

Evidence-based answers from the  
Family Physicians Inquiries Network

## CLINICAL INQUIRIES



# Q/ What's the best way to control circumcision pain in newborns?

## EVIDENCE-BASED ANSWER

**A/ DORSAL PENILE NERVE BLOCK** (DPNB), ring block (RB), and eutectic mixture of local anesthetics (EMLA) all control pain effectively during neonatal circumcision (strength of recommendation [SOR]: **A**, systematic review). An RB may provide superior pain relief to DPNB and EMLA (SOR: **B**, limited-quality

evidence).

Using a Mogen clamp reduces pain by shortening procedure time (SOR: **A**, randomized controlled trials [RCTs]). Effective adjuncts to pain relief include non-nutritive sucking (NNS; a pacifier without sucrose), a sucrose pacifier, and use of a padded chair (SOR: **A**, RCTs).

### Evidence summary

Outcome assessment of neonatal pain response includes heart rate, crying time, procedure length, and behavioral distress scores. A Cochrane systematic review of 35 RCTs with a total of 1997 newborns evaluated DPNB, RB, and EMLA for pain relief during circumcision.<sup>1</sup> All 3 methods were more effective than placebo or no treatment. Studies of DPNB reported lowered heart rates and shorter crying times than studies with EMLA vs placebo and RB vs placebo (TABLE).

This review included 2 RCTs that compared DPNB with EMLA in 133 newborns. Infants who received DPNB had significantly lower heart rates (−17 bpm; 95% confidence interval [CI], −23 to −11).<sup>1</sup> The review concluded that DPNB is the most effective method of anesthesia during circumcision. Comparison of effect sizes between studies may be inaccurate because of different study conditions, however.

### Direct comparison ranks RB first, DPNB second, EMLA third

The only head-to-head comparison of DPNB, RB, EMLA, and placebo is an RCT of 52 neonates, which found that RB resulted in the shortest mean crying time during painful procedures and the lowest increase from baseline in mean heart rate during foreskin separation.

DPNB was the next most effective anesthetic; EMLA, although superior to placebo, was the least effective.<sup>2</sup>

### Mogen clamp shortens procedure (and pain) more than other clamps

Three small RCTs evaluated procedure time using different types of instruments for circumcision.<sup>3-5</sup> Two RCTs, in 57 and 48 newborns, compared the Mogen clamp with the Gomco clamp. The procedure time for the Mogen clamp was 1.9 times shorter than for the Gomco clamp in the first study ( $7.2 \pm 0.32$  vs  $13.9 \pm 0.32$  min;  $P=.0001$ ) and 2.5 times shorter in the second study ( $1.35 \pm 0.32$  vs  $3.48 \pm 1$  min), thereby decreasing duration of pain.<sup>3,4</sup> One of the RCTs found a significantly smaller heart rate increase from baseline for the Mogen clamp (8%) than the Gomco clamp (24%).<sup>4</sup>

In an RCT of 59 newborns, procedure time was significantly shorter with the Mogen clamp ( $12 \pm 0.9$  min) vs the PlastiBell circumcision device ( $20 \pm 1.7$  min).<sup>5</sup>

### Useful adjuncts:

#### A pacifier and a comfy chair

Effective adjuncts to DPNB include NNS, a sucrose pacifier, and use of a padded chair.<sup>6,7</sup> An RCT of 44 newborns given a DPNB found that adjunctive NNS reduced crying time to

Rachel A. Shockley, DO  
Community Health Network  
Family Medicine Residency,  
Indianapolis, Ind

Katherine Rickett,  
MSLS, MEd  
East Carolina University,  
Greenville, NC

ASSISTANT EDITOR  
Anne L. Mounsey, MD  
University of North Carolina,  
Chapel Hill



**Dorsal penile nerve block, ring block, and EMLA all control pain effectively during circumcision in newborns; ring block may work best.**

TABLE

## Comparative outcomes for circumcision anesthesia

Type of anesthesia	Decrease in heart rate (bpm) vs placebo <sup>1</sup>	Decrease in crying time (%) vs placebo <sup>1</sup>	Mean proportion of time crying during foreskin separation (SD) <sup>2</sup>	Mean proportion of time crying during clamping (SD) <sup>2</sup>	Mean heart rate change (bpm) from baseline during separation (SD) <sup>2</sup>
DPNB	-35 (95% CI, -41 to -30) N=592	-54% (95% CI, -64 to -44) N=592	0.65 (0.33) N=14	0.41 (0.35) N=14	30.9 (32.6) N=14
RB	-29 (95% CI, -52 to -7) N=12	-26.3% (95% CI, -38 to -15) N=65	0.54 (0.38) N=12	0.37 (0.24) N=12	20.2 (32.1) N=12
EMLA	-15 (95% CI, -19 to -10) N=200	-15.2% (95% CI, -21 to -9.3) N=200	0.82 (0.17) N=15	0.55 (0.32) N=15	41.4 (31.4) N=15
Placebo	NA	NA	0.98 (0.05) N=11	0.85 (0.21) N=11	53.0 (46.2) N=11

bpm, beats per minute; CI, confidence interval; DPNB, dorsal penile nerve block; EMLA, eutectic mixture of local anesthetics; NA, not applicable; RB, ring block; SD, standard deviation.

4.2 ± 2.6 min compared with a control time of 6.3 ± 2.35 min.<sup>6</sup>

Another RCT of 80 infants, all given a DPNB, found significantly lower behavioral distress scores (on a 3-point scale, with 3 being a sustained cry) among infants using a sucrose pacifier (0.45; standard deviation [SD]=0.80; *P*=.002) and padded chair (0.49; SD=0.52; *P*=.007) compared with controls (1.12; SD=0.48; *P*<.001).<sup>7</sup>

### Recommendations

The American Academy of Pediatrics recommends analgesia during circumcision because sufficient evidence exists that the procedure causes pain. EMLA cream, DPNB, and RB are all options; RB may provide the most effective analgesia. A sucrose pacifier and a padded chair may be effective adjuncts.<sup>8</sup>

JFP

### References

1. Brady-Fryer B, Wiebe N, Lander JA. Pain relief for neonatal circumcision. *Cochrane Database Syst Rev*. 2004;(4):CD004217.
2. Lander J, Brady-Fryer B, Metcalfe JB, et al. Comparison of ring block, dorsal penile nerve block, and topical anesthesia for neonatal circumcision: a randomized controlled trial. *JAMA*. 1997;278:2157-2162.
3. Kaufman GE, Cimo S, Miller LW, et al. An evaluation of the effects of sucrose on neonatal pain with 2 commonly used circumcision methods. *Am J Obstet Gynecol*. 2002;186:564-568.
4. Kurtis PS, DeSilva HN, Bernstein BA, et al. A comparison of the Mogen and Gomco clamps in combination with dorsal penile nerve block in minimizing the pain of neonatal circumcision. *Pediatrics*. 1999;103:E23.
5. Tausch HW, Martinez AM, Partridge JC, et al. Pain during Mogen or PlastiBell circumcision. *J Perinatol*. 2002;22:214-218.
6. South MM, Strauss RA, South AP, et al. The use of non-nutritive sucking to decrease the physiologic pain response during neonatal circumcision: a randomized controlled trial. *Am J Obstet Gynecol*. 2005;193:537-542.
7. Stang HJ, Snellman LW, Condon LM, et al. Beyond dorsal penile nerve block: a more humane circumcision. *Pediatrics*. 1997;100:E3.
8. American Academy of Pediatrics Task Force on Circumcision. Circumcision policy statement. *Pediatrics*. 1999;103:686-693.