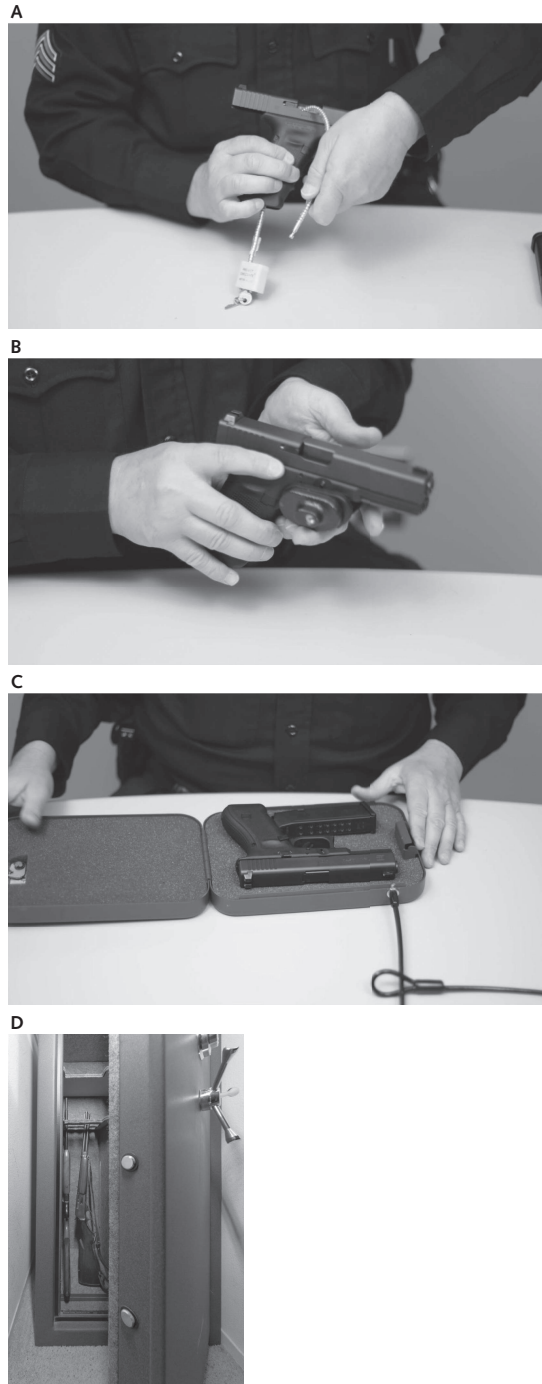
For patients who want to dispose of firearms, permissible options vary from state to state. Sale to a local licensed retailer or delivery to local law enforcement should always be possible. In some states, direct sale or transfer to another private party may also be possible, but these transactions generally do not involve background checks on the persons acquiring the firearms and thus are not recommended.

What further action should clinicians take in situations of acute risk?

In situations of acute risk, clinicians should recommend reducing access as completely and quickly as possible. Options may include eliminating the access of the person at risk using safer storage while keeping the firearm in the home; temporary storage outside the home, such as with a firearm retailer or law enforcement agency; safekeeping by a trusted ad hoc custodian, such as a family member or friend; or sale. Again, available and permissible options vary by location; some states require a private party transfer to take place through a retailer so background checks can be done.

Clinician intervention beyond counseling is indicated when the patient or anyone in the patient's home is at imminent risk for causing harm, whether to themselves or another person. In such situations, the clinician's role is to help temporarily eliminate access to firearms, voluntarily or involuntarily, for that person and to facilitate treatment for medical or psychiatric conditions responsible for the increased risk. Immediate consultation with a medical or mental health specialist may be necessary for adequate outpatient management or, when

Figure 5. Four common devices for safe firearm storage.



A. Cable lock. Cable locks are among the least expensive options for safer storage, and some local police departments distribute them for free. A cable placed through the magazine well and out the ejection port renders the weapon incapable of being fired. **B.** Trigger lock. Trigger locks are also inexpensive. The cylinder of the lock is placed behind the trigger so that it cannot be pulled; the other half of the device is attached and locked into place. **C.** Lock box. Lock boxes come in various sizes for different-sized firearms. They can have combination locks or fingerprint-style locks for quick access, and may be most useful for those who own firearms for personal protection. Some lock boxes come with a cable to allow users to attach the box to a secure fixture. **D.** Firearm safe. Firearm safes may have locks that use combinations, keys, keypads, or biometric technology. They can be expensive to purchase and install; however, they can often accommodate multiple firearms and firearms of different sizes.

Extreme Risk Protection Orders

As of publication, 15 states have emergency protective orders or similar policies: California, Colorado, Connecticut, Delaware, Florida, Illinois, Indiana, Maryland, Massachusetts, New Jersey, New York, Oregon, Rhode Island, Vermont, and Washington. Clinicians are not authorized to petition for these orders except in Maryland, but they may consult with law enforcement or family members and they may provide evidence for the order to the formal petitioner. Experience in Indiana and Connecticut, where similar "risk warrant" policies have been in place for many years, suggests that they are particularly effective in reducing suicide, with a number needed to treat as low as 10 (75, 76).

indicated, voluntary or involuntary hospitalization. In many settings, such resources are not readily available and a 911 call for police assistance may be the best option.

In these situations, clinicians may disclose what would otherwise be considered protected health information. The Code of Federal Regulations, in provisions applying to the Health Insurance Portability and Accountability Act, specifies that disclosure is permitted when the clinician considers it "necessary to prevent or lessen a serious and imminent threat to the health or safety of a person or the public and . . . is to a person or persons reasonably able to prevent or lessen the threat, including the target of the threat" (71). Depending on the circumstances, such persons may include law enforcement or mental health professionals, family members, or caregivers. Non-frivolous threats involving firearms can reasonably be considered serious. The Code of Federal Regulations describes an imminent hazard as one that may cause harm before it can be alleviated by a formal regulatory action (36).

There is no clear guidance about informing patients of such disclosures. Ethical standards set by the American College of Physicians and the American Medical Association agree that decisions not to inform patients or to delay providing information should be

rare but can be made in emergency situations (72, 73). We believe that clinicians should proceed on a right-to-know basis, determining when and whether a patient is informed on the basis of "the balance of benefits and harms" expected to result from providing the information (72).

An increasing number of states have statutes allowing judges to issue emergency protective orders to separate persons from their firearms in situations of acute risk for harm directed at themselves or others (74). These are often called "extreme risk protection orders" or "gun violence restraining orders". They temporarily prohibit the persons subject to them from possessing or purchasing firearms and ammunition. In general, only family members and law enforcement officers can file a petition for an order to be issued, but clinicians can raise the possibility and provide important information for the petition (see the **Box**: Extreme Risk Protection Orders).

Does a physician ever have a legal duty to warn others?

A duty to warn is not specified in federal statutes (71); however, many states developed duty-to-warn laws after *Tarasoff v. Regents of the University of California* (1976), in which a young patient of a University of California psychologist expressed intent to kill a former partner a few months before committing the murder. States' mandates of duty

to warn vary by type of clinician, with many pertaining only to mental health professionals, and they often include provisions to allow communication of confidential information to victims, their families, or law enforcement (77). In states where duty-to-warn laws apply only to psychotherapists, non-mental health specialists may be considered to be acting as psychotherapists in some situations. Clinicians need to be aware of statutes in effect where they practice.

How should clinicians follow up with patients when increased risk has been identified?

After discussing firearms with patients, clinicians should plan to follow up in a manner specific to the circumstances. For example, if the clinician identified increased risk for firearm injury or death on initial screening but the patient reported no firearm access, the clinician may plan to inquire at regular intervals whether there has been a change. Again, the prevalence of firearm ownership among persons with many risk factors is similar to that in the general population. Individuals who are prohibited from having firearms may nonetheless have them. Clinicians should not assume patients do not have firearms simply because having them would be illegal.

A clinician may learn at the first firearm risk screening that an at-risk patient is not safely storing firearms but is amenable to change. In such cases, the clinician can follow up at the next visit about whether the patient was able to implement the advice for safer storage, and why or why not. As with other health behaviors, several discussions may be needed to build readiness, support a decision to act,

and monitor for sustained improvement.

If firearm risk screening leaves a clinician acutely worried about the safety of the patient or someone in the patient's home, he or she might arrange with the patient to make contact in the next 24 to 48 hours.

Firearm risk and access to firearms may change from one visit to the next. We recommend that clinicians regularly assess risk, ask about access when relevant, and follow up when needed.

If firearms are recovered from the patient, how is it determined whether and when it is safe for them to be returned?

A background check to verify that the person is not prohibited from possessing firearms will likely be required, but many at-risk persons pass background checks. Beyond statutory

prohibitions, there are no firm standards for the return of firearms to persons who are a danger to themselves or others. No formal training or guidelines exist for assessment of competency specifically to possess or use firearms, and the limited ability of clinicians to accurately predict risk on an individual level, even with the help of risk assessment

tools, has been documented (78). Nonetheless, clinicians may be called on to help determine whether return is appropriate. Best clinical judgment in such cases should consider the status of characteristics associated with risk and whether further interventions to reduce risk are available. Consultation with or referral to a mental health professional may be advisable.

Prevention... No state statutes prohibit clinicians from talking about firearms with patients, and federal prohibitions are narrow. When discussing firearms, clinicians should take a conversational and collaborative approach, acknowledging an understanding of the firearm owner's reasons for ownership. Patients are generally receptive to clinician counseling on firearms. When no one is at imminent risk, the clinician can recommend safer storage techniques, including safe storage devices. In acute risk situations, clinicians should recommend that the at-risk person not have access to firearms for the duration of the crisis. Arranging for temporary storage outside the home may be possible, and clinicians should understand the options allowed in their states.

CLINICAL BOTTOM LINE

Practice Improvement

What organizations support clinician risk assessment and counseling on firearms?

Following is an alphabetical list of health professional associations that have endorsed increased member involvement in firearm violence prevention, including risk assessment and counseling on safe firearm practices (79).

- American Academy of Family Physicians
- American Academy of Pediatrics
- American College of Emergency Physicians
- American College of Physicians
- American College of Surgeons
- American College of Obstetricians and Gynecologists
- American Medical Association
- American Psychiatric Association
- American Public Health Association

In October 2018, the American College of Physicians published updated and strengthened policies for reducing firearm-related injury and death (80). Also in 2018, the American Medical Association, the American College of Surgeons, and the American Association for the Surgery of Trauma published renewed statements on firearm injury and its prevention (81–83).

In the Clinic Tool Kit

Preventing Firearm- Related Death and Injury

Patient Information

<https://health.ucdavis.edu/what-you-can-do/educational-handouts.html>

Patient handouts on the risks of firearms in the home and the importance of safer storage from the UC Davis Violence Prevention Research Program's What You Can Do initiative, in English and Spanish.

www.cdc.gov/violenceprevention

Information on violence prevention from the Division of Violence Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention.

www.facs.org/~media/files/quality%20programs/trauma/ipc/gunsafety_brochure.ashx

"Gun Safety and Your Health" patient handout from the American College of Surgeons.

www.massmed.org/firearmguidanceforpatients

"Gun Safety and Your Health" patient handout from the Massachusetts Medical Society.

Information for Health Professionals

<https://affirmresearch.org>

Help to find solutions to gun violence by joining the American Foundation for Firearm Injury Reduction in Medicine (AFFIRM).

www.youtube.com/watch?v=JbwgQOKR9Ew&feature=youtu.be

Video on identifying patients at increased risk for firearm injury and preventing injury and death from the UC Davis Violence Prevention Research Program's What You Can Do initiative. Continuing medical education credit is available.

www.facs.org/quality-programs/trauma/advocacy/ipc/firearm-injury

Firearm injury prevention activities from the American College of Surgeons.

<http://nnhvip.org>

Violence prevention information from the National Network of Hospital-based Violence Intervention Programs.

www.hsph.harvard.edu/means-matter

The Means Matter Campaign from the Harvard Injury Control Research Center, Harvard T.H. Chan School of Public Health.

www.massmed.org/Patient-Care/Health-Topics/Firearm-Violence-Resources/#.XKS8cZhKi72

How to talk to your patients about gun safety from the Massachusetts Medical Society.

<https://speakforsafety.org>

Speak for Safety campaign to raise awareness of the Gun Violence Restraining Order in California from the California Firearm Strategy Group.

In the Clinic

WHAT YOU SHOULD KNOW ABOUT PREVENTING FIREARM-RELATED DEATH AND INJURY

What Should I Know About Death and Injury From Firearms?

People own firearms (guns) for many reasons, including protection, hunting, and other sporting use. Injury or death from guns is a large public health problem. Gun violence ranks among the 10 leading causes of death for Americans and is increasing. Although murders, including mass shootings, are commonly reported in the news, most firearm-related deaths are suicides.

Who Is Most at Risk?

People who live in a home where there is a firearm are at greater risk for unintended death, suicide, or murder. An immediate risk is present if you or someone you know has a gun and expresses an interest in harming themselves or others. Other persons with risk factors for experiencing or causing a gun injury or death include those who:

- Misuse alcohol or other substances
- Have a history of violent behavior
- Have dementia or another form of poor mental function
- Have serious and poorly controlled mental illness
- Have an abusive partner

People who belong to certain demographic groups are also at high risk:

- Young black and Hispanic men are at higher risk for homicide by gun.
- Middle-aged or older non-Hispanic white men are at higher risk for suicide by gun.
- Children who visit or reside in a home with a gun are at higher risk for injury or death by gun.

What Should I Do to Protect My Family From Injury if I Own a Gun?

Guns should be stored unloaded and locked up. Ammunition (bullets) should be stored separately. Storage options include locking devices, lock boxes, and firearm safes. Keep keys out of reach of those who should not have access. Your health care provider or local law enforcement may be able to guide you about where to obtain these devices.



What Can I Do About Guns in the Homes of Family or Friends?

If you are concerned about guns in the home of a family member or friend, your health care provider can help you approach this issue. If you or someone you know is at immediate risk for harm, your provider may be able to help find a way to reduce this risk and to keep you and others safe, including arranging for someone else to temporarily hold the gun.

Is It Legal for My Health Care Provider to Ask Me About Guns?

Your health care provider may ask about guns and their safe storage just as he or she might ask about other issues related to your safety and health (such as the safe storage of chemicals when there are small children in the home). Such conversations are legal, and no state laws prohibit you and your health care provider from talking about gun safety and reducing risks. However, just like any other health issue, you are not required to engage in a discussion if you don't want to.

Questions for My Doctor

- Should I be concerned about firearm safety?
- What should I do to protect my family from injury if I own a gun?
- Why is proper gun storage so important?
- How can I safely store my firearms?
- How can I get help if I am feeling suicidal or violent?
- How can I help a friend or family member who has access to guns and is suicidal or violent?

For More Information



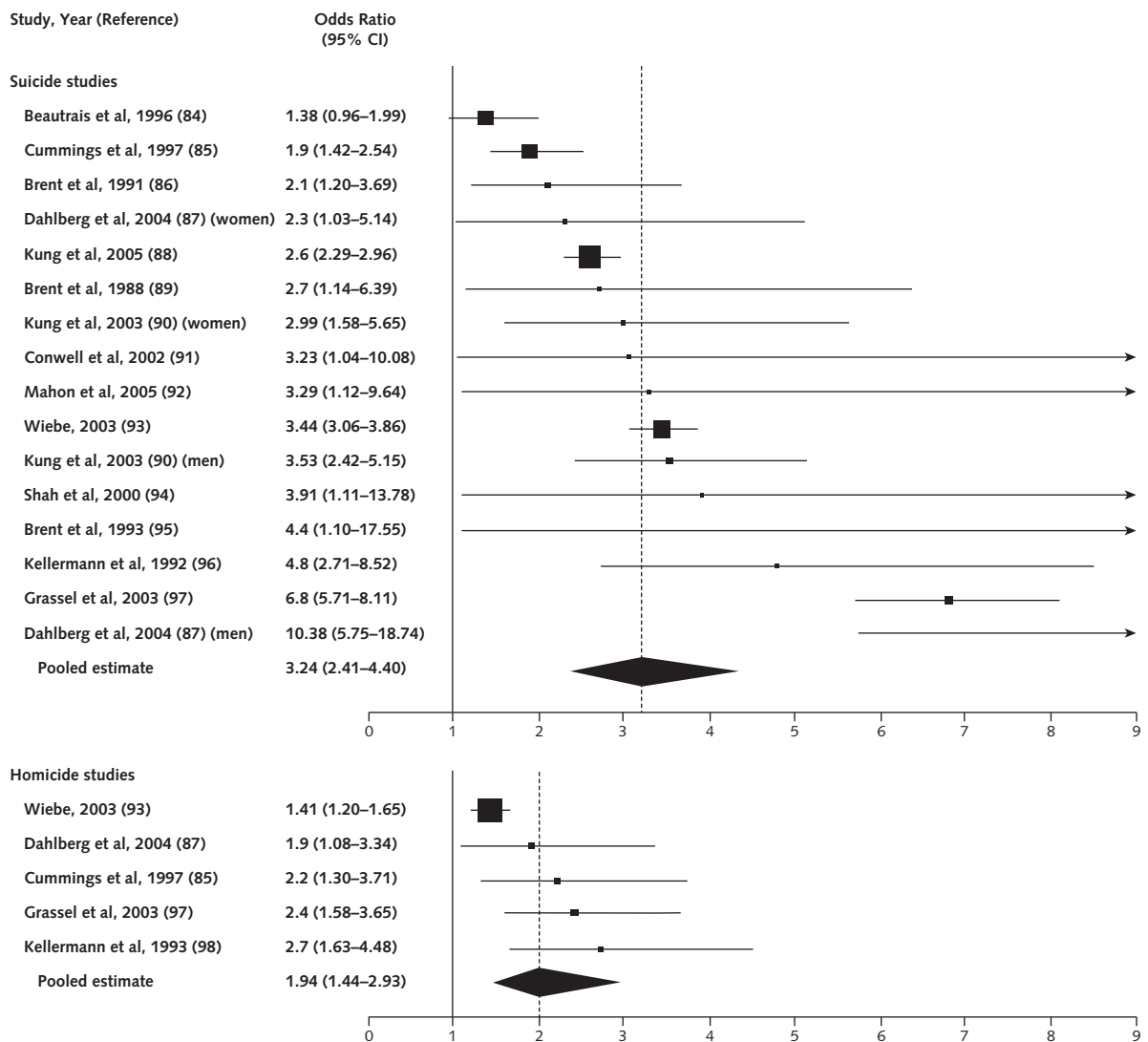
American Psychological Association

www.apa.org/topics/violence/gun-violence-prevention

MedlinePlus

<https://medlineplus.gov/gunsafety.html>

Appendix Figure. Odds of suicide and homicide in the context of firearm access.



From reference 17.

Appendix Table 1. Characteristics of Studies of Suicide and Homicide Victimization

Study, Year (Reference)	Population	Location	Firearm-Specific Outcomes	Type of Case Patients	Type of Control Participants	Gun Access, %	
						Case Patients	Control Participants
Suicide outcomes							
Brent et al, 1988 (89)	Adolescents	Pennsylvania	55.6% of suicides	Serially reported*	Inpatient adolescents who attempted suicide†	74.1	33.9
Brent et al, 1991 (86)	Adolescents	Pennsylvania	69% of suicides	Serially reported*	Inpatient adolescents who attempted suicide†	72.3	37.0
Kellermann et al, 1992 (96)	Adults	Tennessee, Washington, Ohio	51%-73% of suicides	Serially reported within home*	Community control participants‡	65.0	41.0
Brent et al, 1993 (95)	Adolescents	Pennsylvania	70.2% of suicides	Serially reported*	Community control participants†	75.4	50.8
Beautrais et al, 1996 (84)	Adults	New Zealand	13% of suicides	Serially reported*	Community control participants	23.9	18.5
Cummings et al, 1997 (85)	Adults	United States	52% of suicides	HMO member cross-referenced with death certificates	HMO member	24.6§	15.1§
Shah et al, 2000 (94)	Adolescents	Colorado	Firearm-only cases	Death certificate*	Students at same school‡	72.0	50.0
Conwell et al, 2002 (91)	Adults >50 y	New York	47.7% of suicides	Serially reported*	Community control participants‡	62.7	41.3
Grassel et al, 2003 (97)	Adults	California	47.4% of suicides	Deaths from violence or firearm	Deaths from noninjury causes	8.4§	<1.0§
Kung et al, 2003 (90)	Adults	United States	Any means	Deaths determined from death certificate to be suicide*	Deaths determined from death certificate to be natural‡	Men: 69.5 Women: 56.0	Men: 46.8 Women: 32.0
Wiebe, 2003 (93)	Adults	United States	63.5% of suicides	National Mortality Followback Survey data and death certificates*	National Health Interview Survey	65.8	36.7
Dahlberg et al, 2004 (87)	Adults	United States	68% of suicides	Cohort defined using National Mortality Followback Survey data and death certificates¶	Cohort defined using National Mortality Followback Survey data and death certificates¶	72.4	32.0
Kung et al, 2005 (88)	Adults	California	Any means	Deaths determined from death certificate to be suicide*	Deaths determined from death certificate to be natural‡	64.2	26.4
Mahon et al, 2005 (92)	Adults	Ireland	52% of suicides	Autopsy reports and death certificates	Deaths from all other causes**	41.0††	17.0††
Homicide victimization outcomes							
Kellermann et al, 1993 (98)	Adults	Tennessee, Washington, Ohio	49.8% of homicides	Serially reported within home*	Community control participants**	45.4	35.8
Cummings et al, 1997 (85)	Adults	United States	56.4% of homicide cases	HMO member cross-referenced with death certificates	HMO member	21.4§	11.9§
Grassel et al, 2003 (97)	Adults	California	66.2% of homicide cases	Deaths from violence or firearm	Deaths from noninjury causes	2.0§	<1.0§
Wiebe, 2003 (93)	Adults	United States	76% of homicide cases	National Mortality Followback Survey data and death certificates*	National Health Interview Survey	30.7	34.0
Dahlberg et al, 2004 (87)	Adults	United States	68% of homicide cases	Cohort defined using National Mortality Followback Survey data and death certificates¶	Cohort defined using National Mortality Followback Survey data and death certificates¶	41.9	32.0

* Proxy interviews.

† Parent or guardian interviews.

‡ Control participant proxy interviews.

§ Proportion of participants with firearm access determined by gun purchase data.

|| Unreported percentage.

¶ Decedent proxy interviews.

** Of determined causes.

†† Proportion of participants with firearm access determined by military duty service time.

Appendix Table 2. Literature Review of the Effectiveness of Clinician Intervention Regarding Firearm Safety

Author, Year (Reference)	Study Name	Design	Outcome	Main Results
Kruesi et al, 1999 (100)	Suicide and violence prevention: parent education in the emergency department	Prospective follow-up of parents of children seen in the ED for mental health assessment or treatment who either did or did not (control group) receive means-restriction counseling from ED staff	Likelihood of caretaker action subsequent to the visit to limit access to lethal means, including firearms, alcohol, and prescription and over-the-counter medications	No parents in the control group took action to remove firearms in the home; those who received counseling were significantly more likely to take action (aOR, 3.6 [95% CI, 1.1-12.1]; $P = 0.04$)
Brent et al, 2000 (101)	Compliance with recommendations to remove firearms in families participating in a clinical trial for adolescent depression	Parents of children participating in a randomized clinical trial in psychotherapy were systematically asked about firearms in the home; those who answered affirmatively were counseled	The rate of compliance with the clinician's recommendations to remove firearms from the homes of depressed adolescents participating in a clinical trial	At the end of the trial, 26.9% had complied, increasing to 36% at the end of 2 years. In homes without firearms at the start of the trial, 17.1% had acquired them at the time of follow-up.
Grossman et al, 2000 (102)	Firearm safety counseling in primary care pediatrics: a randomized, controlled trial	A randomized controlled trial that instructed health care providers to either counsel regarding firearm safety, including providing written materials regarding the risks of acquisition and importance of safety with coupons for 1 trigger lock and 1 lockbox at a discount, or not (control group)	Changes in self-reported events, including acquisition of safe storage devices, removal of firearms from the home, and acquisition of firearms	No significant difference was seen between the control and intervention groups
Stevens et al, 2002 (103)	A pediatric, practice-based, randomized trial of drinking and smoking prevention and bicycle helmet, gun, and seatbelt safety promotion	Randomized control trial in which 12 pediatric practices were assigned to a control in which no one received firearm counseling ($n = 6$) or an intervention group, involving multimodal firearm safety counseling with site support, telephone calls, and written mailed materials	Outcomes included guns in the child's home in locked storage, along with other health risk behaviors, such as use of alcohol or tobacco products	No significant difference was seen between control and intervention groups
Albright et al, 2003 (104)	Improving firearm storage habits: Impact of brief office counseling by family physicians	Firearm-owning patients received no counseling, verbal counseling alone, or verbal and written counseling from their physician; postintervention surveys were used to determine the effectiveness of counseling	Firearm storage habits at baseline and 60-90 d after the intervention as self-described through a postintervention survey	Sixty-four percent of the verbal counseling group, 58% of the verbal and written counseling group, and 33% of the no-intervention group had made a safe change in gun storage ($P = 0.02$)
Carbone et al, 2005 (105)	Effectiveness of gun-safety counseling and a gun lock giveaway in a Hispanic community	Firearm-owning families in a pediatric clinic were assigned to an intervention group, including written and verbal counseling along with a free gun lock, or a control group that received typical anticipatory guidance; participants were surveyed in 1 mo	Changes in frequency of unloaded and locked firearm storage, or changes to the use of locked storage	Families in the intervention group were more likely to have improved gun safety practices in the period of follow-up than the control group (relative risk, 2.29 [CI, 1.52-3.44]); 25% of the intervention families and 4.8% of control families increased the frequency of locked storage of firearms at 1-mo follow-up
Sidman et al, 2005 (106)	Evaluation of a community-based handgun safe-storage campaign	Quasi-experimental design to compare the effectiveness of a safe-storage campaign. The intervention county received television, radio, and billboard firearm safety counseling, and residents received discount coupons for lock boxes. Control counties were compared via cross-sectional, random-digit-dial telephone surveys.	Outcomes included whether all firearms in the home were stored with trigger locks, lock boxes, or gun safes (formal locking device); whether firearms were stored loaded; and whether any were stored loaded without a formal locking device	There was a statistically significant increase in storage of handguns in gun safes or lock boxes in the intervention group (aOR, 1.66 [CI, 1.01-2.72])
Barkin et al, 2008 (54)	Is office-based counseling about media use, timeouts, and firearm storage effective? Results from a cluster randomized controlled trial	Cluster randomized controlled trial in which the intervention group received verbal counseling on firearm storage, and the control group was given an educational handout on literacy promotion	Change in time in self-reported firearm cable locks	Storing firearms with cable locks increased in the intervention group (9.7%) and decreased in the control group (-11.7%; $P < 0.001$); with adjustment, the intervention had an odds ratio of 2.0 ($P < 0.001$) for safer storage

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Appendix Table 2—Continued

Author, Year (Reference)	Study Name	Design	Outcome	Main Results
Grossman et al, 2012 (107)	Improving firearm storage in Alaska native villages: a randomized trial of household gun cabinets	Wait list, randomized trial design with an "early" group that received an intervention at baseline and a "late" group that received the intervention at 12 mo. The intervention includes installing up to 2 gun cabinets in each enrolled home along with safety counseling. In-person surveys were conducted at 12 and 18 mo.	The proportion of households reporting unlocked guns or ammunition, and direct observation of unlocked guns	At 12 mo, 35% of homes in the early intervention group reported unlocked guns compared with 89% in the late group ($P < 0.001$). At 18 mo, the prevalence of these storage practices was maintained. Unlocked guns observed decreased significantly between the early and late groups ($P < 0.03$).

aOR = adjusted odds ratio; ED = emergency department.

* Articles were selected by the authors from the literature on the basis of continuing surveillance and automated literature searches. No systematic search was done specifically for this purpose.

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