Examining Clinical Practice Guidelines for Male Circumcision: A Systematic Review and Critical Appraisal Using AGREE II

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Objective To identify and critically appraise available clinical practice guidelines (CPGs) targeting male circumcision using the Appraisal of Guidelines for Research & Evaluation II (AGREE II) instrument.

Study design A literature search was conducted using electronic databases, CPG databases, and national/international societies providing recommendations to guide clinical decision making for male circumcision. We selected pediatric-focused CPGs related to male circumcision published between January 2010 and December 2020. Non-English CPGs and publications involving narrative reviews, primary research, training manuals, patient and allied health professional guidelines, and technical guides were excluded from our search. Complete CPG documents (including full-text articles, supplemental documents, and associated information) were reviewed. Quality appraisal of CPGs was conducted in accordance with the AGREE II manual.

Results A total of 163 CPGs were identified, of which 93 were screened and 13 were reviewed. All AGREE II domains demonstrated good to excellent interrater reliability, with intraclass correlation coefficients ranging from 0.82 (95% CI, 0.72-0.89) to 0.93 (95% CI, 0.90-0.95). Most CPGs performed satisfactorily in the clarity of presentation domain and performed poorly in the applicability and editorial independence domains. The top 3 CPGs identified were those of the American Academy of Pediatrics, Centers for Disease Control and Prevention, and Canadian Urological Association. Consistencies among the CPGs were demonstrated across most recommendations.

Conclusions Current CPGs are of variable quality, and our findings should be taken into consideration by clinicians and health care professionals when selecting appropriate guidelines for male circumcision. *(J Pediatr 2022;244:186-93)*.

Male circumcision is one of the most common urologic procedures performed in newborn males,[1] with an estimated prevalence of 37%-39% among males globally.[2] Electively, male circumcision may be undertaken for protection against adverse medical conditions,[3] out of religious necessity,[4] or for cosmetic preference. From a therapeutic standpoint, male circumcision has been demonstrated to reduce the onset of urinary tract infections (UTIs)[5] and can be medically indicated for the treatment of phimosis, paraphimosis, or recurrent balanoposthitis.[6] A risk-benefit analysis published in the *Canadian Journal of Urology* demonstrated that the benefits of male circumcision outweigh the risks by approximately 100 to 1, and its lack contributes to adverse medical conditions.[7] Postoperative complications among circumcised males may encompass minor bleeding, inadequate skin removal, penile adhesions, and meatal stenosis.[8-10] Although rare (reported adverse event frequency for infant male circumcision, 1 in 250),[11] severe complications, such as infection or amputation,[12] have been documented in 1 in 20 000 cases in North America.[11] Severe complications were documented in 1 in 1000 cases in a study conducted by Weiss et al that included developed as well as developing countries, in which ritual and poorly performed circumcisions are not uncommon.[13]

The medical necessity of male circumcision has not been clearly established, resulting in conflicting clinical practice guideline (CPG) recommendations and inconsistent quality of evidence.

AAP	American Academy of Pediatrics
AGREE II	Appraisal of Guidelines for Research & Evaluation II
CDC	Centers for Disease Control and Prevention
CPG	Clinical practice guideline
CPS	Canadian Pediatric Society
CUA	Canadian Urological Association
HPV	Human papillomavirus
ICC	Intraclass correlation coefficient
MSM	Men who have sex with men
STI	Sexually transmitted infection
UTI	Urinary tract infection

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The authors declare no conflicts of interest.

0022-3476/$ - see front matter.
https://doi.org/10.1016/j.jpeds.2021.12.073

The Appraisal of Guidelines for Research & Evaluation (AGREE) instrument, created by a team of international guideline developers, comprises 23 key items organized into 6 domains to aid the evaluation of guideline quality.[14] A refined version of the tool, AGREE II, was later introduced with improved reliability and validity and is now the consortium's preferred instrument for assessing the methodologic rigor and transparency of CPGs.[14-17] Our objectives in the present review were to assess the quality of current CPGs regarding male circumcision using the AGREE II instrument and to summarize the top 3 CPGs identified by AGREE II based on guideline objectives and recommendations.

Methods

Literature Search

Our systematic review was conducted in compliance with the PRISMA statement.[18] Using electronic databases, a licensed librarian and informatic reference specialist performed a systematic and extensive literature search of CPGs for male circumcision that have been endorsed by national/international societies providing recommendations to guide clinical decision-making for male circumcision. Databases and sites searched were Turning Research Into Practice, CPG Infobase, Canadian Pediatric Society (CPS), American Academy of Pediatrics (AAP), Canadian Urological Association (CUA), World Health Organization, Centers for Disease Control and Prevention (CDC), European Association of Urology, National Institute for Health and Care Excellence, South African Medical Association, Geneva Foundation for Medical Education and Research, Australian Clinical Practice Guideline (www.clinicalguidelines.gov.au), International Guideline Library (www.g-i-n.net), Agency for Healthcare Research and Quality, and Google Scholar. Sources published between January 1, 2010, and December 31, 2020, were searched using free text ("circumcision," "male circumcision," "guideline," "clinical practice guideline") and Boolean function with "male or infan* or neonat*" search strategies.

Non-English CPGs and publications involving narrative reviews, primary research, training manuals, patient and allied health professional guidelines, or technical guides were excluded from our search. To limit redundancy, we refrained from including CPGs from a subsection or suborganization of an umbrella professional organization if the umbrella organization's CPG was already included. To ensure the incorporation of up-to-date guidelines, we considered only the latest version of the CPGs in our search. Complete CPG documents (including full-text articles, supplemental documents, and associated information) were reviewed. Disagreements between reviewers during screening were resolved by a mediator.

AGREE II

Quality appraisal of CPGs was conducted using the AGREE II instrument and in accordance with the AGREE II manual.[15] The tool consists of 23 key items compartmentalized into 6 domains targeting differing aspects of guideline quality: domain 1, scope and purpose; domain 2, stakeholder involvement; domain 3, rigor of development; domain 4, clarity of presentation; domain 5, applicability; and domain 6, editorial independence. Each item within a domain is rated on a 7-point Likert scale, where 1 represents "strongly disagree" and 7 represents "strongly agree." An overall assessment category is included to collect general guideline quality ratings and recommendations for their use by reviewers.

Independent Review

A review team consisting of 4 physician representatives from different specialties (general pediatrics, pediatric general surgery, pediatric urology, and general urology) with experience in the clinical setting was established. The CPGs were reviewed independently by each team member, and domain ratings for each guideline were collected. A field expert was consulted in the event of emerging discrepancies among the review team and to ensure consistency during critical appraisal.

Data Analyses

Interrater reliability was assessed by computing intraclass correlation coefficients (ICCs) using SPSS version 14.0 (IBM). Excellent, good, moderate, and weak interrater reliability was indicated by ICCs of >0.9, 0.75-0.9, 0.5-<0.75, and <0.5, respectively.[19] Standardized domain scores were calculated according to the calculation provided in the AGREE II manual:

$$\text{scaled domain score} = \frac{\text{obtained score} - \text{minimum possible score}}{\text{maximum possible score} - \text{minimum possible score}}.$$

For the purpose of our analysis, domain scores >60% were considered satisfactory. The 3 CPGs with the highest number of domain scores >60% were summarized by a member independent of the review team based on CPG objectives and recommendations.

Results

Identification of Male Circumcision CPGs

Search results are summarized in the **Figure** (available at www.jpeds.com). A total of 163 records were identified. After the removal of duplicates, 93 records remained, 57 of which were excluded after initial screening. Reasons for exclusion after in-text screening included adult-only guidelines (n = 3), guidelines pertaining to specific pathologies (n = 6) or not endorsed by any organization (n = 1), product-related statements (n = 2), parental leaflets (n = 1), pain prevention or management guidelines (n = 2), non-CPGs (n = 7), and non-relevant CPGs (n = 1). After exclusions, 13 CPGs remained for in-depth review: those of the American Academy of Family Physicians,[20] AAP,[21] American Urological Association,[22] Canadian Agency for Drugs and Technologies in Health,[23]

Table I. Descriptive characteristics of the CPGs reviewed

Abbreviation	Year of publication	Country of origin	Name of organization
CUA	2018	Canada	Canadian Urological Association
CDC	2019	US	Centers for Disease Control and Prevention
AAP	2012	US	American Academy of Pediatrics
RCS	2016	United Kingdom	The Royal College of Surgeons of England
UNAIDS & WHO	2010	International	Joint United Nations Program on HIV/AIDS & World Health Organization
SA NDoH	2016	South Africa	South African National Department of Health
RACP	2010	Australia	Royal Australasian College of Physicians
CPS	2015	Canada	Canadian Pediatric Society
EAU	2021	International	European Association of Urology
CADTH	2015	Canada	Canadian Agency for Drugs and Technologies in Health
KNMG	2010	Netherlands	Royal Dutch Medical Association
AAFP	2020	US	American Academy of Family Physicians
AUA	2020	US	American Urological Association

CDC,[24-26] CPS,[6] CUA,[9] European Association of Urology,[27] Royal Dutch Medical Association,[28] Royal Australasian College of Physicians,[29] Royal College of Surgeons in England,[30] South African National Department of Health,[31] and World Health Organization & Joint United Nations Programme on HIV/AIDS[32] (Table I).

Interrater Reliability and CPG Quality Reporting

Reviewer CPG ratings for each domain demonstrated good to excellent interrater reliability, with ICCs ranging from 0.82 (95% CI, 0.72-0.98; domain 5) to 0.93 (95% CI, 0.90-0.95; domain 3) (Table II). Standardized domain scores, as well as average and overall domain scores for each CPG, are displayed in Table III. In general, the AAP, CDC, and CUA guidelines scored the highest among all reviewers (4 domain scores >60%; 46%-78% for AAP, 52%-96% for CDC, and 35%-99% for CUA), and the American Academy of Family Physicians and American Urological Association guidelines scored the lowest (both with no domain scores >60%). More than one-half (8 of 13; 62%) of the CPGs scored satisfactorily for the clarity of presentation domain. The lowest scores were reported for the editorial independence and applicability domains (1 of 13 [8%] and 0 CPGs scoring >60%, respectively).

Review of Key Recommendations of the Top 3 CPGs

A summary of the top 3 CPGs is provided in Table IV (available at www.jpeds.com).

Table II. ICCs for overall, average, and individual AGREE II domain scores

Domains	ICC average measure (95% CI)
Domain 1: Scope and purpose	0.84 (0.74-0.91)
Domain 2: Stakeholder involvement	0.83 (0.73-0.91)
Domain 3: Rigor of development	0.93 (0.90-0.95)
Domain 4: Clarity of presentation	0.86 (0.77-0.92)
Domain 5: Applicability	0.82 (0.72-0.89)
Domain 6: Editorial independence	0.89 (0.81-0.95)
Overall domain score	0.90 (0.78-0.97)
Average domain score	0.89 (0.87-0.91)

Parent/Patient Decision Making

The AAP guideline states that parents should be provided with factually correct information on male circumcision when circumcision decisions are usually made, before conception or early in pregnancy. Physicians are encouraged to explain the elective procedure in a nonbiased fashion and to convey its benefits and risks to families in a manner that can be readily understood. Similarly, the CDC guideline recommends that benefits and risks, as well as an understanding of other factors such as religion, social norms and customs, and aesthetic preference, should be considered when discussing elective male circumcision with patients or families. In addition, the CDC recommends that adolescent minors be included in the decision making process along with their parents when considering elective male circumcision.

Phimosis

The CUA guideline recommends routine examination of the neonatal foreskin and urethral meatus to rule out pathologic phimosis. Male circumcision is contraindicated in the presence of persistent physiologic phimosis for which a child is asymptomatic. Physiologic phimosis associated with balanoposthitis or recurrent UTIs should be treated with topical steroids, and steps should be taken to ensure patient compliance. If physiologic phimosis is recurrent, another course of topical steroids is recommended.

UTIs

Although neonatal male circumcision decreases the risk of UTIs, there is a scarcity of evidence to propose universal male circumcision to prevent UTIs in normal males. However, in neonates with urologic abnormalities, the CUA guideline recommends a discussion on with parents for this patient cohort. Guidance of the CDC statement on circumcision with respect to UTI risk was influenced by a meta-analysis that calculated a 32.1% (95% CI, 15.6%-49.8%) lifetime risk of developing a UTI among uncircumcised males, compared with 8.8% (95% CI, 4.15%-13.2%) in circumcised males.[5]

Table III. Overall, average, and individual AGREE II domain scores for the included CPGs

Domains	CUA 2018	CDC 2019	AAP 2012	RCS 2016	UNAIDS & WHO 2010	SA NDoH 2016	RACP 2010	CPS 2015	EAU 2021	CADTH 2015	KNMG 2010	AAFP 2020	AUA 2020
Overall domain score	75	71	68	57	54	43	43	39	32	21	18	4	4
Average domain score	70	72	65	49	38	53	34	51	57	19	30	15	14
Domain 1: scope and purpose	99	81	76	43	22	75	72	82	68	53	58	22	24
Domain 2: stakeholder involvement	46	69	65	39	38	35	47	61	22	8	32	4	1
Domain 3: rigor of development	73	79	76	22	39	31	17	50	68	35	58	7	4
Domain 4: clarity of presentation	99	96	78	72	39	78	51	89	89	19	65	57	57
Domain 5: applicability	35	52	46	38	49	60	18	26	6	0	5	0	0
Domain 6: editorial independence	71	54	50	79	42	40	0	0	75	0	0	0	0
Overall assessment	Yes	Yes	Yes*	Yes	Yes	Yes*	Yes	Yes*	Yes	No	No	No	No

*With modifications.

Sexually Transmitted Infections

The CUA guideline does not recommend universal male circumcision for the prevention of HIV based on current available evidence. Because it is uncertain whether neonatal male circumcision may provide a protective effect against human papillomavirus (HPV) transmission, the CUA guideline states that HPV vaccination along with behavioral modifications may be more effective than universal male circumcision in lowering the prevalence and incidence of HPV. The guideline also mentions that there is no significant evidence to support a protective role of male circumcision in the onset of nonulcerative sexual transmitted infection (STIs).

The CDC guideline states that male circumcision offers protection against STIs. Preventive behavioral strategies, such as limiting sexual partners, consistent condom use, and prophylaxis before and after exposure to HIV, should be considered. Men who have sex with men (MSM) should be informed that there are limitations to the data describing the relationship between male circumcision and acquisition of HIV and other STIs, and that results differ based on insertive or receptive sexual practices. The guideline also advises that sexually active males be informed of the potential reduction in the risk of HIV and STI with male circumcision, as well as the risks involved with the procedure, including a 0.4% risk of an adverse (and typically treatable) event for infant circumcision and a 10- to 20-fold higher risk of complications in older boys, adolescents, and men.[11] If the decision is made to undergo male circumcision, a surgical consultation should be provided.

Penile and Prostate Cancer

The CUA guideline does not deem universal neonatal male circumcision necessary for preventing penile cancer, owing to the low incidence of invasive penile cancer, acclaimed partial protective effect of male circumcision, and other preventative strategies currently available. However, it recommends the routine recognition and treatment of phimosis to decrease the risk of penile cancer, along with a genitourinary examination during puberty. Although penile cancer is rare in circumcised men,[33] uncircumcised men have an approximately 1 in 1000 lifetime risk of penile cancer.[34] High-risk HPV is present in 47% of cases,[35] and whereas phimosis increases the risk by 12-fold, balanitis and smegma are also associated with elevated risk.[36]

Routine genitourinary examination may be unrealistic during the time of puberty and are obviated once patients disclose their circumcision status to their physicians, with only uncircumcised patients subjected to genitourinary inspection. The guideline also refrains from recommending male circumcision for reduced prostate cancer risk.

Analgesia and Anesthesia

The CUA guideline recommends the use of a dorsal penile nerve block with a ring block rather than topical anesthetics alone during neonatal male circumcision. Interventions including, but not limited to, oral sucrose, nonnutritive sucking, and music should be used only in addition to the recommended technique. Similarly, the AAP guideline recommends a penile nerve block, as the use of nonpharmacologic techniques as the sole method of analgesia is considered insufficient for preventing pain. The AAP guideline also mentions that topical creams may lead to skin irritation in low birth weight infants and advises caution with their use.

Complications

The CUA guideline recommends proper reporting and auditing by the operator to ensure procedural safety and recognition of potential contraindications. Likewise, the AAP and CDC guidelines call for male circumcision to be performed by experienced and properly trained individuals using appropriate techniques and pain management practices.

Workforce Development

The AAP guideline encourages professional organizations to work together in an effort to establish standards that provide trainees with a high degree of proficiency, provide opportunities for teaching male circumcision and analgesic techniques to students in postgraduate programs, generate educational materials for clinicians to enhance competency, and offer educational materials to parents and/or patients.

Discussion

We used the AGREE II instrument to critically appraise available male circumcision guidelines. The AGREE II tool provided us with a standardized approach to the critical appraisal of available CPGs. Using this instrument, domain ratings collected by our reviewers demonstrated a high degree

of agreement among members. Our findings showcase the range in the quality of the 13 CPGs included in our review when comparing individual, overall, and average domain scores. Relatively high scores for the clarity of presentation domain demonstrate that most recommendations are specific, lack ambiguity, and are able to clearly present various options for the management of male circumcision.

In our review, most guidelines demonstrated relatively poor ratings in the domains of applicability and editorial independence. According to AGREE II, a guideline may score poorly in the applicability domain when it does not adequately describe the facilitators and barriers to its application, fails to consider the implications of applying the recommendations or present monitoring and/or auditing criteria, and does not instruct users on how the guidelines should be properly implemented in practice.[15] However, scoring poorly in the editorial independence domain indicates that the content of the guideline may have been influenced by the funding body, and that competing interests have not been fully disclosed.[15] This is particularly important when considering the focus of our review, as male circumcision is often a culturally determined practice that elicits polarizing beliefs and opinions.[37,38] In a Cochrane Review examining the relationship between male circumcision and heterosexual HIV acquisition, the authors stated the importance of acknowledging the personal biases of researchers and the predominant male circumcision practices within their respective countries as potential influences in the interpretation of their study findings.[39] It is imperative that users of male circumcision guidelines are aware of these influences when choosing the most appropriate guideline for their practice.

Our top 3 CPGs exhibited the highest number of satisfactory scores across the 5 domains among all the guidelines reviewed. Of the top 3, the AAP guideline was the first one published (2012, vs 2017 for CUA and 2018 for CDC). The CDC supports the AAP statement,[40] agrees that the benefits exceed the risks (by as much as a factor of 100:1[25]), and rather than arguing for or against male circumcision, presents strong evidence showcasing the protective medical benefits associated with the procedure. A notable distinction among the top 3 guidelines is the targeted population. Whereas the CUA and AAP statements focus on newborns and pediatric cohorts, the CDC guideline extends its recommendations to include adolescent and adult males. After its release, the AAP CPG was met with criticism by Frisch et al,[41] who suggested that the conclusions presented differ from those reached by non-Western physicians, and that most of the protective effects of male circumcision mentioned by the guideline have little relevance in Western cultures.[41] In response, the AAP Task Force on Circumcision argued that, given the diversity and frequency of circumcision in the US, where circumcision rates are more evenly balanced compared with the lack of circumcision in Europe, cultural bias was more likely to apply in Europe than in the US.[42] The CDC guideline received similar criticism.[43,44] The CDC released a response to the public criticism as part of its final statement,[40] and rebuttals to critiques have been published stating that the recommendations are appropriate and should be considered for policy development.[45,46]

All the top 3 CPGs recommend routine examination to rule out pathologic phimosis; however, it should be noted that persistent, phimosis, whether primary or secondary/physiologic, can result in distress to the patient via increased pain, sexual dysfunction, risk of penile inflammatory conditions such as balanitis, and penile cancer. Steroid creams for phimosis are not always effective,[47] leaving circumcision as the definitive treatment option.[48,49] Moreover, although the CUA guideline refrains from recommending male circumcision as a protective effect against prostate cancer, it has been documented that countries with a high circumcision rate have lower prostate cancer-related mortality after correction for confounding factors,[50] and meta-analyses have found a 10% lower risk of prostate cancer in circumcised men.[51,52] Thus, the reduced risk of prostate cancer associated with circumcision should be considered.

Despite the recommendations proposed by the CUA, risk-benefit analyses have demonstrated that not circumcising males is associated with a higher relative risk of STI acquisition compared with circumcising males.[7,53] In addition, although the CUA guideline does not recommend universal male circumcision for the prevention of HIV, the HIV risk reduction is not significantly lower, because most HIV diagnoses are in MSM.[54] However, MSM who adopt the insertive role have a similar risk reduction as heterosexual men, indicating an increased risk for receptive roles and HIV infection.[55] Even though HPV vaccination is suggested as potentially more effective than male circumcision alone in the CUA guideline, it is worth mentioning that HPV vaccines are not directed at all of the more than 14 mucosotropic HPV genotypes and that overall vaccine uptake in the 10- to 20-year age group in high-income countries is 33.6%.[56] Moreover, the effectiveness of vaccination against HPV has been demonstrated to be similar to that of circumcision,[57-63] making early circumcision plus vaccination superior to vaccination alone.

Notwithstanding the limited discussion in the guidelines regarding the issue of performing a non-medically indicated circumcision in a minor who cannot consent, some would argue that the decision to undergo the procedure should be postponed until the individual is capable of making an informed choice. In a survey distributed to adult men with adverse neonatal circumcision outcomes, respondents not only expressed harm related to their sexual and physical health as well as self-esteem, but also were found to exhibit psychological/emotional troubles stemming from their condition in the form of dissatisfaction, frustration, anger, violation, and betrayal.[64] It is important to note, however, that the survey participants included men who believed they had been harmed by their infant circumcision and that men who did not have this belief were excluded; a critical evaluation of this survey was performed by Bailis et al.[65] Moreover, it can be argued that discussions surrounding neonatal or childhood circumcision are comparable to

other low-risk interventions with immediate and lifetime benefits that greatly surpass the risks, such as childhood vaccinations. Nonetheless, the bioethical quandary of electively circumcising nonconsenting minors should be considered in forthcoming CPGs.

Our study has several strengths. We kept our literature search broad to encompass not only neonatal male circumcision recommendations from pediatric associations, but also guidelines targeting male circumcision beyond the neonatal period. We also were able to isolate and compare in detail 3 CPGs that performed best based on our critical appraisal. Moreover, our study findings are particularly strengthened by the use of 4 distinct reviewers (the number of reviewers recommended in the AGREE II User Manual) who are clinical experts, have substantial knowledge of the CPG topic, and have experience with critical appraisal and evidence synthesis. An independent and blinded review ensured that ratings were not influenced by other members of the critical appraisal team, thereby reducing the potential for social desirability bias among reviewers.

Our study is not without limitations. We restricted our review to English-language CPGs and did not explore the potential of recently published non-English guidelines. Although the AGREE II instrument has been rigorously validated, some of the study's limitations are intrinsic to the instrument itself. Although we were able to compare CPGs, the lack of set cutoff values for domain scores hindered our ability to classify guidelines as high quality or low quality. Previous critical appraisals that have used the instrument have arbitrarily chosen a cutoff value of >70%[66,67] or >60%[68-71] to classify a score as good/acceptable, yet the potential subjectivity resulting from choosing cutoff values not based on sound evidence may lead to questionable interpretation, and caution must be taken. In addition, although we acknowledge that the reviews and supplementary material provided by the top 3 CPGs cover a breadth of topics, we limited the summary of our top guidelines to the recommendations put forth by each organization. Moreover, AGREE II lacks a comprehensive assessment of the evidence backing such recommendations, such as risk of bias, precision, and consistency, that are typically included in the Grading of Recommendations, Assessment, Development and Evaluations framework.[72,73] A more in-depth review of the evidence base behind the recommendations would strengthen our critical appraisal. ■

Submitted for publication Oct 6, 2021; last revision received Dec 16, 2021; accepted Dec 20, 2021.

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References

1. World Health Organization, Department of Reproductive Health and Research and Joint United Nations Programme on HIV/AIDS. Male circumcision: global trends and determinants of prevalence, safety and acceptability. 2007. Accessed April 19, 2020. https://www.who.int/reproductivehealth/publications/rtis/9789241596169/en/
2. Morris BJ, Wamai RG, Henebeng EB, Tobian AAR, Klausner JD, Banerjee J, et al. Estimation of country-specific and global prevalence of male circumcision. Popul Health Metr 2016;14:1-13.
3. Xu B, Goldman H. Newborn circumcision in Victoria, Australia: reasons and parental attitudes. ANZ J Surg 2008;78:1019-22.
4. Massry SG. History of circumcision: a religious obligation or a medical necessity. J Nephrol 2011;24(Suppl 17):S100-2.
5. Morris BJ, Wiswell TE. Circumcision and lifetime risk of urinary tract infection: a systematic review and meta-analysis. J Urol 2013;189:2118-24.
6. Canadian Paediatric Society. Newborn male circumcision. 2015. Accessed March 15, 2020. https://www.cps.ca/en/documents/position/circumcision
7. Morris BJ, Klausner JD, Krieger JN, Willcox BJ, Crouse PD, Pollock N. Canadian Pediatrics Society position statement on newborn circumcision: a risk-benefit analysis revisited. Can J Urol 2016;23:8495-502.
8. Talini C, Antunes LA, de Carvalho BCN, Schultz KL, Del Valle MHCP, Aranha AA Jr, et al. Circumcision: postoperative complications that required reoperation. Einstein (Sao Paulo) 2018;16:eAO4241.
9. Dave S, Afshar K, Braga LH, Anderson P. Canadian Urological Association guideline on the care of the normal foreskin and neonatal circumcision in Canadian infants (full version). Can Urol Assoc J 2018;12:E76-99.
10. Wang MH. Surgical management of meatal stenosis with meatoplasty. J Vis Exp 2010: 2213.
11. El Bcheraoui C, Zhang X, Cooper CS, Rose CE, Kilmarx PH, Chen RT. Rates of adverse events associated with male circumcision in US medical settings, 2001 to 2010. JAMA Pediatr 2014;168:625-34.
12. Faydaci G, Uğur K, Osman C, Şermin Ş, Bilal E. Amputation of glans penis: a rare circumcision complication and successful management with primary anastomosis and hyperbaric oxygen therapy. Korean J Urol 2011;52:147-9.
13. Weiss HA, Larke N, Halperin D, Schenker I. Complications of circumcision in male neonates, infants and children: a systematic review. BMC Urol 2010;10:2.
14. Makarski J, Brouwers MC. The AGREE Enterprise: a decade of advancing clinical practice guidelines. Implement Sci 2014;9:103.
15. Brouwers MC, Kho ME, Browman GP, Burgers JS, Cluzeau F, Feder G, et al. AGREE II: advancing guideline development, reporting and evaluation in health care. CMAJ 2010;182:E839-42.
16. Brouwers MC, Kho ME, Browman GP, Burgers JS, Cluzeau F, Feder G, et al. Development of the AGREE II, part 1: performance, usefulness and areas for improvement. CMAJ 2010;182:1045-52.
17. Brouwers MC, Kho ME, Browman GP, Burgers JS, Cluzeau F, Feder G, et al. Development of the AGREE II, part 2: assessment of validity of items and tools to support application. CMAJ 2010;182:E472-8.
18. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gøtzsche PC, Ioannidis JPA, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. PLoS Med 2009;6:e1000100.
19. Koo TK, Li MY. A guideline of selecting and reporting intraclass correlation coefficients for reliability research. J Chiropr Med 2016;15:155-63.
20. American Academy of Family Physicians. Neonatal circumcision. Accessed May 15, 2020. https://www.aafp.org/about/policies/all/neonatal-circumcision.html
21. American Academy of Pediatrics. Circumcision policy statement. 2012. Accessed May 10, 2020. https://pediatrics.aappublications.org/content/pediatrics/130/3/585.full.pdf
22. American Urological Association. Circumcision. Accessed May 10, 2020. https://www.auanet.org/guidelines/guidelines/circumcision
23. Canadian Agency for Drugs and Technologies in Health. Newborn male circumcision for the prevention of sexually transmitted infections, urinary tract infections, and cancer: clinical effectiveness and guidelines. 2015. Accessed May 21, 2020. https://www.cadth.ca/sites/default/files/pdf/htis/feb-2015/RB0785 Newborn Circumcision Final.pdf
24. Centers for Disease Control and Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (US), Division of HIV/AIDS Prevention. Background, methods, and synthesis of scientific

information used to inform "Information for Providers to Share with Male Patients and Parents Regarding Male Circumcision and the Prevention of HIV Infection, Sexually Transmitted Infections, and other Health Outcomes". 2018. Accessed May 25, 2020. https://stacks.cdc.gov/view/cdc/58457
25. Centers for Disease Control and Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (U.S.), Division of HIV/AIDS Prevention. Information for providers counseling male patients and parents regarding male circumcision and the prevention of HIV infection, STIs, and other health outcomes. 2018. Accessed June 5, 2020. https://stacks.cdc.gov/view/cdc/58456
26. Centers for Disease Control and Prevention. Male circumcision. 2019. Accessed April 17, 2020. https://www.cdc.gov/hiv/risk/male-circumcision.html
27. European Association of Urology. EAU Guidelines on paediatric urology. Accessed March 28, 2020. https://uroweb.org/wp-content/uploads/EAU-Guidelines-Paediatric-Urology-2016.pdf
28. KNMG (Royal Dutch Medical Association). Non-therapeutic circumcision of male minors. 2010. Accessed April 20, 2020. https://www.knmg.nl/circumcision/
29. Royal Australasian College of Physicians. Circumcision of infant males. 2010. Accessed March 29, 2020. https://www.racp.edu.au//docs/default-source/advocacy-library/circumcision-of-infant-males.pdf?sfvrsn=eaa32f1a_10
30. Royal College of Surgeons of England. Foreskin conditions—commissioning guide. 2016. Accessed March 29, 2020. https://www.rcseng.ac.uk/library-and-publications/rcs-publications/docs/foreskin-conditions/
31. South African National Department of Health. South African national guidelines for medical male circumcision. Accessed April 7, 2020. https://www.knowledgehub.org.za/elibrary/south-african-national-guidelines-medical-male-circumcision
32. World Health Organization and Joint United Nations Programme on HIV/AIDS. Neonatal and child male circumcision: a global review. 2010. Accessed May 5, 2020. https://www.who.int/hiv/pub/malecircumcision/neonatal_child_MC_UNAIDS.pdf
33. Wiswell TE. Circumcision circumspection. N Engl J Med 1997;336:1244-5.
34. Kochen M, McCurdy S. Circumcision and the risk of cancer of the penis. A life-table analysis. Am J Dis Child 1980;134:484-6.
35. Albero G, Castellsagué X, Giuliano AR, Bosch FX. Male circumcision and genital human papillomavirus: a systematic review and meta-analysis. Sex Transm Dis 2012;39:104-13.
36. Morris BJ, Gray RH, Castellsague X, Bosch FX, Halperin DT, Waskett JH, et al. The strong protective effect of circumcision against cancer of the penis. Adv Urol 2011;2011:812368.
37. Spense J, Meller J, Abbey J, Foster K, Sirri C, Naqvi M. Why are we cutting? A survey of cultural views on circumcision in the Texas panhandle. Glob Pediatr Health 2017;4:2333794X17711767.
38. Coene G, Saharso S. Gender and cultural understandings in medical nonindicated interventions: a critical discussion of attitudes toward nontherapeutic male circumcision and hymen (re)construction. Clin Ethics 2019;14:33-41.
39. Siegfried N, Muller M, Deeks JJ, Volmink J. Male circumcision for prevention of heterosexual acquisition of HIV in men. Cochrane Database Syst Rev 2009;2:CD003362.
40. Centers for Disease Control and Prevention. Summary of public comments and CDC responses to public comments for Information for Providers to Share with Male Patients and Parents Regarding Male Circumcision and the Prevention of HIV infection, Sexually Transmitted Infections, and other Health Outcomes. Accessed May 8, 2020. https://www.cdc.gov/hiv/pdf/risk/MC-HISA-Public-Comments-and-Responses.pdf
41. Frisch M, Aigrain Y, Barauskas V, Bjarnason R, Boddy SA, Czauderna P, et al. Cultural bias in the AAP's 2012 technical report and policy statement on male circumcision. Pediatrics 2013;131:796-800.
42. Task Force on Circumcision. Cultural bias and circumcision: the AAP task force on circumcision responds. Pediatrics 2013;131:801-4.
43. Adler PW. The draft CDC circumcision recommendations: medical, ethical, legal, and procedural concerns. Int J Child Rights 2016;24:239-64.
44. Frisch M, Earp BD. Circumcision of male infants and children as a public health measure in developed countries: a critical assessment of recent evidence. Glob Public Health 2018;13:626-41.
45. Rivin BE, Diekema DS, Mastroianni AC, Krieger JN, Klausner JD, Morris BJ. Critical evaluation of Adler's challenge to the CDC's male circumcision recommendations. Int J Child Rights 2016;24:265-303.
46. Morris BJ, Krieger JN, Klausner JD. CDC's male circumcision recommendations represent a key public health measure. Glob Heal Sci Pract 2017;5:15-27.
47. Folaranmi SE, Corbett HJ, Losty PD. Does application of topical steroids for lichen sclerosus (balanitis xerotica obliterans) affect the rate of circumcision? A systematic review. J Pediatr Surg 2018;53:2225-7.
48. Dave S, Afshar K, Braga LH, Anderson P. Canadian Urological Association guideline on the care of the normal foreskin and neonatal circumcision in Canadian infants (abridged version). Accessed April 20, 2020. https://cuaj.ca/index.php/journal/article/view/5033
49. Morris BJ, Matthews JG, Krieger JN. Prevalence of phimosis in males of all ages: systematic review. Urology 2020;135:124-32.
50. Wachtel MS, Yang S, Morris BJ. Countries with high circumcision prevalence have lower prostate cancer mortality. Asian J Androl 2016;18:39-42.
51. Li Y, Teng Y, Dai Y, Ding H. The association of circumcision and prostate cancer: a meta-analysis. Asian Pac J Cancer Prev 2016;17:3823-7.
52. Morris BJ, Matthews JG, Pabalan N, Moreton S, Krieger JN. Male circumcision and prostate cancer: a meta-analysis revisited. Can J Urol 2021;28:10768-76.
53. Morris BJ, Bailis SA, Wiswell TE. Circumcision rates in the United States: rising or falling? What effect might the new affirmative pediatric policy statement have? Mayo Clin Proc 2014;89:677-86.
54. Wiysonge CS, Kongnyuy EJ, Shey M, Muula AS, Navti OB, Akl EA, et al. Male circumcision for prevention of homosexual acquisition of HIV in men. Cochrane Database Syst Rev 2011;6:CD007496.
55. Templeton DJ, Jin F, Mao L, Prestage GP, Donovan B, Imrie J, et al. Circumcision and risk of HIV infection in Australian homosexual men. AIDS 2009;23:2347-51.
56. Bruni L, Diaz M, Barrionuevo-Rosas L, Herrero R, Bray F, Bosch FX, et al. Global estimates of human papillomavirus vaccination coverage by region and income level: a pooled analysis. Lancet Glob Health 2016;4:e453-63.
57. Zhu YP, Jia ZW, Dai B, Ye DW, Kong YY, Chang K, et al. Relationship between circumcision and human papillomavirus infection: a systematic review and meta-analysis. Asian J Androl 2017;19:125-31.
58. Backes DM, Bleeker MCG, Meijer CJLM, Hudgens MG, Agot K, Bailey RC, et al. Male circumcision is associated with a lower prevalence of human papillomavirus-associated penile lesions among Kenyan men. Int J Cancer 2012;130:1888-97.
59. Gray RH, Serwadda D, Kong X, Makumbi F, Kigozi G, Gravitt PE, et al. Male circumcision decreases acquisition and increases clearance of high-risk human papillomavirus in HIV-negative men: a randomized trial in Rakai, Uganda. J Infect Dis 2010;201:1455-62.
60. Senkomago V, Backes DM, Hudgens MG, Poole C, Agot K, Moses S, et al. Acquisition and persistence of human papillomavirus 16 (HPV-16) and HPV-18 among men with high-HPV viral load infections in a circumcision trial in Kisumu, Kenya. J Infect Dis 2015;211:811-20.
61. Tobian AA, Serwadda D, Quinn TC, Kigozi G, Gravitt PE, Laeyendecker O, et al. Male circumcision for the prevention of HSV-2 and HPV infections and syphilis. N Engl J Med 2009;360:1298-309.
62. Wilson LE, Gravitt P, Tobian AAR, Kigozi G, Serwadda D, Nalugoda F, et al. Male circumcision reduces penile high-risk human papillomavirus viral load in a randomised clinical trial in Rakai, Uganda. Sex Transm Infect 2013;89:262-6.
63. Auvert B, Sobngwi-Tambekou J, Cutler E, Nieuwoudt M, Lissouba P, Puren A, et al. Effect of male circumcision on the prevalence of high-risk human papillomavirus in young men: results of a randomized controlled trial conducted in Orange Farm, South Africa. J Infect Dis 2009;199:14-9.

64. Hammond T, Carmack A. Long-term adverse outcomes from neonatal circumcision reported in a survey of 1,008 men: an overview of health and human rights implications. Int J Hum Rights 2017;21:189-218.
65. Bailis SA, Moreton S, Morris BJ. Critical evaluation of a survey claiming "long-term adverse outcomes from neonatal circumcision.". Adv Sex Med 2019;9:67-109.
66. Duda S, Fahim C, Szatmari P, Bennett K. Is the National Guideline Clearinghouse a trustworthy source of practice guidelines for child and youth anxiety and depression? J Can Acad Child Adolesc Psychiatry 2017;26:86-97.
67. Chua M, Ming J, Chang SJ, Dos Santos J, Mistry N, Silangcruz JM, et al. A critical review of recent clinical practice guidelines for pediatric urinary tract infection. Can Urol Assoc J 2018;12:112-8.
68. Messina C, Bignotti B, Tagliafico A, Orlandi D, Corazza A, Sardanelli F, et al. A critical appraisal of the quality of adult musculoskeletal ultrasound guidelines using the AGREE II tool: an EuroAIM initiative. Insights Imaging 2017;8:491-7.
69. Eady EA, Layton AM, Sprakel J, Arents BWM, Fedorowicz Z, van Zuuren EJ. AGREE II assessments of recent acne treatment guidelines: how well do they reveal trustworthiness as defined by the U.S. Institute of Medicine criteria? Br J Dermatol 2017;177:1716-25.
70. Brosseau L, Rahman P, Toupin-April K, Poitras S, King J, De Angelis G, et al. A systematic critical appraisal for non-pharmacological management of osteoarthritis using the appraisal of guidelines research and evaluation II instrument. PLoS One 2014;9:e82986.
71. Yan J, Min J, Zhou B. Diagnosis of pheochromocytoma: a clinical practice guideline appraisal using AGREE II instrument. J Eval Clin Pract 2013;19:626-32.
72. de Castro Maymone MB, Gan SD, Bigby M. Evaluating the strength of clinical recommendations in the medical literature: GRADE, SORT, and AGREE. J Invest Dermatol 2014;134:1-5.
73. Sekercioglu N, Al-Khalifah R, Ewusie JE, Elias RM, Thabane L, Busse JW, et al. A critical appraisal of chronic kidney disease mineral and bone disorders clinical practice guidelines using the AGREE II instrument. Int Urol Nephrol 2017;49:273-84.

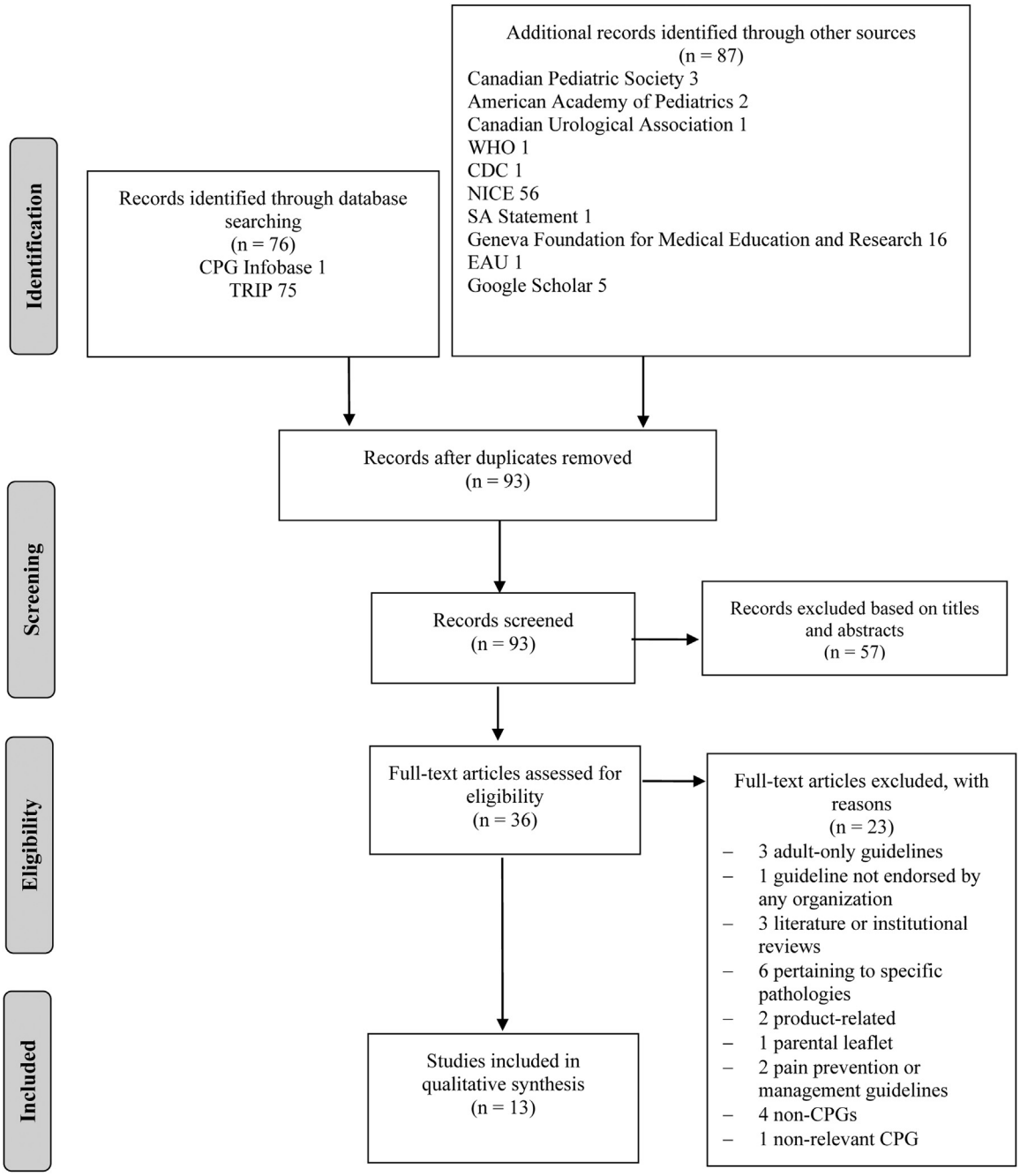

Figure. PRISMA flow diagram. *EAU*, European Association of Urology; *NICE*, National Institute for Health and Care Excellence; *TRIP*, Turning Research into Practice; *WHO*, World Health Organization; *SA Statement*, South African Statement

Table IV. Summary of recommendations from the top 3 CPGs

Key recommendations	AAP	CDC	CUA
Objectives	To review current evidence on male circumcision to update the AAP statement on circumcision of the newborn penis (last issued in 1999) and provide guidance to AAP members	To assist US healthcare providers in information sharing and decision making regarding male circumcision in relation to HIV infections, sexually transmitted infections, and other health outcomes	To recount the current evidence on the benefits of circumcision, optimal anesthesia/analgesia requirements for neonatal circumcision, possible complications of circumcision, and its effect on sexual function and sensation, as well as the care of a normal foreskin in early childhood
Parent/patient decision making	Parents are entitled to factually correct, nonbiased information about circumcision that should be provided before conception and early in pregnancy, when parents are most likely to be weighing the option of circumcision of a male child. Physicians counseling families about elective male circumcision should assist parents by explaining, in a nonbiased manner, the potential benefits and risks and by ensuring that they understand the elective nature of the procedure. Parents should weigh the health benefits and risks in light of their own religious, cultural, and personal preferences, as the medical benefits alone might not outweigh these other considerations for individual families. Parents of newborn boys should be instructed in care of the penis at the time of discharge from the newborn hospital stay, regardless of whether or not the newborn has been circumcised.	1. Consideration of factors associated with decision making Health benefits and risks of elective neonatal, adolescent, or adult medically performed male circumcision should be considered in consultation with medical providers while taking into account factors associated with decision making around male circumcision, including religion, societal norms and social customs, hygiene, aesthetic preference, and ethical considerations. 4. Providing information to parents of male newborns, children, or adolescents Health benefits and risks of elective neonatal, pediatric, or adolescent male circumcision should be considered in consultation with medical providers. Ideally, discussions about neonatal circumcision should occur prior to the birth of the child. Ultimately, whether to circumcise a male neonate or child is a decision made by parents or guardians on behalf of their newborn son or dependent child. When providing information to parents about male circumcision for an adolescent minor, the adolescent should be included in the decision making process about undergoing elective male circumcision. When providing information to an adolescent inquiring about male circumcision, parents should be engaged in the discussion, unless the adolescent is legally emancipated. Minors may be deemed emancipated, giving them sole authority to make health care decisions on their own behalf under certain circumstances, which vary by state law; for example, if the minor (1) lives independently and is self-supporting, (2) is married, (3) is pregnant or a parent, (4) is in the military, or (5) is declared emancipated by a court as defined in the Mature Minor section. 4A. Parents and guardians should be informed about the medical benefits and risks of neonatal, pediatric, or adolescent medically performed male circumcision	
Phimosis			1. Neonatal examination of the foreskin and urethral meatus should be part of routine clinical assessment of all newborn boys. Continued examination of the foreskin without forcible retraction is recommended during yearly physical examinations to rule out pathologic phimosis and document natural preputial retraction (Level 5, Grade D). 2. Persistent physiologic phimosis in an asymptomatic child should not be an indication for circumcision (Level 5, Grade D). 3. Physiologic phimosis requires treatment if associated with true balanoposthitis or recurrent UTIs (Level 5, Grade D). 4. Topical steroids are the first-line treatment for persistent physiologic phimosis requiring treatment with good success rates and low risk of complications (Level 1b/2b, Grade A).

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Table IV. Continued

Key recommendations	AAP	CDC	CUA
			5. A moderately low-potency steroid (eg, triamcinolone, clobetasone, hydrocortisone, mometasone) may have similar success compared with a highly potent steroid (betamethasone) (Level 2b, Grade B). 6. Patient selection to ensure compliance, demonstrating the technique of gentle retraction of the foreskin, and continued retraction after initial success is important to achieve continued success to topical steroid therapy (Level 5 Grade D). 7. Recurrence of physiologic phimosis is common and normally responds to another course of topical steroids (Level 2b/3 Grade C).
UTI			1. Neonatal circumcision decreases the risk of UTI (Level 2a). 2. The risk of UTI is low in infant males and decreases further beyond infancy (Level 2b–4). 3. There is paucity of Level 1 evidence to justify recommending universal circumcision to prevent UTIs in normal males. 4. A stronger effect of neonatal circumcision in preventing UTIs in boys with urologic abnormalities has been demonstrated and, therefore, it is recommended that a discussion with the parents is advisable for this subgroup of neonates (Level 3–4, Grade C).
Sexually transmitted infections	Evaluation of the current evidence indicates that the health benefits of newborn male circumcision outweigh the risks, and the benefits of newborn male circumcision justify access to this procedure for those families who choose it.	2. Providing information to sexually active adolescent and adult males regardless of circumcision status All sexually active adolescent and adult males should consider using other proven HIV and STI risk-reduction strategies, such as reducing the number of partners, correct and consistent use of male latex condoms, and HIV preexposure or postexposure prophylaxis. 3. Providing information to uncircumcised sexually active adolescent and adult males Prior to sharing information about medically performed male circumcision, uncircumcised sexually active adolescent and adult males should be assessed to determine their HIV risk behaviors, HIV infection status, and the gender of their sexual partner(s).[16] The results of these assessments will inform the discussion with men about the risks and benefits of medically performed male circumcision. 3A. Providing information to uncircumcised adolescent and adult males who are heterosexually and bisexually active (ie, men who have sex with women) 3A-1. An assessment of the patient's risk of acquiring HIV through heterosexual sex should be conducted: -Providers should review the patient's HIV risk behavior.[17,18] -Providers should assess condom use practices, consistency of use, and barriers to use. -Providers should inform heterosexually and bisexually active adolescent and adult males that males at high risk of HIV exposure during heterosexual sex include HIV-uninfected males in sexual relationships with: •An HIV-infected woman (ie, in an HIV-discordant couple) •One or more females who are at high risk for HIV (ie, commercial sex workers, females who inject drugs, and females in defined geographic locations with a prevalence of HIV >1.0%)	STIs: 1. Female-to-male transmission: There is compelling evidence that male circumcision reduces the risk of HIV transmission from female partners to male (Level 1 a, Grade A). The magnitude of the effect is debatable and cannot be extrapolated to Canada from the African RCTs. 2. Male-to-male transmission: Based on current evidence, male circumcision does not provide protection for MSM (Level 2a). 3. Women partners: Based on current evidence, male circumcision is not protective for female partners (Level 2a–b). 4. Based on current evidence, universal neonatal circumcision cannot be recommended to prevent HIV infection (Grade B). HPV: 1. HPV prevalence in men: Current evidence suggests a modest decrease in HPV prevalence in the glans and coronal sulcus up to 2 years following male circumcision (Level1b). The protective effect is partial, does not cover all high-risk types, and is weaker further away from the glans and coronal sulcus. It is not clear whether this effect will persist into adulthood following neonatal circumcision. 2. HPV clearance in men: There is no evidence (except a single RCT on HIV-negative men) that male circumcision increases HPV clearance (Level 1b–2b). If it did increase clearance, this may also inflate the impact of the prevalence benefits mentioned.

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Table IV. Continued

Key recommendations	AAP	CDC	CUA
		•Multiple female partners. 3A-2. Regardless of their assessed risks as assessed in 3A-1, all uncircumcised adolescent and adult males who engage in heterosexual sex should be informed about the significant, but partial, efficacy of male circumcision in reducing the risk of acquiring HIV and some STIs through heterosexual sex, as well as the potential harms of male circumcision. -Men and male adolescents being provided information about male circumcision should be told that (see Box 1): -Male circumcision reduces, but does not eliminate, the risk of acquiring HIV and some STIs during penile-vaginal sex. In clinical trials, medically performed male circumcision reduced the incidence of genital ulcer disease (GUD) by 48% and the prevalence by 47%, and reduced the prevalence of HR-HPV by 23%–47% among circumcised men. -Male circumcision has not been shown to reduce the risk of HIV during receptive anal sex. -Male circumcision has not been shown to reduce the risk of STIs during anal sex. -The effect of male circumcision on reducing the risk of HIV and STI transmission during oral sex has not been evaluated. -Male circumcision has not been shown to reduce the risk of HIV transmission to female partners. However, in clinical trials, medically performed male circumcision reduced the prevalence of GUD by 22%, HR-HPV by 22%, *T vaginalis* by 45%, and bacterial vaginosis by 40% among female partners. -Male circumcision has been shown to reduce the risk of UTIs in males aged 0-1 years by 90%, in males aged 1-16 years by 85%, and in males >16 years by 71%. -During adulthood, uncircumcised males are more likely than circumcised males to experience invasive penile cancer. -After circumcision, men should not have sex until their health care provider has documented wound healing. 3A-3. Uncircumcised, HIV-uninfected men and male adolescents at increased risk for HIV acquisition through heterosexual sex should be provided information about the risk and benefits of male circumcision (see Box 1). When a decision is made to undergo male circumcision, a referral for surgical consultation and access to medically performed male circumcision surgical services should be provided 3B. Providing information to MSM (exclusively) Healthcare providers should explain that the data regarding the relationship between male circumcision and the acquisition of HIV and other STIs among MSM have a number of limitations, and results differ based on predominance of insertive or receptive sexual practice. Based on data from heterosexuals, it is biologically plausible that male circumcision could benefit MSM who practice mainly or exclusively insertive anal sex. Pooled data from observational studies of male circumcision among MSM indicated that overall, male circumcision provided partial protection from HIV acquisition for the partner who practiced mainly or exclusively insertive anal sex. However, because clinical trials of male circumcision did not include large enough numbers of MSM, and because many MSM practice both insertive and receptive anal sex, definitive statements cannot be made about whether male circumcision can reduce the risk of acquiring HIV and other STIs. In contrast, male circumcision provides no direct biologically plausible risk-reduction benefit for the receptive anal sex partner, and receptive anal intercourse carries a substantially higher risk for acquisition of HIV than insertive sex.	3. HPV incidence or acquisition in men: There is no convincing evidence to suggest that male circumcision decreases HPV acquisition or incident infections in HIV-positive or -negative men (Level 1b–2b). 4. HPV in female partners: male circumcision lowers prevalence and incidence in partners of HIV-negative men and improves clearance rates (Level 1b–2b). 5. As a public health intervention, it is likely that the effect of HPV vaccination and behavioral modification will be more effective than performing universal neonatal circumcisions on all males (Grade B). Nonulcerative STIs: 1. Currently, there is no significant evidence to support the protective role of male circumcision in the acquisition of nonulcerative STIs, although there may be a protective effect on acquisition of *Trichomonas* infections (Level 2a–b, Grade B). 2. Currently, there is no significant evidence to support the protective role of male circumcision for males and females in the acquisition of ulcerative STIs (Level 2–4, Grade C). 3. There is weak evidence of a partial protective effect of male circumcision against HSV-2 infections in adult men following male circumcision (Level 2a–b).

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Table IV. Continued

Key recommendations	AAP	CDC	CUA
		3B-1. MSM should be informed that: -Male circumcision reduces the risk of men acquiring HIV and other STIs during penile-vaginal sex, but no definitive statements can be made about whether male circumcision reduces the risk of MSM acquiring HIV and other STIs during penile-anal sex. -Results from data pooled across several observational studies indicate that among MSM who practice mainly or exclusively insertive anal sex, circumcision was associated with a decreased risk of acquiring a new HIV infection for the insertive partner; however, clinical trials have not included the numbers of MSM necessary to make a definitive conclusion. -It is biologically plausible that MSM who practice mainly insertive anal sex may experience a reduction in the risk for acquiring HIV and STIs like that among heterosexuals in clinical trials during penile-vaginal sex; among men who practice mainly or exclusively receptive-anal sex, male circumcision does not provide a biologically plausible benefit for a similar reduction in risk.	
Penile and prostate cancer			Penile cancer: 1. Circumcision decreases the risk of penile cancer (Level 2-3). 2. However, given the low incidence of invasive penile cancer, the partial protective effect of male circumcision, and the availability of other preventive strategies, such as HPV vaccination, condom use, and smoking cessation programs, it is difficult to justify universal neonatal circumcision as a preventive strategy for preventing penile cancer (Grade B). 3. Recognition and treatment of phimosis during regular health visits is recommended to decrease the risk of penile cancer (Level 5, Grade D). A genitourinary exam during puberty is recommended to ensure preputial retractability and hygiene, rule out phimosis, and counsel regarding HPV vaccination and safe sexual practices, as well as to offer the possibility of circumcision as a preventive measure against STIs while specifying the drawbacks and efficacy of other preventive measures (Grade D). Prostate cancer: 1. There is no convincing evidence on the protective effect of male circumcision against prostate cancer (Level 3–4, Grade B)
Analgesia and anesthesia	Trained and competent practitioners, using sterile techniques and effective pain management, should perform male circumcision. Analgesia is safe and effective in reducing the procedural pain associated with newborn circumcision; thus, adequate analgesia should be provided whenever newborn circumcision is performed. Nonpharmacologic techniques (eg, positioning, sucrose pacifiers) alone are insufficient to prevent procedural and	4-B.Medically performed neonatal, pediatric, or adolescent male circumcision should be done by trained clinicians using appropriate (or standard) infection control, analgesia, and anesthetic practices.	1. A dorsal penile nerve block with a ring block, using proper technique, is the most effective technique to provide anesthesia during a neonatal circumcision (Level 1–2, Grade A). 2. Topical local anesthetics alone are inferior to nerve and ring blocks and require an adequate time interval for efficacy; they can be used as an adjunct to penile blocks (Level 1–2, Grade A). 3. Oral sucrose, non-nutritive sucking, music, and other environmental interventions should only be used as an adjunct to these methods (Level 1–3, Grade A).

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Table IV. Continued

Key recommendations	AAP	CDC	CUA
	postprocedural pain and are not recommended as the sole method of analgesia. They should be used only as analgesic adjuncts to improve infant comfort during circumcision. If used, topical creams may cause a higher incidence of skin irritation in low birth weight infants compared with infants of normal weight, so penile nerve block techniques should be chosen for this group of newborns.		
Complications	Elective circumcision should be performed only if the infant's condition is stable and healthy. Male circumcision should be performed by trained and competent practitioners, using sterile techniques and effective pain management.		1. Complication rates post-neonatal circumcision are usually low (around 2%), but given the variability in quoted complication rates and risk of delayed complications not treated by the original physician performing the neonatal circumcision, it is likely that the overall complication rate is slightly higher (Level 2–4). 2. Operator experience and training, recognition of contraindications to circumcision, technique used, age, and patient-related variables can impact results, and proper reporting and auditing of results is recommended (Level 4, Grade D).
Workforce development	Key professional organizations (AAP, AAFP, ACOG, American Society of Anesthesiologists, American College of Nurse Midwives, and other midlevel clinicians, such as nurse practitioners) should work collaboratively to: -Develop standards of trainee proficiency in performance of anesthetic and procedure techniques, including suturing -Teach the procedure and analgesic techniques during postgraduate training programs -Develop educational materials for clinicians to enhance practitioners' competency in discussing the benefits and risks of circumcision with parents -Offer educational materials to assist parents of male infants with the care of both circumcised and uncircumcised penises.		

GUD, genital ulcer disease; *HR-HPV*, high-risk human papillomavirus; *HSV-2*, herpes simplex virus; *RCT*, randomized controlled trial.