



Circumcision in baby boys (Beyond the Basics)

CIRCUMCISION OVERVIEW

Circumcision in the male is the removal of the foreskin of the penis. The practice of circumcision dates to ancient times. In ancient Egypt, prior to biblical times, circumcision was performed to improve male hygiene. Later, routine circumcision of male infants was part of the Abrahamic covenants with Jehovah, giving rise to religious circumcisions that continue to this day in the Jewish and Muslim faiths.

Circumcision rates in the United States vary according to geographic area, socioeconomic status, religious affiliation, insurance coverage, hospital type, and racial and ethnic group. The incidence in 2008 was about 55 to 57 percent based on hospital coding data, but this is probably an underestimate of the true incidence of circumcised males, which is likely closer to 80 percent, due to miscoding and because some circumcisions are performed after hospital discharge or later in life for religious, medical, or personal reasons [1]. Based on coding data, circumcision rates are highest in the Midwestern states (74 percent), followed by the Northeastern states (67 percent) and Southern states (61 percent), and are lowest in the Western states (30 percent).

There are no studies that give reliable data about the number of males who are circumcised after birth for elective or surgical indications. An Australian survey found that approximately 18 percent of males who were not circumcised as infants reported that they were circumcised subsequently [2,3].

NORMAL PENILE DEVELOPMENT AND HYGIENE

At birth, the foreskin, sometimes called the prepuce, is attached to the end of the penis, an area known as the glans (picture 1). Over time, the foreskin separates from the glans, forming a space between the skin and the glans. Separation is completed in 50 percent of boys by age 3 years, 95 percent by age 5 years, and 99 percent by adolescence. In a small number of uncircumcised males, partial adhesions leading to accumulation of smegma may persist throughout childhood, and even into adolescence.

Care of an uncircumcised penis — The foreskin should never be forcibly pulled back when there is resistance. Forcibly retracting the foreskin while it is still attached to the glans could cause injury.

The uncircumcised penis is generally easy to keep clean. Parents of an infant should gently wash the genital area while bathing. Later, when the foreskin is fully retractable, boys should be taught the importance of washing beneath the foreskin on a regular basis. The foreskin should be dried before pulling it forward.

BENEFITS OF CIRCUMCISION

There are several medical benefits to male circumcision. However, factors other than circumcision (eg, number of sexual partners, use of condoms, human papillomavirus (HPV) immunization, penile hygiene) are probably much more important risk factors for penile medical disorders than not being circumcised.

Reduction in urinary tract infection — Urinary tract infections (UTIs) are uncommon in males; the greatest risk is in male infants less than one year old. Studies consistently report that uncircumcised male infants are at higher risk of UTI compared with circumcised male infants. UTIs in infants can result in kidney infection requiring hospitalization and, rarely, severe infection and death. If the urinary tract is normal, long-term sequelae from UTI are unlikely.

Cancer — Cancer of the penis is rare, but uncircumcised men are at increased risk for developing the disease. Good hygiene and HPV immunization may reduce or negate this risk.

Cervical cancer is more common in women whose male sexual partners are not circumcised. HPV immunization may reduce or negate this risk.

Penile problems — Uncircumcised males are at increased risk for inflammation of the glans; this problem rarely occurs in circumcised men, as well. Uncircumcised boys who practice good penile hygiene are less likely to experience penile inflammation.

Infection — Studies suggest that circumcision helps decrease the risk of acquisition of human immunodeficiency virus (HIV), HPV, and probably herpes simplex virus type 2 (HSV-2), and also some evidence that it may protect against trichomonas and chancroid infection. Circumcision does not protect against infection from gonorrhea, chlamydia trachomatis, or syphilis. It is important to note, however, that many circumcised men acquire these diseases. Circumcision may lower the risk of acquiring the infection, but it does not eliminate it.

Hygiene — In the uncircumcised male, the space between the foreskin and the glans must be cleaned regularly. Proponents of circumcision argue that it is difficult for uncircumcised boys and men to maintain proper hygiene.

ADVERSE EFFECTS OF CIRCUMCISION

Procedural risks — An accurate complication rate is difficult to determine because the largest studies are based on coding diagnoses and inconsistent definitions. In addition, data have generally not been stratified to account for timing of the procedure, technique, provider type, setting, length of follow-up, timing of complications, and severity of complications.

- In two studies that included a total of over 200,000 circumcisions performed in United States hospitals, the rate of complications during and in the first month after the procedure was approximately 0.2 percent [4,5].
- A systematic review identified 16 prospective studies of complications following neonatal and infant circumcision by a variety of providers from 12 countries and primarily using the Plastibell [6]. The median frequency of any adverse event was 1.5 percent (range 0 to 16 percent) and the median frequency of any serious adverse event was 0 percent (range 0 to 2 percent); nine studies reported no serious adverse events, but three studies reported that 1 to 2 percent of boys had a serious complication. Complication rates were slightly lower in 10 retrospective studies.

Complications/sequelae of circumcision include:



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- Inadequate skin removal, which may result in an unsatisfactory cosmetic appearance and revision of the procedure. This is a common complaint, although the frequency is poorly documented in the literature.
- Bleeding, which is usually mild and controlled with local pressure, but surgical intervention and transfusion may be required on rare occasions.
- Infection, which is usually mild and treated by local antibiotics, but sepsis can occur and death has been reported.
- Urethral complications, including urethrocuteaneous fistula and meatal stenosis. Meatal stenosis can occur when urine from a wet diaper irritates the exposed ventral urethral meatus of the circumcised penis.
- Glans injury, including penile amputation
- Removal of excessive skin, which may result in a denuded penile shaft
- Epidermal inclusion cyst
- Adhesions, which range from mild to dense (also referred to as skin bridges)
- Cicatrix (a circumferential scar that usually develops at the incision line and is often associated with a hidden penis)
- Complications from anesthesia

Other considerations — The prepuce contains specialized sensory tissue that is removed during circumcision. Some men believe that the end of the penis becomes less sensitive when the foreskin is removed and that sexual sensation may be decreased. However, most circumcised males do not describe psychological trauma or decreased sexual function or desire as a result of the procedure.

Parents should be aware that some health plans do not cover the cost of circumcision. Parents should call their health plan directly to find out if the procedure is covered.

PAIN CONTROL DURING CIRCUMCISION

Studies in newborns have shown that signs of stress/pain occur during the circumcision procedure. These include crying, increased heart rate, and increased blood pressure.

Parents should discuss what pain control measures will be used before their child is circumcised. The American Academy of Pediatrics (AAP) recommends that all infants undergoing circumcision have adequate pain control during and after the procedure [7]. The American College of Obstetricians and Gynecologists (ACOG) supports the conclusions of the AAP and also states that pain control should be provided. Swaddling, oral sugar solutions, or acetaminophen may be given as well, but should not be used as the primary method of pain relief.

CIRCUMCISION PREPARATION AND PROCEDURE

Before circumcision, the doctor who will perform the procedure will review the informed consent. This is a discussion of the reasons for circumcision, the benefits, risks, and alternatives, and ensures that the parents understand what will happen during the procedure.

There are a few situations that may cause a circumcision to be delayed. For example, in babies who are born prematurely, circumcision is usually delayed until they are ready to be discharged from the hospital. Babies who are born with a defect of the penis should be evaluated by a urologist, who may recommend delaying circumcision. If there is a family history of a bleeding disorder or the baby has bleeding problems, circumcision is delayed until it has been determined that the baby is not at increased risk of bleeding during the procedure.

Technique — The infant is placed in a restraint ([picture 2](#)). The penis and an area of skin around the base of the penis are thoroughly cleaned.

There are several techniques for performing circumcision; the choice of which technique is used depends upon the physician's preference and experience. The three major methods of circumcision are the Gomco clamp, the Plastibell device, and the Mogen clamp. The procedure takes about 15 to 30 minutes.

Post-procedure care — After the circumcision is completed, a gauze dressing is usually applied ([picture 3A-B](#)). Use of a lubricant under the gauze helps to prevent it from sticking to the glans. The gauze should be removed and replaced with every diaper change for 24 hours. The circumcision site is cleaned with warm water and a cotton ball once or twice a day. Normally the infant urinates within 12 hours of the procedure.

After the first 24 hours, the gauze is omitted and the lubricant is applied directly to the penis for three to five days. This helps keep the area clean and keeps the wound site from adhering to the diaper. At first, the penis will appear red ([picture 4](#)). In a few days, a soft yellow scab will develop. This is normal and will go away in a few days. During this process, parents should watch for worsening redness, swelling, bleeding (larger than a quarter-size on the diaper) or drainage that does not go away. Any of these signs should prompt a call to the infant's healthcare provider.

Usually the penis needs no further care once it has healed.

PUBLIC AND PROFESSIONAL OPINIONS ON CIRCUMCISION

Professional societies and lay groups have expressed a wide range of views concerning the advantages and disadvantages of routine circumcision.

- In 2012, the [American Academy of Pediatrics](#) (AAP) task force on circumcision of the male infant concluded that "the health benefits of newborn male circumcision outweigh the risks; furthermore, the benefits of newborn male circumcision justify access to this procedure for families who choose it. Specific benefits from male circumcision were identified for the prevention of urinary tract infections, acquisition of HIV, transmission of some sexually transmitted infections, and penile cancer. Male circumcision does not appear to adversely affect penile sexual function/sensitivity or sexual satisfaction" [7]. Compared to their previous statement, this statement is a stronger affirmation of the health benefits of circumcision. However, the AAP did not recommend routine circumcision. They said, "Parents should weigh the health benefits and risks in light of their own religious, cultural, and personal preferences, as the medical benefits alone may not outweigh these other considerations for individual families" [7].



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MAKING A DECISION ABOUT CIRCUMCISION

Making the decision to circumcise an infant can be difficult for some parents. A father may be concerned that his son's penis appear similar to himself or to other men. Some parents may be concerned about the risks versus the benefits of the procedure. Other parents have no difficulty making a decision because of cultural or religious rules that require circumcision.

A decision is best made before the baby is born, although parents should feel comfortable discussing their questions or concerns with their healthcare provider after the child's birth. The procedure can be performed at the hospital before the mother and baby are discharged, or can be performed as an outpatient procedure with local anesthesia as late as three months after birth. After three months, the procedure usually requires general anesthesia.

WHERE TO GET MORE INFORMATION

Your child's healthcare provider is the best source of information for questions and concerns related to your child's medical problem.

This article will be updated as needed every on our Web site (www.uptodate.com/patients). Related topics for patients, as well as selected articles written for healthcare professionals, are also available. Some of the most relevant are listed below.

Patient level information — UpToDate offers two types of patient education materials.

The Basics — The Basics patient education pieces answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials.

[Patient information: Circumcision in baby boys \(The Basics\)](#)

[Patient information: Caring for an uncircumcised penis \(The Basics\)](#)

Beyond the Basics — Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are best for patients who want in-depth information and are comfortable with some medical jargon.

This topic currently has no corresponding Beyond the Basics content.

Professional level information — Professional level articles are designed to keep doctors and other health professionals up-to-date on the latest medical findings. These articles are thorough, long, and complex, and they contain multiple references to the research on which they are based. Professional level articles are best for people who are comfortable with a lot of medical terminology and who want to read the same materials their doctors are reading.

Neonatal circumcision: Risks and benefits

Techniques for neonatal circumcision

Complications of circumcision

Care of the uncircumcised penis

The following organizations also provide reliable health information.

- National Library of Medicine
(www.nlm.nih.gov/medlineplus/circumcision.html, available in many languages)
- American Academy of Pediatrics, Care of the Uncircumcised Penis
(www.cirp.org/library/normal/aap/)
- The Mayo Clinic
(<http://www.mayoclinic.com/health/circumcision/MY01023>)

[8-11]

Literature review current through: Mar 2013. |This topic last updated: Mar 22, 2013.

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