

Is neonatal circumcision clinically beneficial? Argument in favor

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The practice of circumcision has been recorded throughout history, and may be the oldest planned surgical procedure in civilization, dating back to 2200 BC. Despite the historical significance of circumcision, the procedure has been a perpetual source of controversy. Today there are many influences that shape people's decision to opt for circumcision. In the US, there is a desire to conform to what most of the population already do. Additionally, cultural influences and religious preferences can dictate the practice of circumcision. Physicians, however, may deny circumcision to people who seek this procedure. Given these divisive viewpoints, should circumcision be banned, or should the procedure be allowed when requested?

To answer these questions, we should assess the risk-benefit analysis of the procedure. An abundance of data and emerging evidence supports the public health benefits associated with circumcision. These benefits include reduced risks of genital cancer, urinary tract infection (UTI) and sexually transmitted infections in men and their female partners. Other issues, such as sexual function and adverse events, can also be considered.

Several studies have reported that uncircumcised men have a substantially increased risk of penile cancer, for which phimosis is the most significant risk factor. The incidence of invasive penile cancer in uncircumcised men is approximately 22 times higher than in circumcised men.^{1,2} Additionally, there seems to be a reduced risk of cervical cancer in women when their male partners are circumcised. Having pooled data from several case-control studies in five countries and three continents, Castellsagué *et al.*³ reported a reduced risk of human papillomavirus infection and cervical cancer in the female partners of circumcised men. This reduced risk of cervical cancer in monogamous women, however, was only significant in circumcised male partners with "high risk" sexual behavior, defined as six or more previous sexual partners (odds ratio 0.42, 95% CI 0.23–0.79).

Analyses of infant cohorts have indicated that periurethral colonization of bacteria is more prevalent in uncircumcised males compared with circumcised males.^{4,5} Furthermore, the incidence of UTI is significantly increased in uncircumcised males, which translates to a 4–12% increased risk of UTI in the first year of life.^{6,7} Thus, male circumcision in infants is considered to provide a medical benefit with regard to UTI during the first 3–6 months of life.^{6,8}

Several observational studies and meta-analyses have indicated a protective role of circumcision against sexually transmitted infections.^{3,9} These observational studies, however, are limited by selection biases. In order to provide convincing evidence to support circumcision, or any therapeutic intervention, randomized controlled trials (RCTs) are essential.

Over the past couple of years, three RCTs have been published that have generated a substantial amount of media attention with regard to the possible public health benefits of circumcision in sub-Saharan Africa.^{10–12} In 2005, Auvert *et al.*¹⁰ examined a group of men from semi-urban Orange Farm, South Africa, while two other RCTs assessed men in urban Kenya¹¹ and rural Uganda.¹² In these studies, nearly 11,000 HIV-negative adult men were randomized to either circumcision or observation, and then tested for HIV over 3-month and 6-month intervals. All studies were stopped early (after 2 years), as interim analyses showed a significant protective effect of circumcision against HIV infection. Notably, there was tremendous retention of the initial patient cohorts throughout the three RCTs, with 86–92% of the patients continuing follow-up. A striking observation from the results of these RCTs was that the risk ratios were similar for all three studies, showing a 60% protective effect of circumcision in the prevention of HIV in these populations.

Other contentious issues that surround circumcision are its effects on penile sensation and sexual satisfaction. Some reports show reduced sensation of the penis after circumcision, while

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Table 1 Summary of EBM levels of evidence supporting neonatal circumcision.**Competing interests**

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Clinical benefit/feature	Level of EBM
Decreased risk of urological cancer in males and female partners	Level 2 evidence
Decreased risk of STI	Level 1 evidence
Decreased risk of UTI	Level 2 evidence
Analgesics significantly reduce the pain of the procedure	Level 1 evidence
No impact on sexual function and satisfaction	Level 2 evidence

Abbreviations: EBM, evidence-based medicine; STI, sexually transmitted infection; UTI, urinary tract infection.

other studies report no difference at all. One of the major limitations of studies that report on the sensitivity of the penis is the lack of direct comparison and objectivity among the circumcised and uncircumcised men. In the first study that prospectively analyzed the effects of circumcision on sexual satisfaction and function, Kigozi and colleagues¹³ assessed 4,456 men from the Ugandan RCT. These men were given questionnaires, derived from the International Index of Erectile Function, at 6, 12 and 24 months. The researchers found that over 98% reported sexual satisfaction and normal sexual function, regardless of circumcision status.¹³

Further studies have shown that neonatal circumcision is painful, as measured by raised heart rate, blood pressure and serum cortisol levels, and reduced oxygen saturation. However, various methods of analgesia during neonatal circumcision have shown significant pain reduction, the most effective being dorsal penile block and ring block. The use of analgesia during circumcision, therefore, is now the standard of care.¹⁴

So, to circumcise or not to circumcise? Three RCTs have provided us with strong evidence that supports an association between circumcision and HIV prevention.¹⁰⁻¹² Consequently, the WHO and the UN have recommended that circumcision be a component of HIV prevention programs. Perhaps in the future this could be a public health benefit that can be transferred to the US and other industrialized countries. The American Academy of Pediatrics states that neonatal circumcision has potential medical benefits and advantages, as well as disadvantages and risks.¹⁵ Either way, it is essential that options are given to patients' families, and that informed consent is obtained. Level 1 and level 2 evidence-based medicine supports the public health benefits of circumcision, without any impact on sexual function (Table 1). Additionally, the adverse events associated with neonatal circumcision

are minimal, and current literature supports choice for parents and families. Elimination of choice would, therefore, oppress the right of patients' families to choose circumcision.

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