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## The Medical Benefits of Male Circumcision

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WITH 2 NEW STATES RECENTLY JOINING 16 OTHERS in eliminating Medicaid insurance for male circumcision, possible ballot initiatives to ban male circumcision, and the long-awaited American Academy of Pediatrics male circumcision policy statement, there is a need to evaluate the medical risks and benefits of male circumcision, particularly in light of recent medical evidence.

Three randomized trials in Africa demonstrated that adult male circumcision decreases human immunodeficiency virus (HIV) acquisition in men by 51% to 60%,<sup>1</sup> and the long-term follow-up of these study participants has shown that the protective efficacy of male circumcision increases with time from surgery. These findings are consistent with a large number of observational studies in Africa and in the United States that found male circumcision reduces the risk of HIV infection in men.<sup>1</sup> Thus, there is substantial evidence that removal of the foreskin reduces the risk of male heterosexual HIV acquisition. However, the effect of male circumcision on reducing HIV acquisition among men who have sex with men is unclear. There may be protection against insertional but not against receptive anal intercourse, so men practicing both forms of sexual intercourse may have limited protection associated with male circumcision.

In addition to HIV, male circumcision has been shown to reduce the risk of other heterosexually acquired sexually transmitted infections (STIs). Two trials demonstrated that male circumcision reduces the risk of acquiring genital herpes by 28% to 34%, and the risk of developing genital ulceration by 47%.<sup>1</sup> Additionally, the trials found that male circumcision reduces the risk of oncogenic high-risk human papillomavirus (HR-HPV) by 32% to 35%.<sup>1</sup> While some consider male circumcision to be primarily a male issue, one trial also reported derivative benefits for female partners of circumcised men; the risk of HR-HPV for female partners was reduced by 28%, the risk of bacterial vaginosis was reduced by 40%, and the risk of trichomoniasis was reduced by 48%.<sup>1,2</sup> It should be noted that no large-scale randomized controlled trial has assessed the benefit of neonatal male circumcision throughout several decades, which is when many of the potential health benefits would be realized. Such a trial is probably not feasible. However, observational data of men predominantly circumcised during childhood support the findings of the 3 randomized trials conducted in Africa<sup>1</sup> and the long-term medical benefits of male circumcision.

One concern is that the trials of male circumcision conducted in Africa may not be applicable to the United States. Despite 3 decades of safe-sex education in the United States,

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STIs continue to cause substantial morbidity and mortality. It is estimated that more than 1 million people are living with HIV/AIDS, and more than 50 000 new infections occur annually. Additional estimates suggest that there are 3 million to 5 million annual cases of trichomoniasis in the United States, and the prevalence of bacterial vaginosis among women of reproductive age is approximately 30%. One of the most common STIs is HPV, which causes genital warts, and penile and cervical cancer. Observational studies in the United States show that male circumcision is associated with reduced risk of men acquiring heterosexual HIV and HR-HPV infection.<sup>1,3</sup> Thus, STIs are a persistent problem in the United States, and male circumcision may provide individual and societal benefits.

The incidence of viral STIs in the United States is disproportionately higher among disadvantaged minority populations such as blacks and Hispanics, who have the lowest rates of male circumcision. For example, in Washington, DC, 7.1% of black males are living with HIV, and heterosexual exposure is the leading mode of transmission among these individuals.<sup>4</sup> Medicaid, which disproportionately provides health insurance for black children, is decreasing coverage for male circumcision, making the procedure less accessible, especially for those at the highest risk for these infections.<sup>5</sup> In contrast, Medicaid covers immunization against hepatitis B virus during the neonatal period even though it is difficult to predict who will be at high risk of STIs.

Using mathematical models and cost-effectiveness analyses, the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organization adopted a policy advocating male circumcision in countries and regions with heterosexual HIV epidemics. In a cost-effectiveness analysis by the Centers for Disease Control and Prevention, neonatal male circumcision in the United States was projected to increase quality-adjusted life-years and estimated to be cost-saving due to reduced HIV infections and subsequent treatment costs.<sup>6</sup> If protection from genital herpes, bacterial vaginosis, trichomoniasis, and penile and cervical cancer were considered in the analyses, the economic benefits most likely would be enhanced.

Opponents of male circumcision argue that the procedure constitutes genital mutilation performed with parental consent but not the infant's assent and recommend that male circumcision be delayed until 18 years of age when the man can provide individual informed consent to the procedure. However, parents provide consent for preventive procedures such as immunization including hepatitis B vaccination, acting in the best interests of their children. UNAIDS recommends providing information on risks and benefits of early infant neonatal male circumcision so parents and guardians can make informed decisions on behalf of their children with the best interests of the child as the primary consideration.<sup>7</sup> Additionally, a ban on neonatal male circumcision denies religious freedoms to Jewish and Muslim parents, which would be potentially unconstitutional.

Neonatal male circumcision provides other potential benefits during childhood such as prevention of infant urinary tract infections, meatitis, balanitis, and phimosis,<sup>8</sup> as well as protection from viral STIs. Approximately 50% of high school students report having sex prior to 18 years of age, so delaying male circumcision to age 18 years or older would deny children and adolescents these potential benefits. Neonatal male circumcision is a simple procedure and the complication rate is only between 0.2% and 0.6%<sup>8</sup>; the vast majority of complications are minor and easily treated. The complication rate of neonatal male circumcision is substantially lower than the complication rates of adult male circumcision (1.5%-3.8% during the trials), so delaying the procedure would only add to surgical risk.

Some who oppose male circumcision cite anecdotal reports that male circumcision can cause sexual dysfunction. The male circumcision trials evaluated sexual satisfaction in adult

men and their female partners before and after the procedure and compared men randomized to male circumcision with uncircumcised controls. There were no significant differences in male sexual satisfaction or dysfunction among trial participants, and in one trial, circumcised men reported increased penile sensitivity and enhanced ease of reaching orgasm.<sup>9</sup> In addition, 97% of female partners reported either no change or improved sexual satisfaction after their male partner was circumcised.<sup>10</sup>

The evidence for the long-term public health benefits of male circumcision has increased substantially during the past 5 years. If a vaccine were available that reduced HIV risk by 60%, genital herpes risk by 30%, and HR-HPV risk by 35%, the medical community would rally behind the immunization and it would be promoted as a game-changing public health intervention. Based on the medical evidence, banning infant male circumcision would deprive parents of the right to act on behalf of their children's health. Parents should be provided with information derived from evidence-based medicine about the risks and benefits of male circumcision so that they can make an informed choice for their children. It would be ethically questionable to deprive them of this choice. Medicaid and other insurance carriers should cover male circumcision costs if parents opt for the procedure, and the medical community, including the American Academy of Pediatrics and the Centers for Disease Control and Prevention, should recognize the health benefits of male circumcision in order to properly inform parents and physicians.

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