Public Health and the Law

Nonpowder Firearm Injuries: Whose Job Is It to Protect Children?

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Nonpowder firearms are guns and rifles that employ compressed gas to propel steel BBs, lead pellets, or darts. The source of the compressed air can be pneumatic pump compression, spring-with-piston air compression, or pressurized carbon dioxide cartridges. An estimated 2–2.5 million nonpowder firearms are sold in the United States each year, most for ages 8 to 18; according to industry officials, about one-half of these guns are marketed to children under 15 years old.[1,2] Although these weapons are commonly perceived as playthings, they can in fact produce maximum velocities exceeding 700 feet/second, well above the velocity required to penetrate the human eye (130 feet/second) and skin and bone (350 feet/second). The common BB gun produces muzzle velocities of about 280 feet/second, more than adequate for penetrating the eye.[3]

Nonpowder firearms are not as powerful or as lethal as guns and rifles using exploding powder to propel ammunition, but they are nonetheless dangerous. Nonpowder firearms are used widely by children and are responsible for a substantial number of childhood injuries.[4] Despite this, nonpowder firearms are less well regulated than many other childhood hazards. More should and could be done to afford children protection from this known hazard. This article will review various alternative approaches to such protection, show how they are not being used effectively, and suggest some possible improvements in controlling this hazard.

The Danger

The danger posed by nonpowder firearms has been recognized for some time.

> Prominent among reported nonfatal injuries to children are eye injuries, including traumatic cataracts, retinal detachment, sympathetic ophthalmitis, hyphema, and intraorbital pellets; such injuries may result in permanent eye damage or enucleation. Reported injuries also include vascular chest injuries, pulmonary injuries, intra-abdominal hemorrhage, intracranial injuries, bone penetration, muscle penetration, a pellet emoblizing in the internal cartoid artery, Horner's syndrome, and lead poisoning. Fatalities have been described that were caused by head injury and penetration of the heart and aorta.[4-6]

Data relating specific injuries to specific types of nonpowder firearms are quite limited. It is known that the greater the muzzle velocity the more serious the injury, but the Consumer Product Safety Commission has estimated that 20 to 30 per cent of nonpowder firearm injuries are caused by the slower velocity, single-pump BB gun.[6]

The total number of nonpowder firearm injuries occurring in the United States is large: 1984 estimates range from 19,537 to 34,495, with close to three-fourths of the victims less than 15 years old.[7,8] This is presumably an underestimate of the true incidence of injury due to limitations in national data-gathering practices and in medical reporting of weapon type. The nature of the injuries caused by nonpowder firearms makes the number of injuries particularly worrisome. According to the American Academy of Ophthalmology, "BB and air-powered pellet guns are a major cause of serious eye injury and blindness, particularly for adolescent boys."[9] Suggestive of the overall seriousness of the problem is the percentage of various types of childhood injuries which result in hospitalization. For nonpowder firearms this figure "ranged from nearly 6 per cent for victims 2 to 5 years of age to almost 17 per cent for victims under 2 years of age," as compared to an average 4 per cent rate for all consumer products reported on by the Consumer Product Safety Commission's National Electronic Injury Surveillance System.[7] Nonpowder firearm fatalities are rare, but do occur.[6]

The Problem

It should perhaps be obvious that a device which releases highly concentrated mechanical energy is dangerous and does not belong in the hands of children. What makes the nonpowder firearm problem especially insidious is that these weapons are frequently *not* perceived as dangerous. Instead they are treated more like toys, as somewhat innocuous trappings of childhood, almost a rite of passage for boys. Thus they are made accessible to children, usually without adequate adult supervision. The Consumer Product Safety Commission found that 60 per cent of those injured by nonpowder firearms were under 16 years of age and that in 80 per cent of these cases no adult was present at the time of the injury. Of those injury cases in which the gun user was under 16 years old, 82 per cent of the guns were owned by children under 16; in almost all instances the gun had been a gift or had been purchased with the assistance and permission of an adult.[10] As one critic of this "deadly toy" has noted:

> Airguns are a unique product. Some are marketed as if they were toys—but they're exempt from toy safety legislation. On the other hand, most firearms legislation ignores them. So although the leading maufacturers state on their packaging that air guns are not toys, kids in many states are free to walk into a store and buy one.[11]

The resulting situation is a classic public health problem: a dangerous agent (sudden energy release), a vulnerable host (children), and a vehicle (airpowered projectiles) which are widespread, uncontrolled, and accepted.

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What could be done

There are two main things that could be done to reduce the number of injuries to children from these dangerous "toys". First, access to nonpowder firearms could be limited, so that at least younger children do not use them or do not use them without adult supervision. Second, nonpowder firearms could be redesigned to make their use less hazardous. Possible improvements would include a feature to allow the user to easily tell whether there is ammunition in the magazine, a limitation on muzzle velocity, safety devices that would discourage use by very young children, and impact-absorbing ammunition. The critical question that must be answered if this danger to children is to be controlled is: where is the impetus for change to come from?

Whose responsibility is it?

There are seven district entities that could be turned to in a search for child protection from nonpowder firearm injuries: the children themselves, their parents, manufacturers, retailers, the federal government, state governments, and the courts. For the most effective protection all must be involved. To date, none has played an adequate role.

Children—The potential user/victim should have the strongest incentive for avoiding injury. But nonpowder firearm injuries occur primarily among children, whose self-protective motives and skills are often weak. Safety education designed to increase user self-protection would therefore be expected to have limited impact, with any positive effect limited to older users. One example of the educational approach, outlined at a recent joint meeting of the National Rifle Association, National Society for the Prevention of Blindness, and the Non-Powder Gun Products Association, is the distribution of gun safety instructional materials through recreation departments, civic clubs, and youth organizations. Included would be "lesson plans for a basic shooting safety course" and "messages to youngsters, parents and community groups, video materials, and educational coloring/drawing booklets."[12] However, there are no studies showing that sporadic, short-duration approaches have been effective in changing behavior, particularly pre-teen and adolescent behavior.[13]

Parents—Most nonpowder firearms are marketed with warning labels and literature emphasizing the potential for injury and recommendations for adult supervision of use. But as Julian Waller notes in his text on injury control: "Education of parents is recommended by some groups as the best approach to firearm safety in the United States. To date, however, there is little or no evidence that this approach has been of any value."[14] BB guns, in particular among nonpowder firearms, are widely viewed as relatively harmless playthings, so it is little wonder that parental supervision and instruction in use may be given inadequate attention. Only the threat of legal liability (discussed below) would seem to have any potential for changing this situation. However, even then, and even if the benign perception parents have of BB guns changes, the peer orientation and mobility which characterize adolescence will make supervision of adolescent nonpowder firearm use impossible.

Manufacturers—The manufacturers of nonpowder firearms obviously play an important role in determining the safety of their product, since they control not only how the guns perform but also the circumstances under which they are marketed. Individual manufacturers can have an impact both through their own production and sales practices and as members of their trade association, the Non-Powder Gun Products Assocation (NPGPA).

The American Society for Testing and Materials (ASTM) has issued standards for non-powder guns[15] and for non-powder gun projectiles and propellants.[16] These voluntary safety standards provide that nonpowder firearms should be designed and manufacturered such that they:

- shall not discharge during cocking;
- shall not discharge unintentionally when used according to the manufacturer's directions;
- have a trigger mechanism that requires a force of at least 2 pound-feet to fire;
- have a safety mechanism capable of preventing firing when a static load of 30 pound-feet is applied to the trigger;
- can be dropped from a height of three feet without firing;
- are not marketed with a label recommending use by persons under 8 years of age;
- are packaged with instructional and warning literature and a cautionary statement which says:

> "NOT A TOY. ADULT SUPERVISION REQUIRED. MISUSE OR CARELESS USE MAY CAUSE SERIOUS INJURY, PARTICULARLY TO THE EYES. MAY BE DANGEROUS UP TO — YARDS." (Distance specified to be 1.25 times a guns maxium firing distance.)

However, the protection afforded by these standards is limited, because of their voluntary nature, and because of the weakness or complete absence of some important safety requirements. In 1981, the Consumer Product Safety Commission (CPSC) suggested to the NPGPA that the voluntary standards should be upgraded to call for:

> limited magazine capacity; positive indication to the user that the product contains ammunition in the magazine; additional cautionary labeling; a performance requirement for an effective trigger guard; higher age limitation requirements; and "instructions to parents" for all products, and not just for the lower-powered units.[17]

There are of course many other upgradings of the ASTM standards that could be adopted, but these suggestions from the Reagan-era CPSC outline a minimal strengthening of the voluntary standards. In response, the industry and ASTM considered and rejected the first three recommendations, accepted the trigger guard recommendation (already met by all conventional non-powder guns), raised the age *labeling* limitation to one of not recommending use by persons less than 14 years of age *for higher-powered guns only,* and accepted the parental-instructions recommendation for general purpose guns.[18] These changes still sanction use of higher-powered guns by youngsters 14 or older, use of less powerful but still hazardous nonpowder firearms (with muzzle velocities up to 350 feet/second) by children over age 7, and limit safety warnings to those which appear on the soon-discarded original packaging, rather than permanent warnings on the guns themselves. All in all, the manufacturers' response to the CPSC's minimal recommendations can only be characterized as inadequate.

Retailers—The seller of a nonpowder firearm can play a critical role in alerting the purchaser to the hazards involved. Although it might involve a competitive disadvantage, safety-conscious retailers can refuse to sell directly to children (even when allowable by law) and can refuse to sell to an adult if it is apparent that the gun is to be used by a young child. According to a spokesperson for the Non-Powder Gun Products Association, "Members of NPGPA do not market their products as toys. It is against the industry policy. Manufacturers deal only with sporting goods buyers when selling their products to distributors."[19] However, BB guns are available from at least some toy stores and department stores.

Federal Standards—The federal government does not regulate nonpowder firearms. The agency with the appropriate authority to regulate in this area is the Consumer Product Safety Commission.[20] The potential for injury from nonpowder firearms would seem to be equal to or greater than that posed by other toys over which the Commission has exercised its jurisdiction.[21–25] For example, the Commission has banned the sale of lawn darts to children,[26] set a top limit (measured in decibels of impulse-type sound produced) for caps used in toy guns,[27] established mechanical and performance standards for bicycles,[28] and promulgated rules setting temperature standards for the insides of toy ovens.[29] Yet the Commission has not issued any regulations for nonpowder firearms, not even as to product labeling for such firearms. Commission staff have on several occasions studied the nonpowder firearm problem and documented the hazards involved. And the Commission has been petitioned to issue regulations on nonpowder firearms. But rather than acting, the Commission has chosen to rely on "adult supervision" and voluntary industry standards. In a letter reaffirming the Commission's refusal to act on nonpowder firearms, a Commission spokesperson noted that:

> The mission of the Consumer Product Safety Commission is to protect the user of products from unreasonable risks of injuries associated with the product. In most instances you cite, it is not the user of the nonpowder firearm who is injured, but rather someone in the vicinity.[30]

Such logic suggests that the Commission is not likely to soon reverse its unwillingness to act regarding nonpowder firearms. Since no other federal agency has relevant jurisdiction, the only way in which federal action regarding nonpowder firearms could occur would be if the CPSC were specifically directed by statute to regulate these devices. In an era in which the National Rifle Association and its allies have wielded considerable power in Congress, effective federal legislation does not seem likely.

State Regulation—About a dozen states have laws restricting the sale and/or use of nonpowder firearms or requiring a permit for possession. According to a CPSC study:

> Six states restrict the sale or use to persons over a designated age, usually 18. In Connecticut anyone carrying an air-gun must have a permit and in Rhode Island air-guns are considered firearms subject to the same laws and regulations as firearms. One state, Wisconsin, prohibits the reckless use of any weapon, including airguns.[10]

Massachusetts prohibits the sale of air rifles and BB guns to persons under age 18 and prohibits such minors from possessing such weapons "in any place to which the public has a right of access" or from discharging them anywhere unless accompanied by an adult or properly licensed to do so.[31] Notes one observer, although "ophthalmologists have periodically lobbied for regulations that would diminish accidents, the sad fact is that today there are fewer states with regulations than thirty years ago."[11]

Some localities have their own sale and use restrictions regarding nonpowder firearms. For example, a Chicago ordinance places such onerous permit and license requirements on both buyer and seller that sales of air rifles and air guns are virtually nonexistent in the city.[32] The effectiveness of state and local restrictions on nonpowder firearm sale and use depends on enforcement. Given the general attitude regarding these guns and rifles, it seems doubtful that such restrictions are widely adhered to, but no studies seem to have been conducted on this point.

A bill to restrict the sale and possession of nonpowder firearms was introduced in the Washington state legislature in 1985. A bill to completely prohibit the sale, use, and possession of air rifles, BB guns, and pellet guns was introduced into the New Hampshire legislature in 1986. Neither bill made it out of committee and no other such legislation would seem to have been introduced elsewhere during these years.[33–35] This situation indicates little current interest at the state level in increasing the regulation of these weapons.

The Courts—One approach to injury control, especially where regulatory action has been inadequate, is to turn to the courts.[36–38] By varying the defendant, negligence lawsuits can be used to affect this hazard in three different ways.

Lawsuits against parents or other adults who allow children to play with nonpowder firearms may discourage other parents from allowing their children to have such weapons. In theory, at least, this is parental education with teeth. *Teter v. Clemens*[39] resulted from a five-year old boy shooting another five-year old boy in the eye with a pellet pistol. A lawsuit was brought in behalf of the injured boy against the grandparents of the other boy for not having kept the pistol inaccessible to their grandson and his playmates. The legal question was whether a cause of action should be recognized by the court "against a person who places in the hands of a minor a dangerous instrument, or an article under such circumstances that he has reason to know that the minor is likely to use the article in such a manner as to create an unreasonable risk of harm to others, and who causes a foreseeable injury to another." The court concluded that such a cause of action could be brought.

Lawsuits against retailers may discourage other retailers from selling nonpowder firearms when they know or have reason to know that young children will use the weapons. Lawsuits against retailers might similarly encourage retailers to provide purchasers with information on the dangers associated with the weapons and with the importance of adult supervision. In *Semeniuk v. Chentis*[40] a lawsuit was brought against the retailer who sold an airgun to a parent, knowing that the gun would be used by a boy less than 7 years old. The Illinois Appellate Court held that the retailer had a duty to persons subsequently injured by use of the gun in this foreseeable manner. This decision was commented on favorably in the Restatment (Second) of Torts.[41] Courts in several other states have reached similar conclusions.[42–47]

However, lawsuits against parents and retailers are less likely to have a meaningful impact than are lawsuits directed against the manufacturers of nonpowder firearms. As Stephen Teret has noted:

> Product liability litigation is now being used as an effective tool for public health advocacy. Its use is based on the premise that substantial settlements and verdicts against the manufacturer of an unnecessarily dangerous product will ultimately cause that manufacturer to invest in prevention rather than pay the penalty for neglect.[36]

A recent lawsuit against the Daisy Manufacturing Company suggests a considerable potential for influencing future nonpowder firearm designs. The lawsuit grew out of a situation in which an 11-year old boy playing with a BB gun shot a 3-year old, causing brain damage such that the victim functions like an 8-month old (cannot walk or talk and is incontinent), but has an expected normal lifespan.[48] The older boy testified that he had looked in the gun's chamber and had shaken the gun in order to determine if it was loaded. Finding no evidence of BBs, he pulled the trigger three times without anything coming out. A fourth pull fired a BB into the brain of the victim, who was walking nearby. A pretrial settlement was arrived at with the parents of the older boy and the owner of the home where the

shooting occurred. A separate action was brought against the manufacturer, claiming that it was negligent to design and market a BB gun which lacked a feature that would allow the user to tell if it was loaded. The plaintiff's attorney argued that internal company memoranda acknowledged that users could not tell if the guns were loaded and that this was dangerous.[48] The plaintiff succeeded at trial with an award of $17.5 million.[49] This very large award was covered by insurance, and the decision is still before the courts and could ultimately be reduced or overturned. But it is fair to assume that BB gun-redesign will become a priority item for the nonpowder firearm industry during the coming year.

Conclusions

Nonpowder firearms are a hazard from which children need protection. Protection through parental supervision and voluntary manufacturing standards should be encouraged, but will not suffice. Unfortunately, while the Consumer Product Safety Commission would seem to be the most logical force for protection in this area, Commission action seems unlikely in the foreseeable future. Enactment and enforcement of state and local laws should be encouraged, but significant progress is unlikely soon: there is little public pressure for action and high-powered opposition by the pro-gun lobby is a foregone conclusion. At this time, product liability suits are probably the best hope for affecting the situation. The Daisy BB gun case in itself should have an important impact on the industry, but even more significant should be the realization that failure to implement the corrective design and marketing changes long urged by critics will leave the manufacturers open to escalating liability problems.

In addition to being hazards in themselves, nonpowder firearms also offer lessons about controlling other injury problems. The similarity to the hazard posed by powder firearms is the most obvious. While powder firearms are far more lethal, the numbers of nonfatal injuries attributable to powder and nonpowder firearms are comparable, with the nonpowder firearm injuries occurring in a younger age group. In both instances, a clear hazard is inadequately dealt with by the legislative and regulatory arms of state and federal governments. Both types of gun hazards vividly demonstrate the inadequacy of voluntary safety standards as a means of controlling injury hazards.[50]

Nonpower firearms demonstrate many of the special aspects involved in providing protection for the young members of society. When injury is prevalent, serious, and avoidable, an organized societal response is called for. The response should entail aggressive and progressive regulation until a specified level of injury reduction is achieved.[51] Such regulation will always provoke objections that other important values and interests are being harmed. The question ultimately is: Whose interest is to take precedence? The question is particularly pointed when the potential victims—such as children—lack the ability and judgment to adequately protect themselves.

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