Infectious diseases continue to be a leading cause of disease and death worldwide, and health care workers are at risk of contracting these infections. The spread of infections within health facilities results in large part from the failure of health care workers to wash their hands before and after each patient contact—a lesson learned more than 100 years ago. The epidemic spread of bloodborne viral diseases, including hepatitis B and C, and human immunodeficiency virus (HIV), heightens the importance of working safely in a health care facility. Infection prevention strategies should focus on:

- preventing the spread of infection by cross-contamination (person to person), and
- protecting health care workers at all levels by providing a safer work environment.1

Most infections can be spread before symptoms are present. Therefore, exposure to any patient’s blood or other body fluid through needle sticks or other injuries and splashes into eyes and mouth (mucous membranes) increases the risk of exposure. Many health care workers are only vaguely aware of the risk they face while at work; some still believe that little can be done to protect them.

This article focuses on what health care workers can do to protect themselves (and at the same time their clients) from exposure to infectious diseases. The specific decontamination, cleaning, disinfection, and sterilization procedures required to ensure facilities and equipment remain infection free are not specifically addressed.
“Most infectious agents are transmitted by contact with blood and body fluids and most infections can be spread before symptoms are present. Therefore, it is essential that health care workers treat all patients as if they are infected.”

Compliance with infection prevention guidelines can be strengthened if there is consistent support for safety efforts by program managers. This includes ensuring that identified deficiencies are corrected, dangerous practices are eliminated, and staff are actively encouraged to suggest better safety practices. It also is important that supervisors regularly provide feedback and reward appropriate infection prevention practices, and that role models, especially physicians and other senior staff, support recommended infection prevention practices and model appropriate behavior.

Finally, educational programs geared at problem-solving—not just providing information—and addressing psychosocial factors (minimizing stress, conflict of interest between providing the best patient care and protecting oneself from getting an infection) do not use them regularly. This is in part due to the mistaken belief that HIV is largely confined to certain “at-risk” groups—sex workers, intravenous drug users, or homosexuals—and to urban areas. While this may have been true several years ago, in 1996 WHO estimated that worldwide there were more than 22.6 million people infected with the AIDS virus and that this virus is increasingly affecting the heterosexual population as well as spreading to rural areas.

Other factors also contribute to the lack of compliance, including the perception that health care facilities are risky places to work and little can be done to make them safer, and the belief that there is a conflict of interest between providing the best patient care and protecting oneself from getting an infection. In many settings a lack of sufficient staff and inappropriate staff mix to meet client needs magnifies the problem.

Making Infection Prevention Programs Work

Implementing effective strategies to ensure that health care workers follow infection prevention guidelines is crucial to preventing the spread of infection. Education and other efforts intended to make the health care facility safer should be directed to all health care workers—not just physicians and nurses. In some countries housekeeping staff have a rate of needlestick injuries second only to operating room staff. This is due in large part to used needles being incorrectly discarded combined with housekeeping staff not being taught how to protect themselves.

Handwashing and Using Gloves: Crucial for Any Health Care Worker

Routine handwashing for 10 to 15 seconds before and after patient contact may be the single most important procedure in preventing infections. Using soap and water when available or an alcohol/glycerin (waterless) handrub is effective. Health care workers in the United States have been found to wash their hands only 40 percent of the time, even in intensive care units, where patients often are most vulnerable and resistant organisms most common.

Gloves should be worn by all health care workers prior to contact with blood and other body fluids from any patient. This also includes the staff who clean up after a procedure and wash instruments. The type of glove used depends on the task. Sterile gloves are required for surgery; inexpensive, disposable exam gloves for performing pelvic examinations; and thick utility gloves for washing instruments, cleaning up spills, and disposing of medical waste. Gloves should be changed after each contact. For example, after changing a dressing staff should remove their gloves and wash their hands before writing up notes or doing anything else.

If surgical gloves are being reused (either sterile or high-level disinfected), operating room staff should “double glove” for procedures where blood or body fluid contamination is routine (for example, vaginal deliveries or Cesarean sections) because invisible tears can occur with reprocessing.
emotional strain, and interpersonal problems) can lead to better compliance and improved health worker safety.\(^3\)

**How Can Health Care Be Made Safer?**

Most infectious agents are transmitted by contact with blood and body fluids and most infections can be spread before symptoms are present. Therefore, it is essential that health care workers treat all patients as if they are infected. The barrier precautions described and illustrated on this page should be used routinely by all health care workers with all patients:\(^9\)

Barrier precautions will provide sufficient protection when working with almost all patients. Isolate patients only if secretions (airborne) or excretions (urine or feces) cannot be contained. This would include, for example, patients who have active tuberculosis.

Infection prevention precautions are a part of every procedure. In women's health clinics, for example, gynecological procedures, even pelvic exams, can expose health workers to body fluids. Listed below are the specific infection prevention procedures that should be followed during a pelvic exam:

- Wash hands thoroughly with soap and water before each examination.
- When possible, have the client wash her genital area before doing the pelvic examination.
- Use clean, high-level disinfected (or sterilized) instruments and surgical gloves (both hands). Alternatively, examination gloves can be used.
- Properly dispose of waste material (gauze, cotton, and disposable gloves).
- Decontaminate instruments and reusable items immediately after using them.
- Wash hands thoroughly with soap and water after removing gloves.

Finally, while not specifically a barrier precaution, when possible health care workers should take advantage of available immunizations, especially hepatitis B vaccine. Being vaccinated protects not only the health care worker but also fellow workers, patients, and the health care worker's family.

**Summary**

It is increasingly important that health care workers know and use simple, inexpensive practices that can markedly reduce the risk of acquiring and spreading a serious, life-threatening disease. It is the responsibility of all health care workers to help create a safer environment for patients and fellow health care workers.

8. Griffin, K. They should have washed their hands. Health 82-90 (November/December 1996).

PRODUCT NEWS

The Female Condom: For Women and Men

The female condom is the first barrier method that provides dual protection against pregnancy and sexually transmitted diseases (STDs) and is worn by women. It offers an additional contraceptive option to women and men, particularly those at risk of STD. The female condom is a polyurethane plastic with a ring made from the same material at either end. The closed-end ring is used to insert the device into the vagina and to hold it in place at the cervix; the open-end ring stays outside the vagina after insertion and covers the external genital area (see illustration on right).

The female condom was first marketed in Switzerland in 1992; as of 1996 it was available in 13 countries including several European nations, the United States, South Africa, Thailand, and Korea. Given the unmet contraceptive need and high rates of STDs, including human immunodeficiency virus (HIV), among women in many developing countries, there is renewed interest in the female condom among the international health community. A 60-country survey by UNAIDS estimated the global demand for female condoms (at affordable prices) at 13 million for 1998.

Effectiveness in Pregnancy and STD Prevention

The female condom is effective in preventing pregnancy when used correctly and consistently at every act of intercourse; with typical use, failure rates increase. One study estimates that about five percent of women always using the female condom correctly (perfect use) become pregnant during the first year. With typical (non-perfect) use for one year, the failure rate increases to 21 percent. A study of 377 women from six U.S. and three Latin American sites reported a 6-month cumulative accidental pregnancy rate of 15 percent among typical users of the female condom (12.4 percent among U.S. women and 22.2 percent among Latin American women). Among perfect users of the female condom, the 6-month failure rate dropped over threefold, to 4.3 percent (U.S. women 2.6 percent and Latin American women 9.5 percent). Six-month discontinuation rates were 55 percent for Latin American women and 32 percent for U.S. women.

Few data are available on the degree of protection against STDs provided by the female condom. Use-effectiveness results from two studies are promising, however. In a U.S. study that examined the rate of recurrent vaginal trichomoniasis in 104 women who had been treated for the infection, the reinfection rate was zero among 20 perfect users of the female condom, about 15 percent among 34 non-perfect users, and 14 percent among 50 controls (non-users) following a 45-day period. Laboratory studies have found that the female condom is impermeable to STD-causing organisms, including HIV.

New evidence from a study of female sex workers in Thailand suggests that the availability of female condoms may reduce the rate of STDs in this population, presumably by reducing the number of unprotected sex acts. Female sex workers who were offered both female and male condoms had a 34 percent reduction in incidence of STDs and 25 percent reduction in the number of unprotected sex acts compared to their counterparts who were offered the male condom only.

The female condom, when properly used, may offer better protection against transmission of some.
STDs than male condoms. This is because the female condom covers more of the external genitalia than the male condom. In addition, the polyurethane female condom is sturdier and more resistant to breakage than male latex condoms.

User Perspectives

Acceptability studies of the female condom have been conducted in both developed and developing countries, although generally with a small number of participants. While acceptability results have varied, women and men in many settings report liking the female condom “very much” or “fairly well” (see Table 1). When individuals are asked how the female condom compares to the male condom, as few as 40 percent and as many as 100 percent of women and men have stated they prefer the female condom to the male condom.1

The acceptability of the female condom is affected by its aesthetic qualities: a specific concern women often mention is the appearance and feel of the protruding outer ring.1,6 Other concerns about the device have included: difficulty with insertion; inner ring causes pain for both partners; produces noise during sex; and the device can become compressed inside the vagina during intercourse.1

Is the female condom really a female-controlled method? A key reason for developing the method was to provide women with a barrier method they did not have to negotiate with their partner. While use of the female condoms generally is initiated by women, partner cooperation and willingness is essential for sustained and effective use. Partner resistance frequently is cited for non-use or discontinuation of use. On the other hand, women also have often found that their partners like the female condom and prefer it to other methods (see Table 1). Anecdotal data from social marketing projects to date reveal that between 20 percent to 50 percent of purchasers of female condoms are men.7

Availability and Cost Issues

While the female condom is not a perfect method, demand is strong among certain groups of women and men. Yet in developing countries, female condoms are not widely available.

One way to increase access to female condoms is through social marketing. Until recently, social marketing of the female condom has been limited to small-scale efforts, generally with a focus on preventing STDs/HIV. For example, Population Services International (PSI) test-marketed a total of 96,000 female condoms in five countries in 1996—Bolivia, Haiti, Guinea, South Africa, and Zambia.7 The female condom was positioned as an effective alternative to the male condom to protect against both unintended pregnancies and STDs/HIV. It was made available in pharmacies and small general stores and through outreach workers. It was marketed mostly via interpersonal communication, with limited mass media support, and targeted primarily to sex workers and university students.7

A large-scale social marketing project in Zimbabwe launched in July 1997 promoted female condoms as the "care contraceptive sheath: for women and men." The care condom has been made available through pharmacies and clinics in all major towns and cities of Zimbabwe at a price equivalent to about US$0.14 per condom. More than 100,000 were sold within the first four months.7

### TABLE 1

Summary of Selected Acceptability Studies in African Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of Participants</th>
<th>User Acceptability</th>
<th>Partner Acceptability</th>
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</table>
| Kenya       | 100 women; 46 male partners | • 93% were always satisfied with female condom  
• 86% liked using it very much | • Men generally found female condom acceptable; one man reacted violently when a woman suggested using it |
| Malawi      | 57 couples; 46 CSWs†  
46 CSWs† | • 95% of non-CSW women and 100% of CSWs liked female condom  
• 81% of study participants preferred female condom to male condom | • 96% of men liked female condom very much or fairly well  
• 67% preferred it to male condom;  
93% said they would use it again |
| Uganda      | 100 CSWs; 90 urban and 30 rural women | • 90%-100% of CSWs, 90% of urban women, and 100% of rural women liked female condom very much or fairly well | • 90% of CSWs and rural women said their steady partners also liked it very well or fairly well |
| Zimbabwe    | 89 CSWs, 84 urban and 23 rural women | • More than 90% of all women liked it very much or fairly well  
• 66% of urban women, 100% of rural women, and 80% of CSWs preferred it to male condom | • More than 75% of urban and rural women said their steady partners liked it  
• About 75% of CSWs said their clients liked it |

† CSW = commercial sex worker

Adapted from WHO, 1997.1
The high cost of female condoms compared to male condoms is a barrier to use. When available through regular commercial channels in developing countries, the female condom costs between US$2 and $3—an unaffordable price for most women.\(^1\)\(^,\)\(^2\)\(^,\)\(^8\) UNAIDS has negotiated a preferential public sector price of about US$0.63 per condom, but this still is too expensive for many women around the world. Social marketing research results suggest that consumers were willing to purchase the female condom only at much lower prices, for example US$0.03 in Zimbabwe, $0.06 in Haiti, to $0.32 in Bolivia.\(^1\)\(^,\)\(^6\)\(^,\)\(^7\) These prices generally are still higher than the prices of male condoms, however.

Because of its high cost, women reportedly often reuse the female condom (which is approved for a one-time use only). Reuse raises a number of concerns, including the potential for breakage, strength, permeability to microorganisms, and possible microbial contamination.\(^1\) Issues related to reuse currently are being investigated.

**Program Implications**

When used correctly and consistently, the female condom can be quite effective in preventing pregnancy and STDS. Increasing data on acceptability and demand for the device suggest that it can be acceptable to certain women and men. In order for the method to be made more accessible, the prices must be lowered and it must be promoted carefully. Given that men's cooperation in its use is crucial, promoting the female condom to both women and men is important in many settings. It also is important to address user concerns about aesthetics and improper use of the female condom. As with all methods, women and men are more likely to understand and use the female condom properly when: method use is clearly explained by trained clinic or community-based workers; potential users are informed that it requires some practice to use comfortably; and support, counseling, consistent use, and follow-up are emphasized. Lastly, it is important that research on the effectiveness and acceptability of the female condom continues so that appropriate use can be further defined.

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8. AIDSCAP. The female condom: from research to the marketplace (August 1997).

**SAFETY**

**Vaginal Douching: Unnecessary and Potentially Harmful?**

Vaginal douching—rinsing the vagina for hygiene, to ease symptoms of infection, or in an effort to prevent pregnancy—is an ancient practice performed by millions of women around the world. In the United States alone, it is estimated that more than 20 million women douche regularly either with a commercial or homemade preparation. Douching also is common among women in African and Asian cultures. In these cultures, dry substances, such as herbal leaves or powders, also are commonly used to treat symptoms of infection or for sexual enhancement (see box, page 7). Few studies have addressed the risks and benefits of douching, and the results of available studies have been inconsistent.

A recent meta analysis of studies on douching published within the past 30 years indicates that frequent douching may be linked to adverse health effects. The meta analysis included primarily studies from the United States; some studies from Latin America were also included. All studies adjusted results for confounding factors such as number of sexual partners, marital status, and frequency of intercourse. The analysis found that douching once a week or more was associated with a significantly increased risk of pelvic inflammatory disease (PID) and a moderate risk of ectopic pregnancy. The analysis also found a somewhat increased risk of cervical cancer among women douching frequently, but this result was less clear.\(^1\) The implications of this meta analysis are important given that the practice is so common and that many health providers and women are largely unaware of potential risks associated with douching.

Why do women douche? A U.S.-based study found that among urban women the most frequently cited reason given for douching was hygiene—to feel clean after sex and/or after menstruation.\(^2\) About half of the women in this U.S.-based study douching with a
commercial preparation, 30 percent used a home mixture of vinegar and water, 10 percent used water alone, and 10 percent used other preparations. Overall, douching was associated with three characteristics: lower socio-economic class, greater risk of STD, and symptoms suggestive of vaginal infection.

Despite the perception that douching promotes genital hygiene, most health providers advise that douching is not necessary after a menstrual period or after sexual intercourse since the vaginal wall is self-cleansing. Unless a woman has a medical condition for which a clinician has specifically prescribed douche, the practice is unnecessary and may even be harmful.

**Possible Risks of Douching**

Although only two case-control studies during the past 30 years have specifically examined the issue, a link between douching and PID appears to be likely. Results from these studies—which controlled for potentially confounding factors including number of sexual partners—suggest that women who douche have a 73 percent increased risk of PID compared to women who do not douche.1 The pooled overall relative risk from these two studies was 1.73 (95% confidence interval [CI]=1.07 - 2.79). The more frequently a woman douches, the higher her risk of having PID. A possible mechanism for this increased risk is that douching helps pathogens ascend through the cervix to the uterus and fallopian tubes. More research is required before a cause-effect relationship is confirmed.

The link between douching and ectopic pregnancy also appears to be supported by study results. Pooled results of five hospital-based case-control studies found that women who douche had a 76 percent increased risk of having an ectopic pregnancy compared with women who did not douche.1 Again, these studies were controlled for confounding factors.

Some researchers suggest that douching may be more likely to promote ascending infections at certain times of the menstrual cycle.1 Immediately after menses, the cervical os is small and contains a plug of thick, sticky mucus that blocks the passage of many pathogens. As ovulation approaches, the os opens and the mucus thins and washes away more easily. Therefore, researchers suggest that douching may be riskiest around the time of ovulation. Another influencing factor may be the pressure with which douche solution is applied.

Since the 1930s, douching has been suggested as a possible risk factor for cervical cancer. Results of studies have been inconsistent, however. Pooled results of six population-based case-control studies found a weak overall association between douching and cervical cancer (relative risk =1.25, 95% CI = 0.99 - 1.59). A more significant association was found among women who douch at least once a week (adjusted relative risk = 1.86, 95% CI = 1.29 - 2.68). The possible biological mechanism for the link is unclear, however, and concern has been raised that douching may simply be a marker for other risk factors for cervical cancer, including HPV infection.1

Douching also can affect fertility. Among 849 married, parous women in the United States, douching resulted in reduced fertility.3 Women who douched were 30 percent less likely to become pregnant each month they attempted pregnancy. Young

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**Dry Sex Practices: a Risk for STDs?**

Dry sex is a common cultural practice in many Southern, Central and West African countries. Dry sex refers to the practice of using herbs, pharmaceutical agents, absorbents such as cloth, or other substances to dry and tighten the vagina before intercourse. A wide variety of substances are commonly used including soaps, ground stones, toothpaste, and many kinds of herbs. Women engage in these practices for a variety of cultural reasons and often learn them from older women or family members, or as part of their initiation rites as young girls. The most common reason cited for dry sex is to enhance sexual pleasure for the male partner, but women also report using these herbs and substances to clean the vagina before or after sex and to treat symptoms of vaginal infection.

Given the high incidence of sexually transmitted disease infection in these regions, researchers and AIDS prevention programs are interested in the effect of these substances on vaginal tissue and implications of their use on condom use. Some studies have shown an association between use of intravaginal substances and HIV; others have not. In Zaire, a study among 377 sex workers found that introduction of any product into the vagina was associated with HIV seropositivity (odds ratio 2.4; 95% CI = 1.2 - 4.8), although use of specific intravaginal agents for tightening the vagina was not.3

In general, the substances used to promote dry sex can cause vaginal inflammation, peeling of vaginal tissue, and penile or vaginal abrasion, all of which can increase risk of STD/HIV transmission. The herbs and other substances also may mask symptoms of existing STDs, thereby increasing the risk of HIV transmission. Dry sex practices also may affect condom use and effectiveness. In a study among HIV/AIDS peer educators in Zimbabwe, women reported that condoms often broke when used in conjunction with dry sex practices, either because the vagina was too tight, or possibly because of chemical or abrasive interaction with the substances.4

Even though only limited information is available, health providers working in regions where dry sex practices are common should be prepared to discuss these practices with their clients, and should advise clients that the practices may put them at increased risk of STDs.4
women who douched had significantly greater reduction in fertility than older women. The mechanism for this reduced fertility is unclear, although altered vaginal pH or tissue changes have been suggested. Even though douching seems to result in reduced fertility, its effect is slight and it should not be relied upon to prevent pregnancy.

Results of the few studies that have evaluated douching and risk of STD infection suggest that frequent douching may be associated with an increased risk of STDs and HIV, although it also is possible that women at risk of STDs are more likely to practice douching. In Indonesia, a study of 599 pregnant women attending a prenatal clinic found that the presence of STDs was associated with douching habits.\(^6\) Compared to women who never douch, women who always douch with a commercial preparation or with a traditional substance called betel leaf had a substantially increased risk of sexually transmitted disease (odds ratio 9.4, 95% CI=1.8 - 50.3). Douching with water only after sex was not associated with STD risk.

Researchers also are evaluating a possible association between frequency and type of douche and HIV infection. In a study of 397 women attending an STD clinic in the Central African Republic, women douching with a noncommercial traditional preparation were more likely to be infected with HIV than women who had never douch (odds ratio 1.7, 95% CI=1.0 - 3.0). On the other hand, women douching with commercial antiseptics were less likely to be infected with HIV (odds ratio 0.6, 95% CI=0.4 - 0.9). In all analyses, researchers adjusted for potentially confounding factors such as marital status, number of sexual partners, and frequency of intercourse.\(^3\) Additional research is needed to confirm these results.

**Conclusion**

Although the data on the effects of douching are limited, it appears that douching may be more harmful than helpful. Frequent douching seems to be associated with a greater likelihood of STDs, PID, and ectopic pregnancy. Women who douche also experience reduced fertility. More research should be carried out to confirm findings, but in the meantime, women should be counseled that douching is not necessary and may be harmful.

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