

Male Circumcision in the United States for the Prevention of HIV Infection and Other Adverse Health Outcomes: Report from a CDC Consultation

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SYNOPSIS

In April 2007, the Centers for Disease Control and Prevention (CDC) held a two-day consultation with a broad spectrum of stakeholders to obtain input on the potential role of male circumcision (MC) in preventing transmission of human immunodeficiency virus (HIV) in the U.S. Working groups summarized data and discussed issues about the use of MC for prevention of HIV and other sexually transmitted infections among men who have sex with women, men who have sex with men (MSM), and newborn males. Consultants suggested that (1) sufficient evidence exists to propose that heterosexually active males be informed about the significant but partial efficacy of MC in reducing risk for HIV acquisition and be provided with affordable access to voluntary, high-quality surgical and risk-reduction counseling services; (2) information about the potential health benefits and risks of MC should be presented to parents considering infant circumcision, and financial barriers to accessing MC should be removed; and (3) insufficient data exist about the impact (if any) of MC on HIV acquisition by MSM, and additional research is warranted. If MC is recommended as a public health method, information will be required on its acceptability and uptake. Especially critical will be efforts to understand how to develop effective, culturally appropriate public health messages to mitigate increases in sexual risk behavior among men, both those already circumcised and those who may elect MC to reduce their risk of acquiring HIV.

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The recent demonstration of the efficacy of adult male circumcision (MC) in reducing the risk of female-to-male sexual transmission of human immunodeficiency virus (HIV) in Africa led to clear recommendations for its introduction in areas of the world with a high incidence of heterosexually transmitted HIV and a low prevalence of MC.¹ However, many questions remain unanswered about the role of MC in the United States and other settings where HIV incidence is relatively low, the majority of adult men are already circumcised, and male-male sex is the predominant mode of HIV transmission.²

To address these questions, the Centers for Disease Control and Prevention (CDC) convened a Consultation on Public Health Issues Regarding Male Circumcision in the United States for the Prevention of HIV Infection and Other Health Consequences on April 26–27, 2007, in Atlanta. Invited participants included epidemiologists; researchers; health economists; ethicists; physicians; and representatives of practitioner associations, community-based organizations, and groups objecting to elective circumcision. This article reports on the major themes raised during the consultation, the data reviewed during and after the consultation, and the next steps for CDC resulting from the discussions.

BACKGROUND

MC, the surgical removal of the foreskin of the penis, has been associated with lower risk for several adverse health conditions.³ Observational, cohort, and clinical studies have demonstrated a decreased risk for circumcised males (compared with uncircumcised peers) of urinary tract infection (UTI),⁴ syphilis and chancroid,⁵ cancer of the penis,^{6,7} balanoposthitis and other inflammatory dermatoses,⁸ and transmission of chlamydia to their female partners.⁹

Ecologic studies have demonstrated an association between low rates of MC and higher HIV prevalence in African and Asian populations, as have multiple cross-sectional, case-control, and prospective observational studies.^{10,11} An association between MC status and HIV infection has biologic plausibility: the inner foreskin presents less of a physical barrier to infection due to its decreased keratinization compared with the glans of the circumcised penis and the skin of the penile shaft,¹² leading to its greater susceptibility to epithelial disruption.^{13–15} The foreskin also has a greater concentration of HIV target cells, such as Langerhans cells and macrophages, than does other penile tissue.¹¹ In addition, the uncircumcised male penis has increased mucosal surface area that would be exposed to HIV-containing secretions during penetrative sex, and the

prepuce can trap secretions, resulting in prolonged contact with the mucosa.

Recently, three large, randomized clinical trials have demonstrated a 50% to 60% reduction in incident HIV infection among heterosexual adult men after circumcision as compared with control groups randomized to delayed circumcision.^{16–18} All three studies were halted by their data and safety monitoring boards when interim analyses demonstrated the protective effects of MC, and it was felt to be unethical to withhold circumcision from the control groups any longer. Together, these three trials provided strong evidence that MC can significantly reduce men's risk of acquiring HIV infection in the contexts in which the trials were conducted—i.e., settings of high HIV prevalence, low circumcision prevalence, and predominantly heterosexual HIV transmission dynamics. These data led the United Nations Joint Programme on HIV and Acquired Immunodeficiency Syndrome (AIDS) (UNAIDS) and the World Health Organization (WHO) to recommend that MC be recognized as an additional important intervention to reduce the risk of heterosexually acquired HIV infection in men in settings where there is high HIV incidence in heterosexual men with low circumcision rates.¹ It is less clear how such protection would affect transmission in the context of the U.S. epidemic, in which there is low HIV prevalence and already high prevalence of MC, and in which a predominant mode of transmission to men is through receptive anal intercourse rather than insertive penile-vaginal sex.

An analysis of data collected in an HIV-prevention trial in Uganda showed that among HIV-discordant couples in which the HIV-infected male had a viral load <50,000 copies/milliliter, MC was associated with a significant decreased transmission rate to uninfected spouses (0.0/47 person-years in couples with circumcised males vs. 9.6/100 person-years in couples with uncircumcised males).¹⁹ However, a clinical trial in Uganda to assess the impact of MC on male-to-female transmission reported that its first interim safety analysis showed a nonsignificantly higher rate of HIV acquisition in women partners of HIV-positive men in couples who had resumed sex prior to certified postsurgical wound healing, and did not detect a reduction in HIV acquisition by female partners engaging in sex after wound healing was complete.²⁰

FRAMING THE DISCUSSION

Overview of the U.S. HIV epidemic by route of transmission and demographic group

The U.S. had initial success in reducing the rate of new sexually acquired HIV infections through the

widespread provision of HIV education and risk-reduction counseling, increased condom availability, and the development of both anonymous and confidential HIV testing services.^{21,22} However, in 2006, approximately 56,300 new HIV infections occurred, of which 73% were among males, according to CDC estimates. By transmission risk category regardless of gender, 53% of new infections were among men who have sex with men (MSM), 31% were among heterosexuals with reported high risk of exposure, and 12% were among injection drug users (IDUs).²³ It is worth noting that a substantial proportion of the infections attributed to IDU risk in the hierarchical risk categorization used for surveillance purposes may have resulted from sexual exposure.²⁴ Of the estimated 54,230 new infections among white, black, and Hispanic people in 2006, the highest rates of new infections per 100,000 population occurred in black men (115.7) and women (55.7).²⁵ Among men, 72% of estimated infections were in MSM, while heterosexual transmission accounted for only 5% of infections. The potential impact of MC on the U.S. epidemic through prevention of heterosexual transmission to men is, therefore, currently limited. Because HIV prevalence rates are significantly higher among African American and Hispanic men and women compared with other racial/ethnic groups in the U.S., as is the proportion of male infections reported due to heterosexual transmission, the applicability and availability of new prevention technologies such as MC across racial/ethnic groups are critical considerations. And at the individual level, MC may play a role in preventing HIV among men who engage in unprotected heterosexual sex in communities where prevalence of HIV infection is high or with multiple serial or concurrent partners, either of which can result in an increased risk of HIV exposure.

Evidence of association between MC and HIV in MSM and heterosexual men in the U.S.

No researchers have conducted clinical trials of MC in the U.S., and very limited observational data exist on the association between MC status and HIV infection among MSM and heterosexual men. The HIV Network for Prevention Trials HIV-vaccine preparedness cohort study enrolled 3,257 MSM in six U.S. cities to prospectively evaluate sexual risk behavior and HIV incidence. The majority of participants (76%) were white, and 84% of all participants reported being circumcised. Uncircumcised men were twice as likely as circumcised men to acquire HIV infection (odds ratio [OR] = 2.0, 95% confidence interval [CI] 1.1, 3.7) after adjustment for sexual behaviors, age, and insurance status.²⁶ However, in another prospective

cohort study of MSM, no association was found between MC status and incident HIV infection.²⁷ In a recent cross-sectional study of African American and Latino MSM, MC was not associated with previously known or newly diagnosed HIV status.²⁸ In a cross-sectional study of heterosexual men attending a sexually transmitted disease (STD) clinic, among patient visits with known HIV exposure, MC was significantly associated with reduced HIV prevalence (10.2% vs. 22.0%, OR = 0.42, 95% CI 0.20, 0.92).²⁹

Overview of MC in the U.S.

Unlike the men enrolled in the African trial sites, most adult males in the U.S. have been circumcised in infancy. The National Health and Nutrition Examination Survey interviewed 6,174 men in its national probability samples recruited from 1999 to 2004 about their circumcision status and sexual behaviors. Eighty-eight percent of non-Hispanic white men, 73% of non-Hispanic black men, and 42% of Mexican American men were circumcised, and circumcision status was not related to their sexual behaviors.³⁰ However, hospital discharge data indicate recent declines in neonatal circumcision, with only 56% of newborn boys circumcised in 2003.³¹ Hospital discharge data may underestimate this proportion, as some infants are circumcised in the first year of life as outpatients after their birth hospitalization.³² These estimates are consistent with data from the Federal Healthcare Cost and Utilization Project showing that in 2000, 59% of all newborn males, and 86% of those without a diagnosis precluding surgery, were circumcised at birth.³³

Recent declines in neonatal MC may be related to changes in the policies of the American Academy of Pediatrics (AAP). In 1999 (reaffirmed in 2005), AAP modified its previous neutral statement that “circumcision has potential medical benefits and advantages as well as disadvantages and risks” to one that may have been perceived as less supportive of the practice: “[data demonstrate] potential medical benefits . . . however, these data are not sufficient to recommend routine neonatal circumcision.”³⁴ In the wake of this change, 16 states enacted legislation to remove Medicaid coverage for the procedure, as it was deemed at the time “not medically necessary.”³⁵ Other professional associations followed the AAP’s lead.^{36–38} Many private insurers followed suit as well, leading to significant financial barriers for elective neonatal circumcision.³⁹ A survey in 1995 found that 61% of neonatal circumcisions were financed by private insurers, 36% by Medicaid programs, and 3% by self-payment. Compared with infants of self-pay parents, those with private insurance were 2.5 times more likely to be circumcised.⁴⁰

Evidence about potential adverse outcomes of MC in the U.S.

Medical outcomes. Adult/adolescent circumcisions in the U.S. are performed primarily for genital pathology, most commonly phimosis or paraphimosis. Consequently, there are no generalizable safety data for elective circumcision in this population. The safety of elective adult MC documented in the three African trials is reassuring in this regard, with rates of severe adverse events attributable to the surgery of 0.0% to 1.7% of circumcisions in HIV-negative men.¹⁶⁻¹⁸

Neonatal circumcision in the U.S. is a safe procedure; however, it is not without risk. In a study of 130,475 newborns identified in the Washington State Comprehensive Hospital Abstract Reporting System (1987-1996) as circumcised during their birth hospital stay, 0.18% had a bleeding complication, 0.04% had a complication coded as "injury," and 0.0006% had penile cellulitis diagnosed before discharge.⁴¹ In a trade-off analysis based on observed complication rates and published studies of the effect of circumcision on rates of UTIs in the first year of life and lifetime risk of penile cancer, the investigators calculated that a complication might be expected in one out of every 476 circumcisions, that six UTIs can be prevented for every complication endured, and nearly two complications would be expected for every case of penile cancer prevented.

An analysis was conducted of 136,086 boys born in U.S. Army hospitals from 1980 to 1985 with a medical record review for indexed complications related to circumcision status during the first month of life.⁴² For 100,157 circumcised boys, 193 (0.19%) complications occurred. The frequencies of UTI ($p < 0.0001$) and bacteremia ($p < 0.0002$) were significantly higher in the uncircumcised boys than among those circumcised. In neither study were any circumcision-related deaths or losses of the glans or entire penis reported.

A recent case-control study of two outbreaks of methicillin-resistant *Staphylococcus aureus* (MRSA) in otherwise healthy male infants at one hospital identified circumcision as a potential risk factor. However, these MRSA infections did not involve the excision site, lidocaine injection site, or the penis, and none of the environmental samples (including circumcision equipment and open lidocaine vials) tested positive for MRSA.⁴³

Higher rates of both physical and sexual adverse outcomes have been attributed to neonatal MC in cited publications. However, estimation of the frequency of adverse outcomes of neonatal MC for the general population of healthy newborn males is limited from studies with small or single-site nonrepresentative patient

populations,⁴⁴ in case series without a control group,⁴⁵ in studies without assessment of likely confounders,⁴⁶ in data collections with inherently biased samples,^{47,48} in studies where problematic analytic strategies were used (e.g., reporting "prospective" findings from a cross-sectional data collection),^{44,45} or in the absence of primary source data.⁴⁹

Sensory and sexual-functioning outcomes. Studies of sexual sensation and function in relation to MC are few, and the few results that are available present a mixed picture.^{47,48,50-52} Taken as a whole, the studies suggest that some decrease in sensitivity of the glans can occur following circumcision and that there may be a consequent increase in ejaculatory latency. However, several studies conducted in men undergoing adult circumcision found that few men felt that their sexual functioning was worse after circumcision, with most reporting either improvement or no change.⁵³⁻⁵⁶ Similarly, the three African trials found high levels of satisfaction among the men after circumcision. Many of these studies were conducted in African, European, and Asian populations, however, so cultural differences limit extrapolation of their findings to U.S. men.⁵⁷

Sexual risk compensation

Concerns about whether increased risk behaviors will be associated with the introduction of partially effective interventions are often raised as a potential limitation of innovations in HIV prevention.^{58,59} Based on theories of risk homeostasis, risk compensation in HIV-prevention research is defined as partially offsetting the adoption of risk-reduction strategies by compensatory behaviors that may increase the risk of HIV acquisition (e.g., number of partners or frequency of sex without condoms).

Risk compensation has been monitored in HIV cohort preparedness studies and a variety of intervention trials that did not involve MC. However, behavior of trial participants who are unsure of the efficacy of the intervention under study and who are receiving intensive counseling may not be reflective of what will occur in people receiving an intervention known to have high but partial efficacy and who receive infrequent counseling. One study that followed participants after the trial ended did not see a later return to high rates of risk behavior in commercial sex workers.⁶⁰

In the three African MC trials, participants were aware of their circumcision status, and some risk compensation over the long term was observed in two of the trials. In the Kenya trial,¹⁷ circumcised men reported more risky behavior at 24 months, and in South Africa,¹⁶ circumcised men had more sexual contacts than uncircumcised men from month four

through month 21 of follow-up. In the Uganda trial,¹⁸ at 24 months no risk behavior differences were observed between study arms. However, even where behavioral differences were reported, substantial efficacy for MC was observed.

Potential impact and cost-effectiveness of MC in the U.S.

While several cost and cost-effectiveness studies of neonatal MC for the prevention of adverse health outcomes (e.g., UTIs, penile cancer, and STDs) have been published in the past,⁶¹ they are subject to a variety of methodologic limitations and data insufficiencies. All of these studies were conducted prior to the recent availability of clinical trial data on the efficacy of MC against heterosexual HIV transmission.

A new set of cost-effectiveness analyses being developed at CDC were presented at the consultation. These analyses are modeling the potential impact on the U.S. epidemic for (1) adult circumcision among MSM in a large, urban city and (2) neonatal circumcision for reduction in lifetime risk of HIV infection. The group presented the parameters and assumptions of the models for discussion. Specifically for MSM, the group suggested that additional factors be modeled, including a range of potential increases (as well as decreases) in condom use, possible decreases in per-act efficacy over time, a wider range of costs/charges to account for MC in varied local and clinical settings, and cost-effectiveness comparisons to other HIV-prevention modalities.

Ethical and cultural considerations

While the consultation group found a few published discussions of the ethics of MC trials,⁶² neonatal circumcision,⁶³ and implementation of adult MC in developing countries,⁶⁴ there was no published literature about the ethical issues involved in implementation of adult MC in the U.S. for HIV prevention. Because it is important to consider the ways in which societies, groups, and individuals may weigh the benefits and risks of MC differently and the degree to which the interpretation of data is contested,⁶¹ a U.S. ethicist presented a variety of ethical considerations both from the viewpoint of medical ethics and social issues.

In communicating about the risks and benefits from a new intervention, it was noted that anecdote, rumor, and misinformation can have greater impact than scientifically warranted. The weight ascribed to a rare but dramatic complication (e.g., complication leading to penile disfigurement) can have enormous impact. However, even with data-based assessments, there are

disagreements about which risk/benefit endpoints to include in the balance and how heavily to weight them. It is also necessary to consider whether the benefits (reduced HIV transmission) expected from a new intervention can realistically be achieved by alternative methods, each of which has its own perceived risks and benefits.

The role of informed and voluntary consent for MC involves a thin line between persuasion, peer pressure, and the potential for undue influence. And for children, there are competing rights: (1) the right of parents to make decisions for their children, (2) the right of children to be protected from serious harms, and (3) the right of children to choose different values from their parents.

When choosing whether to recommend targeted or universal approaches to MC, issues of justice arise. Will a recommendation targeted to a high-risk subgroup result in stigmatization? If an intervention is recommended for all people in a group, regardless of their individual risk, we will be asking those at low risk to accept the risks of the intervention primarily for the benefit of others (those at high risk) who already have safe and effective alternatives available to them (e.g., condoms).

An additional ethical concern presented was how MC for the prevention of HIV infection will be incorporated into the ethical conduct of HIV-prevention trials. It was suggested that, at a minimum, MC should be measured as a covariate to be accounted for, and information about MC should be provided to trial participants. Trialists may need to reduce barriers to local access if quality services are available. Also, offering MC to trial participants as part of the prevention package may be the ethical thing to do, even though it may make prevention trials more complex, costly, and time-consuming (e.g., it may affect recruitment, sample size, and staffing requirements).

The most important principle in ethical clinical and public health decision-making about MC will be to clarify what is known, what is not known, and where there is uncertainty. Discrepancies in hard data should be acknowledged, particularly when policy is being based on nonempirical considerations. And whenever possible, we should offer reasons for policies that are understandable to people of different cultural and religious beliefs.

WORKING GROUP PROPOSALS

Consultants divided into three working groups focused on circumcision issues for the following three groups:

(1) MSM, (2) men who have sex with women (MSW), and (3) newborns. Each group was asked to respond to four questions:

- Considering the information presented, what are the key issues for MC in this population?
- What additional data should be collected and by whom?
- What policy and program guidance should be developed and by whom?
- What other activities should be conducted and by whom?

At the end of the discussion period, each group was asked to summarize their responses to these questions for presentation and discussion by the entire consultation group. The Figure summarizes the proposals made to CDC by the three working groups of external consultants. All groups offered support for CDC to consider the following:

- Developing information resources to guide adult/adolescent men, parents, medical practitioners, public health programs, and communities about the potential benefits and risks of MC for the promotion of male sexual health. These resources should be evidence based and clearly indicate what benefits and risks have been demonstrated and their magnitude, and which are theoretical but still unproven.
- Ensuring that financial barriers to elective MC are removed for men who engage in unprotected penile-vaginal sex (whether or not they also engage in anal and/or oral sex) and are at risk for HIV, and for newborns when their parents decide MC is in their best interest.
- Developing messages for the majority of already circumcised men to reinforce the partial efficacy of MC for HIV prevention in penile-vaginal sex and the need for continued use of other effective HIV-prevention modalities (e.g., partner reduction and consistent condom use).
- Collecting additional data in many areas, including observational studies, operational research, demonstration projects and evaluation studies, and potential efficacy trials for MSM. Also, adding one or more MC variables to a variety of planned or ongoing studies dealing with STD/HIV-related outcomes is indicated.

Additional themes included interest in the effect of MC on genital ulcer disease, which is a risk factor for HIV acquisition, and a concern that due attention be given to appropriate messages and approaches for

diverse elements in the U.S. population at risk for HIV infection (e.g., age, race/ethnicity, and sexual practices).

Issues for MSM

The consultants emphasized the need to make a distinction in prevention messages and the research agenda between insertive vaginal and insertive anal sex. It is unclear whether the proposed mechanism of action (i.e., removal of skin with high concentration of Langerhans that serve as targets for HIV entry) applies in both situations. While MSM who engage in unprotected anal intercourse represent the majority of new HIV infections among men in the U.S., the risk to the receptive partner is significantly higher than to the insertive partner. Because the recent trials of MC provided no evidence that MC protects against HIV acquisition during anal or oral intercourse, there was not general support for providing MC as an HIV-prevention strategy among MSM who do not also engage in penile-vaginal intercourse that places them at risk for HIV. However, as the majority of new infections in the U.S. are attributable to anal intercourse, additional research is needed to define the safety and any potential effectiveness of MC in this population.

Issues for MSW

Many in this working group felt that the efficacy found in the African trials could be extrapolated to heterosexual sex in the U.S. Important issues presented included (1) recognition that some men have sex with both women and men and will need messages targeted to them about what risk reduction might/might not be provided by MC, (2) the desire to frame the messages about MC in the context of penile hygiene and prevention of STDs as well as HIV without suggesting that uncircumcised penises are unhygienic, and (3) the need for trial results of MC in HIV-positive men and possible risks/benefits to female partners (e.g., effect on risk of male-to-female HIV transmission). The consultants further suggested that gathering acceptability data from women and potential MC candidates were important additional steps to be taken.

Issues for newborns

Consultants in this group stressed the importance of providing evidence-based risk and benefit information to physicians and parents, allowing for a fully informed decision about neonatal circumcision; removing financial barriers to accessing MC for all populations; and carefully monitoring the safety of the procedure by differing methods and providers. It was also suggested

Figure. Working group proposals, CDC Consultation on Public Health Issues Regarding Male Circumcision in the United States for the Prevention of HIV Infection and Other Health Consequences, April 2007

Cross-group proposals

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- P1 With respect to HIV prevention, MC should be framed as one of several partially effective risk-reduction alternatives for heterosexual men that should be used in combination for maximal protection.
 - P2 Recommendations for infant and adolescent/adult MC should be framed as interventions to promote genital health and hygiene, including HIV, STI, and UTI prevention and other outcomes.
 - P3 Consider the messaging, timing, availability, reimbursement, and consent issues of MC for uncircumcised younger adolescents before they become sexually active.
 - P4 Recommend reimbursement for MC by public and private insurers to ensure equal access across states, to all socioeconomic groups, and in special settings (e.g., military or prisons).
 - P5 Recommendations for MC should not be restricted to any racial/ethnic/socioeconomic group.
 - R1 In collaboration with other HHS agencies and health insurers, monitor the impact of programs and policies, access, and reimbursement, including who, what, where, when, how, and medical and behavioral outcomes of MC procedures.
 - R2 Consult additional stakeholders (community organizations, national advocacy organizations, professional associations, women's groups, and AIDS service organizations) about the content and framing of MC recommendations.
 - R3 Assess the impact of adult/adolescent MC on the ethics, design, and cost of current and future HIV prevention trials.
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Proposals for men who have sex with women

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- P1 Working with professional associations, HRSA, and a variety of community stakeholders, provide program guidance for the introduction of MC as an additional HIV/STI prevention tool for men who have sex with women, along with other prevention strategies such as risk-reduction counseling, condoms, and HIV testing.
 - P2 Develop clear messaging about partial protection for HIV-negative men engaged in penile-vaginal sex and the lack of sufficient evidence for protection during other sexual behaviors.
 - P3 Develop tailored messages for men who are already circumcised, those who elect MC as adults/adolescents for HIV risk reduction, racial/ethnic and immigrant subpopulations, HIV-positive men, and men who have sex with both men and women.
 - R1 There is no need for, or equipoise to conduct, a U.S. trial for MC for HIV prevention among men who have sex with women.
 - R2 CDC, working with state and local health departments, professional provider groups, and community stakeholders, should establish demonstration projects to introduce adult/adolescent MC in high-incidence U.S. populations of men who engage in penile-vaginal sex. Data should be collected in the projects on implementation issues including messaging, acceptability, uptake, safety, cost, sexual behavior, and impact on HIV incidence.
 - R3 Collect data on the impact of MC in HIV-infected men on HIV incidence in their female partners. A separate consultation is recommended to develop appropriate trial designs given the HIV transmission risk identified in the Uganda trial.
 - R4 Collect data on sexual risk behavior and incident chlamydia and gonorrhea infection following adult MC. A separate consultation is recommended to develop appropriate study designs.
 - R5 Research and surveillance investigators should collect additional MC data through existing database collections and ongoing large trials/studies.
 - R6 Conduct studies on the validity of self-reported and partner-reported MC status.
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Proposals for MSM

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- P1 There is not enough evidence at this time to make a recommendation to encourage MC for MSM to prevent HIV infection.
 - P2 CDC fact sheets and any other guidance documents should explicitly state what is known and what is not known, provide information about HIV transmission risk during the healing period, and target information to both MSM and those who have sex with both men and women.
 - R1 There may be equipoise to conduct an efficacy trial of MC for the prevention of HIV transmission among MSM. If conducted, the trial should include both U.S. and international sites.
 - R2 A separate consultation should be held to design formative studies relevant to MC among MSM, including examination of existing data, identification of key outstanding questions, and study of specific sexual practices (e.g., sexual positioning), as well as methods to increase the racial/ethnic/socioeconomic/age diversity of MSM participating in MC-related studies.
 - R3 Check existing datasets and consider case-control and other analyses to answer some MC-related questions for MSM (e.g., rates of condom use/failures by MC status).
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Figure (continued). Working group proposals, CDC Consultation on Public Health Issues Regarding Male Circumcision in the United States for the Prevention of HIV Infection and Other Health Consequences, April 2007

Proposals for newborns

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| P1 | Medical benefits outweigh risks for infant MC, and there are many practical advantages of doing it in the newborn period. Benefits and risks should be explained to parents to facilitate shared decision-making in the newborn period. |
| P2 | CDC, AAP, and others should make/update recommendations about infant circumcisions for HIV and broader health concerns. |
| P3 | Develop educational resources about infant circumcision for parents, practitioners, and the public. |
| R1 | In collaboration with other HHS agencies and health insurers, assess public and private insurance coverage for elective neonatal MC. |
| R2 | Assess community perceptions about infant circumcision for prevention of HIV/STI/UTI and other health outcomes. |

CDC = Centers for Disease Control and Prevention

HIV = human immunodeficiency virus

P = program guidance

MC = male circumcision

STI = sexually transmitted infection

UTI = urinary tract infection

R = research and data collection

HHS = Department of Health and Human Services

AIDS = acquired immunodeficiency syndrome

HRSA = Health Resource and Services Administration

MSM = men who have sex with men

AAP = American Academy of Pediatrics

that several federal agencies (CDC, the Agency for Healthcare Research and Quality, and the Centers for Medicare and Medicaid Services) and organizations (e.g., the American College of Obstetricians and Gynecologists, AAP, and the American Urological Association) consider reviewing their policies on neonatal circumcision (and adult MC where indicated).

NEXT STEPS

CDC is committed to expanding the number of effective prevention modalities available to reduce the number of new HIV infections in the U.S. and improve other sexual health outcomes, and to promoting access to and uptake of these prevention modalities, especially in high-incidence populations. Consideration of the proposals made by the external consultants is ongoing at CDC. In follow-up to the consultation and activities suggested by the working groups, CDC is undertaking a variety of activities:

- In collaboration with other Department of Health and Human Services agencies and a variety of professional and community organizations, CDC is developing public health recommendations and communications messages for providers and patients that focus on the role of MC in reducing HIV transmission in MSW in the context of promoting men's sexual health.

- Through its established partnerships with funded community-based organizations, non-governmental organizations, state and local health departments, and other interested groups, CDC will continue a process of consultation to develop and disseminate guidance and materials to facilitate appropriate public health actions with respect to MC for the prevention of HIV acquisition. Potential activities under consideration, based on discussion at the April 2007 consultation, include referral of uncircumcised men who engage in unprotected penile-vaginal sex and have behavioral risk for HIV acquisition (e.g., multiple partners and prior STDs) to comprehensive HIV-prevention services, as well as education about and access to voluntary MC, HIV testing, risk-reduction counseling, and STD diagnosis and treatment.
- CDC will conduct additional data collection and surveillance efforts to monitor acceptability, uptake, cost, and health impacts of voluntary adult MC.
- CDC will continue to assist in the dissemination of new information about issues related to the role of adult and/or newborn circumcision in promoting public health as it becomes available.²

The findings and conclusions in this article are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention (CDC).

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