



Circumcision: The Good, the Bad and American Values

Mary E. Buie

ABSTRACT

National statistics estimate that 1.2 million newborn males are circumcised annually in the United States (70% to 80%). Such values as sanctity, equity, fraternity, paternity and liberty affect circumcision rates in America. The value of sanctity allows freedom of religious beliefs and traditions that often overcome medical impetus in decision-making with regard to circumcision. A lack in the value of equity allows socioeconomic status and cost to impact whether or not babies are circumcised. The value of fraternity allows individual and population benefits through decreased urinary tract infections and decreased sexually transmitted infection transmission. The value of paternity allows the attempt to protect newborn males, an effort inherent with risk. Circumcision is an elective surgery, and the value of liberty continues to allow Americans to determine their own stance and action regarding circumcision. The use of this procedure must be evaluated on an individual basis. Unbiased, comprehensive preoperative information must be provided to ensure informed decisions. Education is the key toward a decision about the value of circumcision, and health educators play a pivotal role in the informed decision-making process.

INTRODUCTION

Male circumcision, an elective procedure, involves the surgical removal of the skin that covers the tip of the penis. Circumcision is uncommon in Asia, South America, Central America and most of Europe, with only 5% to 6% of males circumcised in Great Britain.^{1,2} However, about one-quarter of the world's male population is circumcised, largely concentrated in the United States, Canada, countries in the Middle East and Asia with Muslim populations, and large portions of Africa.³ National statistics estimate that 1.2 million newborn males are circumcised annually in the United States (70% to 80%).^{1,2} Why do the majority of Americans readily adopt

this surgical procedure, whereas other countries do not? This paper will review the procedure, explore values, and delineate the role of health education in relation to neonatal circumcision.

PROCEDURE

In the U.S., health professionals and licensed religious individuals perform circumcisions utilizing one of three instruments: the Gomco clamp, the Plastibell or the Mogen clamp. Physicians often use the Gomco clamp, a metal clamp removed after use.⁴ Whereas health professionals report the Plastibell to be easier to use, it often results in inflammation and exudate.⁴ This plastic device remains in place until it

falls off during healing. The Mogen clamp, or shield, is traditionally used at a *bris*, or the Judaic circumcision ritual.⁴ Its benefits include low blood loss, low incidence of infection and superior cosmetic results.⁴

Circumcision involves the following steps: 1) estimating the amount of skin to be removed, 2) dilating the preputial orifice, 3) freeing the foreskin from the glans of the penis, 4) positioning the device, 5) waiting for hemostasis to occur, and 6) amputating the foreskin. A suture is

Mary E. Buie, MPH, MS, is a USF Doctoral Student, 2403 Coventry Avenue, Lakeland, FL 33803; E-mail: mbuie@hsc.usf.edu.



sometimes needed to ensure hemostasis.^{1,4} Newborns must be stable and healthy to undergo circumcision. This surgery is not performed on premature infants due to their fragile health status.¹

According to the American Academy of Pediatrics, newborns experience pain and physiologic distress if circumcised without anesthesia.¹ Options for pain reduction, in order of increasing effectiveness, include a eutectic mixture of local anesthetics (EMLA cream), a dorsal penile nerve block (DPNB) or a subcutaneous ring block.¹ Traditional techniques utilizing sucrose and acetaminophen are not recommended as the sole method of pain relief.¹ The American Academy of Pediatrics states that adequate anesthesia should be provided if neonatal circumcision is performed.¹

VALUES

Circumcision rates vary across the globe. This may be due to the different values of different cultures, and therefore, values must be taken into consideration in the analysis of circumcision prevalence in the United States. Such values include sanctity, equity, fraternity, paternity and liberty.

Sanctity

Historically, the value of sanctity represented the basis for many newborn circumcisions, as expressed through religion, morality and tradition. This value continues to influence Americans' decisions to circumcise newborn males.

Religion

According to the book of Genesis in the Bible, around 2000 B.C., Abraham made a covenant with God in which God would give Abraham many descendants, and all of the descendants were to be circumcised as a reminder of the covenant. In the Jewish religion, this developed into the traditional *bris milah*, or the circumcision ritual performed on the eighth day of life. Generally, this ritual is performed by a *mohel*, an ordained rabbi licensed by the state to perform circumcision. Judaic rituals still account for a significant portion of circumcisions performed annually in the United States.

Morality

In the past, morality also shaped the practice of circumcision. In the Victorian era, physicians considered circumcision as a cure for impotence, phimosis (a tight or unretractable foreskin), sterility, priapism (painful erection in the absence of sexual interest), masturbation, venereal disease, epilepsy, bed-wetting, night terrors, sexual unrest and homosexuality.⁵ Even in the late 19th century, medical professionals continued to accept circumcision as an effective treatment for many medical maladies, such as masturbation, headache, insanity, epilepsy, paralysis, strabismus (a squint), rectal prolapse, hydrocephalus (water on the brain) and clubfoot.^{6,7} The most common basis for circumcision, as documented throughout history, was the prevention of masturbation, a stance encouraged by Christian prohibitionists against non-procreative sex.⁵ Today, however, the stigmatization of masturbation is diminishing in America, and morality is rarely cited in reference to the decision to circumcise newborn males.

Tradition

Tradition continues to influence the practice of circumcision in the United States. Ethnic traditions influence rates of circumcision, and reported rates of circumcision vary. In America, some reports indicate that Caucasians (81%) are considerably more likely to be circumcised than African-Americans (65%) or Hispanics (54%).^{1,8} However, the Centers for Disease Control and Prevention (CDC) reports that this social disparity does not exist. In the past twenty years, the rate of circumcision among Caucasians remained at 65.8%, with little variation between 1979 and 1997.⁹ During this same time, the rate of circumcision among African-Americans increased from 57.9% in 1979 to 67.3% in 1997.⁹ Circumcision rates vary by geographic region within the United States, as well. In the U.S. in 1979, circumcision rates, in descending order, were as follows: the midwest region (74.3%), the northeast region (66.2%), the west (63.9%), and the south (55.8%).¹⁰ By 1997, these rates remained relatively stable

with slight to moderate increases for the midwest region (81.6%), the northeast region (68.3%), and the south (64.5%).¹⁰ However, the western region (38.0%) decreased by 25.9%.¹⁰ The CDC attributes this decline to the increased birth rate among Hispanics in this region, because they are traditionally less likely to receive circumcisions than Caucasian and African-American infants.¹⁰ Cultural and family traditions related to ethnicity continue to influence the rate of circumcisions performed annually in the United States.

Equity

A lack of equity plays a part in the decision to circumcise, since the cost of the procedure remains a barrier to some individuals. The average charge for circumcision in an office setting between three days and nine months of age is \$196, and the same procedure performed in the operating room costs \$1,805.⁴ Estimated costs of circumcision are between \$150 million and \$270 million in the United States annually.¹ Not all insurance companies cover circumcision, which creates a socioeconomic status disparity in the practice of circumcision.

Fraternity

Fraternity is concerned with maximizing the benefit to society. Circumcision, an individual and highly personal procedure, does benefit the individual, as well as the general population. Circumcision benefits include a decreased risk of urinary tract infection (UTI) (an individual benefit) and a decreased risk of sexually transmitted diseases (STDs) (an individual and population benefit).

UTI

In 1993, a meta-analysis of studies revealed an association between the lack of male circumcision and risk for urinary tract infection among male infants.^{3,11} In all of the nine studies identified, uncircumcised infants were more likely to develop UTIs than circumcised infants, with risk ratios ranging from 5 to 89 infants.^{3,11} Whereas similar findings have been reported in older children and adults, the greatest risk for UTI occurs in infants younger than one year of



age.^{1,3,11-13} The increased risk associated with uncircumcised infants may be due to preputial colonization of uropathic bacteria, a condition that attenuates over time.^{2,3} UTIs are treatable, but they may lead to expensive, and sometimes invasive, investigations.³ Renal injury also may result from this condition.³

Penile cancer

In the United States, an estimated 750-1000 cases of penile cancer occur annually.^{3,14} Uncircumcised males account for almost all of these cases, and the rate of mortality may be as high as 25%.^{3,7,14} A rare disease in the United States, the age-adjusted annual incidence of penile cancer is 0.9 to 1.0 per 100,000 males.^{1,15} This rate increases in countries in which the majority of males are uncircumcised, such as Brazil (2.9 to 6.8 per 100,000) and India (2.0 to 10.5 per 100,000).^{1,16,17} Among five published studies examining penile carcinoma, essentially all men with the disease were not circumcised as infants.³ Circumcision later in life was shown to be ineffective in the prevention of penile cancer.^{3,18} A lack of circumcision also was associated with the development of penile intraepithelial neoplasia, a precursor to penile carcinoma in some males.^{3,19}

Human papillomavirus (HPV) may mediate the increased susceptibility to penile carcinoma among uncircumcised males.^{3,20,21} There is an association of HPV DNA and genital warts with penile cancer; however, the percentage of penile cancers with HPV DNA is lower than that of four other anogenital tumors (anus, cervix, vulva and vagina).^{1,22} Researchers interpret this outcome to imply that sexual transmission may be less of a factor in the genesis of squamous cell carcinoma of the penis than of these other cancers.^{1,22} Another suggestion is that HPV is a co-factor for penile cancer, requiring the presence of other conditions for progression to malignancy.¹ Regardless, a study conducted by the International Agency for Research on Cancer (IARC) determined that the odds that circumcised men had an HPV infection were about 60% lower than the odds that uncircumcised

men had an HPV infection.²³ This same study concluded that the odds of having cervical cancer (almost certainly a sexually transmitted disease, caused by oncogenic strains of HPV) among monogamous women with six or more lifetime sexual partners were reduced by about 60% if the partners were circumcised.²³ Risk factors associated with penile cancer include smoking, genital warts, more than 30 sexual partners and phimosis (a tight or unretractable foreskin).⁴

Human Immunodeficiency Virus (HIV)

In 1994, a review of 30 epidemiological studies revealed a statistically significant association between male circumcision and risk for HIV infection in 18 studies from six countries.^{3,24} Four studies from four countries found a trend towards an association, and four from two countries found no association.^{3,24} A review of 11 studies³ since that time revealed a statistically significant association among eight studies,²⁵⁻³² a trend towards an association in one study,³³ no association in one study,³⁴ and an increased risk with circumcision in one study.³⁵

Many of these studies were conducted in Africa, and some argue that this may skew the data in relation to its use in developed countries.^{6,37} Cultural differences impact circumcision status differently in the United States. In 1997, Marck determined that uncircumcised males, in circumcising areas of Africa, face discrimination in work, housing, marriage and sexual relations.⁶ A significant percentage of these men resort to prostitutes, increasing their risk of exposure to HIV and other STDs.^{6,37} Even further, circumcision causes most tetanus infections,³⁸ spreads tuberculosis³⁹ and results in a high number of severe complications and death in Africa.^{40,41} Therefore, cultural differences related to the practice of circumcision in Africa may be inapplicable in the United States.

Genital herpes

Genital herpes is one of the most prevalent STDs worldwide, most frequently caused by herpes simplex virus type 2 (HSV-2).⁴²⁻⁴⁴ A review of epidemiologic

studies³ revealed that two studies reported statistically significant associations between lack of circumcision and genital herpes,^{45,46} and four studies reported no association.^{8,47-49} Another study determined that there is an association in women between HSV-2 infection and a history of intercourse with an uncircumcised partner.⁴² Uncircumcised men appear to be at higher risk for the acquisition of genital herpes.^{42,45,46} Risk factors for genital herpes include race, age, smoking, douching, a greater number of lifetime sex partners, a history of intercourse with an uncircumcised partner, the presence of vaginal group B *Streptococcus* and abnormal vaginal flora.⁴²

Other STDs

Studies assessing the relationship between gonorrhea and circumcision and the relationship between chlamydia and circumcision present inconclusive results. A statistically significant association between circumcision and gonorrhea was reported in five studies,^{45,48,50-52} and two studies reported no association.^{8,53} For chlamydia, two studies reported significant association with lack of circumcision,^{50,54} three reported increased risk with circumcision,^{8,53,55} and three reported no association.^{8,48,49} At least 11 studies provide strong evidence indicating a significant association between ulcerative STDs, such as syphilis and chancroid, and lack of circumcision.^{3,29,48,52,55-61}

Several theories exist as to why circumcision lowers the risk of certain STDs like syphilis, but not others. These include the following: 1) trauma of the intact foreskin during sexual intercourse might produce microscopic abrasions that increase the susceptibility to STDs, 2) the environment under the foreskin might enhance the survival of certain infectious agents, prolonging exposure to them, 3) the epithelium of the glans of uncircumcised men may be thinner and less cornified than in circumcised men, providing less of a physical barrier to microbes, and 4) non-specific balanitis, more common in uncircumcised men, may predispose to certain STDs due to an inflammatory response.^{24,48,62}

Whereas the studies examining the



association between lack of circumcision and STDs provide conflicting evidence, circumcision appears to have protective effects against certain STDs.^{2,63} Therefore, the value of fraternity encourages individual circumcisions in the goal of population-wide prevention of STDs.

Paternity

Paternity involves protecting children because they cannot protect themselves. The value of paternity may be viewed from two angles. On one hand, circumcision protects newborns from possible physiological problems later in life. On the other hand, circumcision itself may induce physiological problems in the newborn male.

Problems without circumcision

Neonatal circumcision may prevent physiological problems later in life, including the following conditions usually seen in adults: balanitis, posthitis, phimosis, paraphimosis, localized condyloma acuminata and localized carcinoma.² Balanitis (inflammation of the preputial skin) and posthitis (inflammation of the glans penis) are often associated with diabetes.² Balanitis may also result from the lodging of foreign objects under the foreskin of the penis, as seen with the lodging of sand under preputial skin in uncircumcised American soldiers during World War II.⁶⁴ Phimosis, a tight or unretractable foreskin, can be treated with topical steroids, but circumcision is often the only treatment offered.⁴ Paraphimosis is retention of the preputial ring proximal to the coronal sulcus.² This condition may result in edema of the prepuce, potentially disturbing perfusion, leading to ischemic pain, cyanosis and, if left untreated, to skin loss and gangrene.² After inflammation decreases, circumcision is recommended.² Circumcision is also suggested to treat dermatologic conditions of the foreskin, such as condyloma acuminata and low-stage tumors of malignant basal carcinomas or squamous cell carcinomas.² Due to these indications, circumcision of newborns facilitates genital hygiene throughout life under varying environmental conditions.²

Problems with circumcision

Complications may result in 1.5% to 5% of circumcisions, and extreme rates range from 0.06% to 55%.² This variation may be due to geographic and cultural differences in the literature. One U.S. study compared the risks from circumcision during the first month of life with those for uncircumcised infants.⁶⁵ For 100,157 circumcised males, there were 193 complications (0.19%).⁶⁵ These complications included 62 local infections, 8 cases with bacteremia, 83 cases with hemorrhage, 24 cases of surgical trauma and 20 UTIs.⁶⁵ The complications in the 35,929 uncircumcised infants were all related to UTIs.⁶⁵ Another study evaluated complications from circumcision performed by medically trained or untrained operators.⁶⁶ Traditional, or medically untrained, circumcisers were responsible for 85% of the complications.⁶⁶

In the United Kingdom, the Medical Defense Union addresses specific issues regarding the complications associated with circumcision.² These include hemorrhage, meatal stenosis, amputation of the glans and infection, among others.²

Hemorrhage

Bleeding, the most common complication from circumcision, accounts for 0.1% to 35% of cases.² Most cases are minor, responding to gentle pressure. Inadequate hemostasis, blood coagulopathy or anomalous blood vessels may lead to excessive bleeding.² Pressure, electrocautery and, infrequently, blood transfusions may be required in these cases.²

Meatitis and meatal stenosis.

Meatitis frequently occurs at a rate of 8% to 20%.² The removal of the prepuce exposes the glans to ammoniacal substances present in urine-soaked diapers, leading to irritation and injury of the external urethral meatus.² As a result, the meatus may be scarred, leading to meatal stenosis which predisposes the infant to UTI.² Meatotomy may alleviate the symptoms associated with this complication.²

Glans amputation

Glans amputation is rare, but it may be the most serious complication.² Because of

the amount of vascularization associated with the distal glans tissue, grafting is recommended in such amputation injuries.^{2,67,68}

Infection

Infection occurs in about 10% of patients, making it the second most common complication from circumcision.² Local therapy may attenuate most inflammation cases, but in severe bacterial infections, necrotizing fasciitis, staphylococcal 'scalded skin' syndrome, impetigo, osteomyelitis, bronchopneumonia and meningitis may occur.²

Other complications

Other complications from circumcision may include urethral injuries, surgical trauma and operative complications, phimosis after circumcision, skin bridges, inclusion cysts, chordee and penile lymphoedema.² Whereas local anesthesia should be utilized with neonates undergoing circumcision, older children and adult men are usually circumcised under general anesthesia, providing the possibility of additional complications.²

Liberty and the Role of Health Educators

Americans value liberty and the freedom of choice. Health educators are in a position to ensure that such liberties are maintained during the decision-making process regarding circumcision. Circumcision is elective surgery. In 1982, McDermott outlined patient-centered counseling objectives that retain their applicability over twenty years later. First, health educators must provide unbiased information regarding circumcision and its alternative, noncircumcision.⁶⁴ This information may include procedural options, as well as the religious, social, traditional and aesthetic origins of circumcision.⁶⁴ Educators must remember, however, that comprehensive preoperative information *without* external medical, societal or religious pressures is essential to the informed decision-making process. Second, the health educator must detail the risks and benefits associated with circumcision and noncircumcision.⁶⁴ The educator, in conjunction with the physician, must clearly explain the indication for



circumcision in the individual case, the surgical technique, the potential hazards (with the procedure and with local anesthesia), and the plan of action in the case of complications.³ Thirdly, the health educator must allow and encourage a free choice between the two alternatives.⁶⁴ Through the use of these measures, health educators may ensure an informed decision regarding circumcision, as well as a fair and just exercise of the value of liberty.

Informed decision-making begins with the health educator/prospective parent discussion. These discussion sessions have traditionally taken place in one of three ways: during prenatal visits, during hospital-based prenatal classes, or during hospital-based postpartum visits.⁶⁴ Such avenues remain vital pathways toward educating and informing prospective parents about prenatal and birthing issues; however, they may not be as effective in the dissemination of circumcision information. Health educators miss opportunities during prenatal visits, which often occur between physicians and prospective parents only, with no health educator involved. This generally results from the absence of health educators on staff at the physician office/clinic, yet it yields another missed educational opportunity. Health educators also miss opportunities during hospital-based prenatal classes. The number of women enrolled in hospital-based prenatal classes is declining, possibly due to the increased prevalence of epidurals used during delivery (C. Wachdorf, PhD, CNM, oral communication, September, 2004). Regardless of the reason, fewer women in these classes mean greater missed opportunity to inform. Finally, health educators miss opportunities during hospital-based postpartum visits. The parental decision to circumcise is often made before or early in pregnancy.^{69,70} If health educators wait until after delivery to discuss the issues related to circumcision, generally the parental decision has already been made, whether it is an informed decision or not. This lack of timeliness results in additional missed opportunities. These methods of communication are still pri-

mary goals of health educators, but we must also look beyond these avenues, and beyond solely prospective parent education.

Society must be educated about circumcision. Health educators know the importance of education prior to presentation of the problem. There is a lack of common knowledge regarding circumcision, not only by John Q. Public, but also by health educators. Ask your colleagues, friends and family about circumcision. How much do they know? How much do you know? It is ironic that the topic of circumcision is diminishing in health education, even as the procedure becomes increasingly accepted and performed in American society. Comprehensive discussions of circumcision in public health classes, human sexuality classes, community classes, clinics, through public health campaigns, and especially by word-of-mouth are vital to a renewed health education effort regarding circumcision. This effort will increase the public awareness of circumcision, as well as its implications for society, which affect the values of sanctity, fraternity, paternity and liberty. The American population must be knowledgeable about the pros and cons of circumcision, and it is the responsibility of health educators to bring this issue to the forefront of public health and health education.

REFERENCES

1. American Academy of Pediatrics. Circumcision policy statement. *Pediatrics*. 1999; 103: 686-693.
2. Gerharz EW, Haarmann C. The first cut is the deepest? Medicolegal aspects of male circumcision. *BJU Int*. 2000; 86: 332-338.
3. Moses S, Bailey RC, Ronald AR. Male circumcision: Assessment of health benefits and risks. *Sex Transm Infect*. 1998; 74: 368-373.
4. Van Ryzin L. The circumcision debate. *Am J Nurs*. 2000; 100: 24A-24B.
5. Darby R. The masturbation taboo and the rise of routine male circumcision: A review of the historiography. *J Soc Hist*. 2003; 36: 737-759.
6. Fleiss PM, Hodges FM, Van Howe RS. Immunological functions of the human prepuce. *Sex Transm Infect*. 1998; 74: 364-367.
7. Hodges F. A short history of the institutionalization of involuntary sexual mutilation in the United States. In Denniston GC, Milos MF, eds. *Sexual mutilations: a human tragedy*. New York: Plenum, 1997; 17-40.
8. Laumann EO, Masi CM, Zuckerman EW. Circumcision in the United States. *JAMA*. 1997; 277: 1052-1057.
9. Percent of newborn males with circumcision performed in short-stay hospitals by race: United States, 1999. Available at: <http://www.cdc.gov/nchs>. Accessed March 28, 2004.
10. Percent of newborn males with circumcision performed in short-stay hospitals by region: United States, 1999. Available at: <http://www.cdc.gov/nchs>. Accessed March 28, 2004.
11. Wiswell TE, Hachey WE. Urinary tract infections and the uncircumcised state. *Clin Pediatr*. 1993; 32: 130-134.
12. Craig JC, Knight JF, Sureshkumar P, et al. Effect of circumcision on incidence of urinary tract infection in preschool boys. *J Pediatr*. 1996; 128: 23-27.
13. Spach DH, Stapleton AE, Stamm WE. Lack of circumcision increases the risk of urinary tract infection in young men. *JAMA*. 1992; 267: 679-681.
14. Schoen EJ. The status of circumcision of newborns. *N Engl J Med*. 1990; 322: 1308-1312.
15. Young JL, Percy CL, Asine AJ, et al. Surveillance, epidemiology, and end results, incidence and mortality data, 1973-77. *Natl Cancer Inst Monogr*. 1981; 57: 17.
16. Rangabashyam N, Gnanaprakasam D, Meyyappan P, et al. (1981). Carcinoma of the penis: a review of 214 cases. *J R Coll Surg Edinb*. 1981; 26: 104-109.
17. Villa LL, Lopes A. Human papillomavirus DNA sequences in penile carcinomas in Brazil. *Int J Cancer*. 1986; 37: 853-855.
18. Maden C, Sherman KJ, Beckmann AM, et al. History of circumcision, medical conditions, and sexual activity and risk of penile cancer. *J Natl Cancer Inst*. 1993; 85:



19-24.

19. Aynaoud O, Ionesco M, Barrasso R. Penile intraepithelial neoplasia: specific clinical features correlate with histologic and virologic findings. *Cancer*. 1994; 74: 1762-1767.

20. McCance DJ, Kalache A, Ashdown K, et al. Human papillomavirus types 16 and 18 in carcinomas of the penis from Brazil. *Int J Cancer*. 1986; 37: 55-59.

21. Shah KV. Human papillomaviruses and anogenital cancers. *N Engl J Med*. 1997; 337: 1386-1388.

22. Persky L, de Kernion J. Carcinoma of the penis. *CA Cancer J Clin*. 1986; 36: 258-273.

23. Lane T. Male circumcision reduces risk of both acquiring and transmitting human papillomavirus infection. *Int Fam Plan Perspect*. 2002; 28: 179-180.

24. Moses S, Plummer FA, Bradley JE, et al. The association between lack of male circumcision and risk for HIV infection: A review of the epidemiological data. *Sex Transm Dis*. 1994; 21: 201-210.

25. Kiwanuka N, Gray R, Sewankambo N, et al. Religion, behaviours, and circumcision as determinants of HIV dynamics in rural Uganda [abstract PubD1294]. In: Vol 2. XI International Conference on AIDS, Vancouver, Canada. 1996.

26. Kulkarni U, & Dattatray S. Circumstances in males and HIV transmission [abstract TuC2686]. In XI International Conference on AIDS. Vol 1. Vancouver, Canada. 1996.

27. Mbugua GG, Muthami LN, Mutura SA, et al. Epidemiology of HIV infection among long distance truck drivers in Kenya. *East Afr Med J*. 1995; 72: 515-518.

28. Mehendale SM, Shepherd ME, Divekar AD, et al. Evidence for high prevalence and rapid transmission of HIV among individuals attending STD clinics in Pune, India. *Indian J Med Res*. 1996; 104: 327-335.

29. Nasio JM, Nagelkerke NJD, Mwatha A, et al. Genital ulcer disease among STD clinic attenders in Nairobi: Association with HIV-1 and circumcision status. *Int J STD AIDS*. 1996; 7: 410-414.

30. Sassan-Morokro M, Greenberg AD,

Coulibaly IM, et al. High rates of sexual contact with female sex workers, sexually transmitted diseases, and condom neglect among HIV-infected and uninfected men with tuberculosis in Abidjan, Cote d'Ivoire. *J Acquir Immune Defic Syndr*, 11, 183-187.

31. Tyndall M, Ronald AR, Agoki E, et al. Increased risk for infection with the human immunodeficiency virus type-1 among uncircumcised men in Kenya. *Clin Infect Dis*. 1996; 23: 449-453.

32. Urassa M, Todd J, Boerma JT, et al. Male circumcision and susceptibility to HIV infection among men in Tanzania. *AIDS*. 1997; 11: 73-80.

33. Quigley M, Munguti K, Grosskurth H, et al. Sexual behaviour patterns and other risk factors for HIV infection in rural Tanzania. *AIDS*. 1997; 11: 237-248.

34. Grosskurth H, Mosha F, Todd J, et al. A community trial of the impact of improved sexually transmitted disease treatment on the HIV epidemic in rural Tanzania: 2 baseline survey results. *AIDS*. 1995; 9: 927-934.

35. Chao A, Bulterys M, Musanganire F, et al. Risk factors associated with prevalent HIV-1 infection among pregnant women in Rwanda. *Int J Epidemiol*. 1994; 23: 371-380.

36. Storms MR. AAFP fact sheet on neonatal circumcision: a need for updating. *Am Fam Physician*. 1996; 54: 1216-1218.

37. Marck J. Aspects of male circumcision in sub-equatorial African culture history. *Health Transit Rev*. 1997; 7: 337-359.

38. Sow PS, Diop BM, Barry HL, et al. Tetanus et pratiques traditionnelles a Dakar (a propos de 141 cas). *Dakar Med*. 1993; 38: 55-59.

39. Hardy DB. Cultural practices contributing to the transmission of human immunodeficiency virus in Africa. *Rev Infect Dis*. 1987; 9: 1109-1119.

40. Annobil SH, Al-Hilfi A, Kazi T. Primary tuberculosis of the penis in an infant. *Tubercle*. 1990; 71: 229-230.

41. Crowley IP, Kesner KM. Ritual circumcision (umkhwetha) among the Xhosa of the Ciskei. *Br J Urol*. 1990; 66: 318-321.

42. Cherpès TL, Meyn LA, Krohn MA, et al. Risk factors for infection with herpes

simplex virus type 2: role of smoking, douching, uncircumcised males, and vaginal flora. *Sex Transm Dis*. 2003; 30: 405-410.

43. Corey L, Wald A. Genital herpes. In: Holmes KK, Sparling PF, Mardh PA, eds. *Sex Transm Dis*. 3rd Ed. New York: McGraw Hill, 1999; 285-312.

44. Langenberg A, Corey L, Ashley R, et al. A prospective study of new infections with HSV-1 and HSV-2. *N Engl J Med*. 1999; 341: 1532-1538.

45. Parker SW, Stewart AJ, Wren MN, et al. Circumcision and sexually transmissible disease. *Med J Aust*. 1983; 2: 288-290.

46. Taylor PK, Rodin P. Herpes genitalis and circumcision. *Br J Vener Dis*. 1975; 51: 274-277.

47. Bassett I, Donovan B, Bodsworth NJ, et al. Herpes simplex virus type with infection of heterosexual men attending a sexual health centre. *Med J Aust*. 1994; 160: 697-700.

48. Cook LS, Koursky LA, Holmes KK. Circumcision and sexually transmitted diseases. *Am J Public Health*. 1994; 84: 197-201.

49. Donovan B, Bassett I, Bodsworth NJ. Male circumcision and common sexually transmissible diseases in a developed nation setting. *Genitourin Med*. 1997; 70: 317-320.

50. Hart G. Factors associated with genital chlamydial and gonococcal infection in males. *Genitourin Med*. 1993; 69: 393-396.

51. Hooper RR, Reynolds GH, Jones OG, et al. Cohort study of venereal disease. I: the risk of gonorrhoea transmission from infected women to men. *Am J Epidemiol*. 1978; 108: 136-144.

52. Wilson RA. Circumcision and venereal disease. *Can Med Assoc J*. 1947; 56: 54-56.

53. Smith GL, Greenup R, Takafuji E. Circumcision as a risk factor for urethritis in racial groups. *Am J Public Health*. 1987; 77: 452-454.

54. U.S. Bureau of the Census. Recent HIV seroprevalence levels by country: January 1998. Research Note No 24. 1998.

55. Newell J, Senkoro K, Mosha F, et al. A population-based study of syphilis and sexually transmitted disease syndromes in north-western Tanzania. 2: risk factors and



health seeking behaviour. *Genitourin Med.* 1993; 69: 421-426.

56. Cameron DW, Simonsen JN, D'Costa LJ, et al. Female to male transmission of human immunodeficiency virus type 1: risk factors for seroconversion in men. *Lancet.* 1989; ii: 403-407.

57. Hammond GW, Slutchuk M, Scatliff J, et al. Epidemiologic, clinical, laboratory, and therapeutic features of an urban outbreak of chancroid in North America. *Rev Infect Dis.* 1980; 2: 867-879.

58. Nsanze H, Fast MV, D'Costa LJ, et al. Genital ulcers in Kenya. *Br J Vener Dis.* 1981; 57: 378-381.

59. Piot P, Duncan M, VanDyck E, et al. Ulcerative balanoposthitis associated with non-syphilitic spirochaetal infection. *Genitourin Med.* 62, 44-46.

60. Simonsen JN, Cameron DW, Gakinya

MN, et al. Human immunodeficiency virus infection among men with sexually transmitted diseases. *N Engl J Med.* 1988; 319: 274-278.

61. Thirumoorthy T, Sng EH, Doraisingam S, et al. Purulent penile ulcers of patients in Singapore. *Genitourin Med.* 1986; 62: 253-255.

62. Diseker RA, Peterman TA, Kamb ML, et al. Circumcision and STD in the United States: cross sectional and cohort analyses. *Sex Transm Infect.* 2000; 76: 330-335.

63. Niku SD, Stock JA, Kaplan GW. Neonatal circumcision. *Urol Clin North Am.* 1995; 22: 57-65.

64. McDermott RJ, Wilson DD, Marty PJ. Neonatal circumcision. *Patient Couns Health Educ.* 1982; 3: 132-136.

65. Wiswell N, Kapila L. Complications of circumcision. *Br J Surg.* 1993; 80: 1231-1236.

66. Ozdemir E. Significantly increased complication risks with mass circumcision. *Br J Urol.* 1997; 80: 136-139.

67. Gluckman GR, Stroller ML, Jacobs MM, et al. Newborn penile glans amputation during circumcision and successful reattachment. *J Urol.* 1995; 153: 778-779.

68. Ozkan S, Gurpinar T. A serious circumcision complication: penile shaft amputation and a new reattachment technique with a successful outcome. *J Urol.* 1997; 158: 1946-1947.

69. Bean G, Egelhoff C. Neonatal circumcision: when is the decision made? *J Fam Pract.* 1984; 18: 883-887.

70. Binner SL, Mastrobattista JM, Day MC, et al. Effect of parental education on decision-making about neonatal circumcision. *South Med J.* 2002; 95:457-461.

HealthTeacher.com... It's All About Health.

HealthTeacher.com is an original curriculum created for teachers that

- **Is comprehensive and sequential.**
- **Covers nine core topic areas, including the top six risk factors identified by CDC.**
- **Meets National Health Education Standards. Compare HealthTeacher's curriculum alignment with the Assessment Framework Descriptors.**
- **Is based on the Assessment Framework.**

There are 278 lesson guides covering K-12 in five grade levels. Each lesson includes:

- **Skills-based student assessment.**
- **Transparency masters and student handouts**