



circumcision

a lifetime of medical benefits



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PREVENTION OF URINARY TRACT INFECTION (UTI):

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Uncircumcised boys are about 10 times as likely to get serious kidney infections in the first year of life as are circumcised infants; even in adults circumcision protects against UTIs. These kidney infections are most dangerous in the first 3 months, during which time they often lead to hospitalization and can result in overwhelming blood infection and other serious infections. Kidney scarring has been shown to occur later. There is concern that future kidney failure and high blood pressure may follow infantile UTIs. Abnormal kidney function and hormonal secretion can occur with infant UTIs. Fecal contamination of the moist inner foreskin layer with bacterial attachment leads to these kidney infections.



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Bacteria and the Foreskin

- ↑ Bacterial colonization in uncircumcised infants (Wiswell J Peds 1988, Glennon Arch Dis Child 1988 Bullgren Acta Ped Scand 1976).
- ↑ Uropathic bacterial adherence to foreskin mucosa (Fussell J Urol 1988, Roberts J Urol 1984).
- ↑ Bacteriuria in uncircumcised boys (Amir AJDC 1993, Schlager Arch Pediatr 1995).

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GINSBERG & McCracken - PEDIATRICS 69:409. 1982 (APR)

UTI's in young infants --100 infants less than 9 months=62% boys, less than 3 months - 75% boys, about 20% sepsis. 95% of UTI boys uncircumcised

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Neonatal Pyelonephritis (first three months of life)

Roberts, JA: Contemporary Peds 1988; 5:42-54

Author	% Patients Male	% Uncircumcised
Ginsberg-McCracken (1982)	75	95
Wiswell et al (1985)	68	86

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Increased Risk of UTI's in Uncircumcised Infants (<1yr)

(Wiswell. J Urol 1992; 148: 739)

Meta analysis of 9 studies

Uncircumcised		Circumcised	
UTI's	Total Population	UTI's	Total Population
893 (1.4%)	64,689	302 (0.12%)	255,468

Combined odds ratio 11.8 (range 5-89)

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Herzog LW: Am J Dis Child 1989; 143:348-350

BOSTON CHILDREN'S HOSPITAL OUTPATIENT CLINIC

Male infants below age 1 year having urine culture (catheterization or suprapubic tap) as work-up for acute febrile illness:

36 UTIs
76 control

All cases with UTIs were uncircumcised vs 32% of control (p < .0001).

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Renal Damage 1 Year After First UTI; DMSA Scintigraphy

(Stokland et al, J Pediatr 1996; 129:815)

- 157 children (median age 0.4 yrs) - 72 girls, 84 boys
- After 1 year, 38% had DMSA evidence of renal damage; of these, 47% had reflux
- Risk factors for renal damage - high fever, positive CRP, and reflux

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Circumcision and UTI's in Preschool Boys (Australia)

(Craig, J Pediatrics 1996; 128: 23)

144 boys < age 5 years with UTI's
742 controls -
1.4% of UTI boys circumcised
6.3% of controls
Odds ratio 4.8

Conclusion: Circumcision decreases the risk of symptomatic UTI in preschool boys; independent of age.

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Uncircumcised Young Men Have Increased Risk of UTI

Spach et al, JAMA 1992; 267:679

- 20 men (median age 30) bacteriuric UTI
- 52 men (median age 32) nonbacteriuric symptoms
- 31% of bacteriuric men uncircumcised
- 12% of nonbacteriuric men uncircumcised (p. 0.04)

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Urinary Tract Infections (UTIs) ≤ Age 1 Year Kaiser Permanente Northern California (KP) Schoen, Pediatrics 2000;105:789-93

- 1996 KP Membership 2.7 Million
- 1996 Deliveries 28,812
- Males 14,893
- Males Circumcised 9,668 (64.9%)
[Inpatient 63.1%, Outpatient 1.8%]

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Hospitalization for UTIs ≤ Age 1 Year Schoen, Pediatrics 2000;105:789-93

	All Males			Females
	Uncirc	Circ		
# Hosp	42	38	4	22
# UTIs	154	132	22	292
% Hosp	27.2%	28.8%	18.2%	7.5%
Mean Age - Hosp	---	2.5 mos	4.5 mos	6.5 mos

Odds Ratio for UTI Hosp (U/C) 18:1.

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Circumcision and UTIs ≤ Age 1 Year Male UTIs Schoen, Pediatrics 2000;105:789-93

	#	Births	Prevalence
UTI Circ	22	9668	1:440 (0.23%)
UTI Uncirc	132	5225	1:40 (2.52%)
Total UTIs	154	14,893	1:97 (1.03%)

Odds Ratio for UTI (U/C) 11:1.

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Complications of Newborn Circumcision (NC) ≤ Age 1 Year Schoen, Pediatrics 2000;105:789-93

- No hospitalizations for NC complications.
- No direct NC complication outpatient data -- not included in 70 diagnoses coded on OSCR form (UTI, UA, and urine collection method are coded).
- No difference in total outpatient visits for circumcised and uncircumcised boys in 1st 6 months (9.2 for each -- pediatric, emergency, and specialty visits).

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UTIs and Circumcision ≤ Age 1 Year Summary and Conclusions Schoen, Pediatrics 2000;105:789-93

- Newborn circumcision (NC) results in an 11-fold decrease in UTI prevalence in 1st year.
- NC results in an 18-fold decrease in UTI hospitalizations in 1st year.
- UTI costs are 10 times higher in uncircumcised boys in 1st year.

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Possible Reasons for UTI in Uncircumcised Male Infants

- Physiologic adherence of foreskin to glans (undifferentiated foreskin) during first year with inability to retract and cleanse
- Binding of fimbriated E. Coli from stool to inner mucous layer of foreskin with ascending infection (Roberts, Scandinavian Studies)
- ? Role of efficient plastic diapers on promoting stool contact with foreskin

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Syndrome of Disturbed Hormonal and Renal Tubular Function (Salt Wasting) with Pyelonephritis in Young Infants

- Males predominate - none known to be circumcised
- Most prevalent < age 3 months
- Hyponatremia, hyperkalemia, FTT
- Markedly elevated plasma aldosterone
- Reverses on treatment of UTI
- Question: Potential long-term consequences - ? hypertension, ? future renal failure

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Is Infant UTI a New & Growing Disease?

1. Previously underdiagnosed - "silent disease."
2. Reluctance to catheterize baby boy.
(not necessary if circumcised)
3. Are super-absorbent diapers partly to blame?
Analogy to "toxic shock"/tampon connection

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