



Photo: M. Dorgabekova

Unsafe Injections, Fatal Infections

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The village health worker smiles at his customer and asks, “Injection OK?”

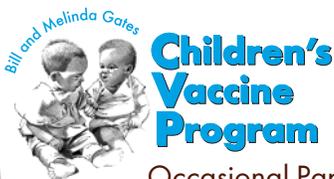
It is a question he has already posed many times this morning and most of his patients are happy to comply. In fact they expect him to offer an injection and might feel cheated if he did not. This scenario is repeated in urban and rural clinics, in high-tech hospitals, and in shanty pharmacies every day across the globe. The World Health Organization estimates that about 12 billion injections are given each year! Unfortunately, most of these injections are unnecessary and, if given in an unsafe manner, can actually pose a threat to health.

Too Many Injections

In many places injections are perceived as the optimal form of care, a symbol of the best that medicine has to offer and the most efficient and rapid way to find relief. A recent study found that 25 percent to 96 percent of outpatient visits in developing world countries resulted in an injection. More than 70 percent of these were antibiotics, vitamins, analgesics, or other drugs inappropriately given for upper respiratory disease, diarrhea, fever, or general fatigue. Not only do such injections do no good, they are a significant waste of scarce resources.

Dangerous Injections

When injections are given in a medical setting we expect that the treatment will make us feel better (or at least that it will help more than it harms). But the medical principle “first, do no harm” is violated every day through unsafe injections. The results of infection can be relatively benign or can be fatal. A patient may develop a bacterial abscess at the injection site—a telltale sign of unsafe practices—and it is not difficult to see that the injection was the cause. In contrast, when an unsafe injection causes potentially deadly infections with hepatitis B, hepatitis C, or HIV, chronic disease or death occurs after several years. In that case, clinicians and patients are not able to make the



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connection between the unsafe injection and the consequences. Without clearly understanding the root of the problem, they cannot begin working on solutions.

But that situation is changing. Recent studies in China and in Pakistan found alarming rates of hepatitis C infection and liver disease. Both studies found that only a subset of infected persons had the traditionally recognized risk factors—blood transfusions or recreational injecting drug use—but they found a strong correlation between infection and previous medical injections. Similarly, the high rate of hepatitis C infections in Egypt has recently been attributed to unsafe injections.

This is also true of hepatitis B, a virus which is transmitted ten times more efficiently than hepatitis C and a hundred times more efficiently than HIV. Population-based studies from China, India, and former Soviet states have shown unsafe injections to be a major source of hepatitis B infection.

The global burden of disease caused by unsafe injections is difficult to calculate with certainty. However, using mathematical models, scientists estimate that unsafe injections may cause 8 to 16 million hepatitis B infections and 2.3 to 4.7 million hepatitis C infections each year. Most of these occur in developing countries. At these rates, one in 100 people born in developing countries could die prematurely of chronic viral hepatitis attributable to unsafe injections.

Contaminated needles and syringes may also be responsible for 80,000 to 160,000 HIV/AIDS infections annually. Studies have shown that more than 5,000 children in Romania and Ukraine were infected with HIV in outbreaks attributed to massive overuse of injections and the reuse of unclean injection equipment in orphanages and hospitals in the early 1990s.

Most health care workers around the world fear needle stick injuries and are probably aware of the risks of contracting serious blood-borne infections via this route. But they may severely underestimate the risk of patient-to-patient transmission of such infections. Some may think an injection is safe when only the needle is changed between each patient. But a reused syringe also may contain tiny amounts of blood, enough to cause infection with a deadly

blood-borne pathogen. Recent studies where injection practices were directly observed found that about 50 percent of all injections given in developing countries are done with syringes that were not sterilized.

In wealthy countries unsafe injections were largely eliminated with the introduction of plastic disposable syringes—but in developing countries the widespread reuse of disposables is a problem. In poor countries people may not be willing to throw away a plastic syringe after a single use. Syringes are frequently recycled, or illegally repackaged and resold. In addition, disposable syringes often end up in open garbage pits, putting children and others at risk for needle stick injuries leading to infection.

Why do people demand injections?

Since the 1970s anthropologists have documented demand for injections in developing countries and tried to explain the reasons for this popularity. In some cultures the act of penetrating the body with a needle fits well into traditional expectations of cure through ritual scarification or other types of body piercing. Some cultures teach that injections “run in the bloodstream” or that they are “hotter” than other forms of medicine and therefore more effective. And health educators may be at fault as well—syringes are often used as pictorial symbols for medical care, further reinforcing the association between modern medicine and injections.

Unfortunately, many people do not understand that injections are often not the best form of treatment and that they can be dangerous. And while consumers in countries with serious AIDS epidemics seem to be changing their behavior because they fear transmission of HIV, this has not affected their desire for an injection. Now they simply bring their own syringe. It is not necessarily a bad strategy, but does not guarantee safety. It would be better to avoid the unnecessary injections altogether.

Why do health providers administer unnecessary injections?

In some cases an injection is the most appropriate treatment. However, in most cases pills, capsules, or no medicine at all would be more appropriate, safer, and less expensive. But providers are often sensitive to patients’ demands and may feel that it is important to satisfy this desire in order to get the patient’s cooperation on other issues such as sanitation or family planning.



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Injections can also be good business. Studies have shown that some doctors in India earn as much as \$200 per morning (a large sum by local standards) through administering injections for \$1 each in rapid sequence. Also, private-sector providers can control the supply of injectables more easily than oral drugs since it is less likely that the patient will know the name of an injected drug and therefore cannot compare prices among vendors in the market. Sadly, consumers may pay a full day's wages to obtain an injection of questionable therapeutic value and potentially fatal consequence.

Why do health providers administer unsafe injections?

Lack of knowledge is likely the main cause. Many providers are not aware of the necessary safety procedures or the consequences of not following them. However, whether or not a health worker administers an unnecessary or unsafe injection is not solely a question of knowledge and training. His working environment and supplies can also influence behavior. For example, if there are crowds of patients waiting to be seen, health providers may feel pressure to shortcut safety procedures to save time. One nurse in India was required to give 150 to 200 injections in four hours—but was only supplied with ten syringes and 25 needles. Clearly this nurse could not adequately sterilize, considering that she was required to give an injection every minute.

Communities without a quality health center have a special problem—they often depend on traditional healers and “quack doctors” for medical care, including injections. These informal providers have little medical training and may in reality be assistants in pharmacies, drug stores, or even tea shops. Some private injectors even travel a fixed route, offering their services in village market places at regular intervals.

In northeastern Thailand, it was the local rice miller who was the “injection doctor.” He injected the same two drugs, diazepam and vitamin B, for all complaints irrespective of the symptoms. Ironically his main motivation was not to earn money but to help people and increase his social status in the local community. Sadly, he had never been fully trained in safe injection technique. He would carefully boil his needle and syringe for 20 minutes, then place both in a filthy, bloodstained box in preparation for the next patient. Since people like him are not part of the formal health care system, it is extremely difficult to organize training for them or to monitor quality of service.



Photo: D. Douglas/PATH

Even formally trained doctors may not have adequate skills. The Thai study also showed that while doctors knew that blood-borne diseases could be transmitted if the needle was not sterile, some did not know that a dirty syringe could be dangerous as well.

Why do consumers not insist on safe injections?

Again, it is most often lack of information that stops patients from demanding safer injections. But other factors may also come into play. In most cultures, patients and health care providers have unequal status and it may be considered rude to question a doctor's orders. So even if the patient is aware that sterilization is important, and can see that the needle and syringe have not been sterilized, it can be difficult for him or her to insist on safe procedures.

In addition, people often have their own culture-specific interpretations of what constitutes injection safety. They may think that bringing their own "family syringe" equipment to the health clinic ensures safe injections. But "cooking" the equipment at home, as some Ugandans do, is not enough to ensure safety if the equipment is subsequently shared between family members.

What Can You Do?

There are a number of things that can be done to improve injection safety, reduce the number of unnecessary injections offered to patients, and increase safe disposal of contaminated injection equipment and other “sharps.”

First, Talk About the Problem and Learn All You Can

Only within the past few years have we begun to understand the true extent of unsafe and unnecessary injections worldwide. Now that we know, it is time to talk openly about the problem at the international, national, and local levels. A number of new tools and initiatives are being developed to help decisionmakers and clinic managers assess their situations and propose solutions to improve quality of care. One easy way to learn about these tools is from the Safe Injection section of the Bill and Melinda Gates Children’s Vaccine Program website at www.ChildrensVaccine.org/html/safe_injection.htm. This page includes links to the World Health Organization Safe Injection site and many other resources. If you do not have web access, you can write to the Gates Children’s Vaccine Program for more information.

Promote Necessary Injections and Make Certain That Immunizations are Safe

Although 95 percent of all injections are curative (and many are unnecessary), attention must also be given to the 5 percent of necessary, preventive injections. Global immunization is the greatest public health success in history, resulting in unprecedented progress in preventing childhood disease and death. Concern about injection safety should not interfere with vaccination programs. However, several studies have found that even injections for immunization are not always safe. It is possible that the focus on reaching every child has sometimes overwhelmed other concerns such as injection safety. We need to ensure that such essential injections are always given in a safe manner.

Make Good Use of Technological Solutions

Because of new evidence on the association between unsafe injections and blood-borne diseases, the World Health Organization and UNICEF have decided to replace disposable syringes with “auto-disable” syringes in their immunization programs. Auto-disable syringes are specially modified,

disposable syringes that disable themselves after a single use. Unfortunately they are costly compared to standard disposable syringes.

Decisions taken by large-scale multilateral or bilateral donors need to carefully balance issues of safety versus issues of cost and safe disposal. There is still a need to encourage further research and development of affordable and safe injection technologies as well as oral and mucosal vaccine formulations.

Develop Sensible Policy Solutions

Every country and clinic should create clear guidelines and policies related to injection safety and sharps disposal. National and local health care policies can replace injectable drug formulations with oral alternatives and ensure their availability throughout the health system. Health planners must also look into the use of injections in the informal sector so that appropriate interventions can be designed. Health workers need to be adequately trained and supervised and should be given adequate time to explain noninjection treatment options to their patients.

Public education about the dangers of infection from contaminated equipment can also play an important role. Public demand for safer injections will encourage positive change on the part of providers. Accurate, solution-based media messages will also reach untrained, private injection providers and may represent the best means of improving their knowledge and skills. The public sector can also reach out to traditional healers with training and proper equipment. Operations research into the best ways to improve injecting behaviors among these providers could be extremely useful.

Of course, it is important to consider ongoing national efforts to address injection issues and to make certain that interventions for improving injection safety do not adversely jeopardize other health initiatives or essential resources.

Promote a Culture of Individual Responsibility for Injection Safety

“Should I inject or not?” Health workers are faced with this question every day and must be encouraged to ask themselves: “Does this patient truly need an injection?” and “If an injection is necessary, can I do it in a safe manner?”



Injection technique training in Bangladesh
Photo: M. Dorgabekova

If the answer is “no” to either question, they should try to find an alternative way of treating the patient. Health workers should be trained to initiate a dialogue with patients to explain why an alternative treatment is better, and they must be skilled in eliciting and addressing client concerns and feelings. Clinic staff can work with the community to develop local solutions for raising awareness about appropriate injection use and for empowering patients to recognize and seek quality care.

Become Involved in New International Partnerships

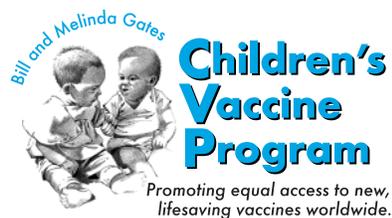
The world is beginning to address the challenge of unsafe injections. As one response, a global network of concerned organizations and individuals was formed in October 1999 to address the problem of unnecessary and unsafe injections. The Safe Injection Global Network (SIGN), hosted at the World Health Organization, was created to raise awareness about the problem, collect data on useful approaches and interventions, share solutions that work, and coordinate a global effort to improve injection safety. To become a member of SIGN or to subscribe to the SIGN Internet forum, send an e-mail to sign@who.int or visit the SIGN Website at www.InjectionSafety.org.

About the Authors

The information in this paper is based on two recent overview articles by the authors. Both are available at www.ChildrensVaccine.org/html/safe_injection.htm.

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