# Evidence Update

Maternal Health Series

April 2004

### How does vacuum extraction compare to forceps delivery?

Vacuum extraction results in less maternal trauma, but cephalohaematoma in the baby is more frequent.

#### **Inclusion criteria**

#### Studies:

Randomized and quasi-randomized controlled trials.

#### **Participants:**

Women of all parties requiring assisted delivery.

#### Intervention:

Vacuum extraction versus forceps delivery.

#### **Outcome measures:**

Fetal outcomes; maternal injury to the perineum; maternal perception of short and long-term pain.

#### Results

- Ten trials included of variable quality (n = 2923).
- Vacuum extraction was associated with an increased number of women with failed delivery in some studies, but not in others.
- Vaccuum extraction was less likely to cause significant maternal injury than forceps (RR 0.46, 95%Cl 0.38 to 0.56), and was associated with less use of regional or general anaesthesia, and fewer women experiencing severe pain at 24 hours (0.57 95% Cl 0.34 to 0.94).
- Vaccuum extraction was associated with more infants with cephalhaematoma (RR 2.34 95%Cl 1.64 to 3.35) and retinal haemorrage (RR 1.46, 95%Cl 1.17 to 1.83). Serious neonatal injury was uncommon with either instrument.
- Vacuum extraction was associated with more maternal worries about the baby.
- No differences were detected between Apgar score at 1 minute, 5 minutes or perinatal deaths.





Adapted from Johanson RB, Menon V. Vacuum extraction versus forceps for assisted vaginal delivery (Cochrane Review). In: The Cochrane Library, Issue 1, 2004. Chichester, UK: John Wiley & Sons, Ltd.

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## Review: Vacuum extraction versus forceps for assisted vaginal delivery Comparison: 01 VACUUM EXTRACTION VS FORCEPS DELIVERY Outcome: 04 Significant maternal injury

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% Cl
Bofill 1996	38/322	95/315		36.2	0.39 [ 0.28, 0.55 ]
Dell 1985	21/73	22/45		10.2	0.59 [ 0.37, 0.94 ]
Keele 1993	32/296	52/311		19.1	0.65 [ 0.43, 0.97 ]
Lasbrey 1964	2/121	10/131	<b></b>	3.6	0.22 [ 0.05, 0.97 ]
Portsmouth 1983	14/152	34/152		12.8	0.41 [ 0.23, 0.74 ]
Salamalekis 1995	12/200	22/200		8.3	0.55 [ 0.28, 1.07 ]
Stoke/Wigan	8/132	26/132		9.8	0.31 [ 0.14, 0.65 ]
Fotal (95% CI) Fest for heterogeneity chi-squ	127 / 1296 Jare=6.99 df=6 p=0.3	261 / 1286 217	•	100.0	0.46 [ 0.38, 0.56 ]

 Review:
 Vacuum extraction versus forceps for assisted vaginal delivery

 Comparison:
 01 VACUUM EXTRACTION VS FORCEPS DELIVERY

 Outcome:
 07 Severe perineal pain at 24 hours

Study	Treatment n/N	Control n/N		Relative Risk (Fixed) 95% Cl		Weight (%)	Relative Risk (Fixed) 95% Cl
Keele 1993	14/140	19/146				50.2	0.77 [ 0.40, 1.47 ]
Stoke/Wigan	7/107	18/102	-			49.8	0.37 [ 0.16, 0.85 ]
Total (95% CI) Test for heterogeneity chi-squ Test for overall effect=-2.18 p	21 / 247 are=1.84 df =1 p=0.13 =0.03	37 / 248 747		-		100.0	0.57 [ 0.34, 0.94 ]
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Review: Vacuum extraction versus forceps for assisted vaginal delivery Comparison: 01 VACUUM EXTRACTION VS FORCEPS DELIVERY Outcome: 10 Cephalhaematoma

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% Cl
Bofill 1996	37/322	19/315		47.5	1.91 [ 1.12, 3.24 ]
Dell 1985	11/73	1/45	- 11 PA	- 3.1	6.78 [ 0.91, 50.77 ]
Fall 1986	7/20	2/16		5.5	2.80 [ 0.67, 11.67 ]
Keele 1993	27/296	8/311		19.3	3.55 [ 1.64, 7.68 ]
Portsmouth 1983	14/152	8/152		19.8	1.75 [ 0.76, 4.05 ]
Stoke/Wigan	2/132	2/132		4.9	1.00 [ 0.14, 6.99 ]
Total (95% CI) Test for heterogeneity chi-squ Test for overall effect=4.67 p	98 / 995 Jare=4.02 df=5 p=0.54 <0.00001	40 / 971 464	•	100.0	2.34 [ 1.64, 3.35 ]

#### **Reviewer's conclusions**

#### **Implications for practice:**

Use of the vacuum extractor reduces significant maternal injuries. Maternal and neonatal injury may be increased when a vacuum extraction failure is followed by an attempt to deliver with forceps. Vacuum extraction is associated with cephalohaematoma.

#### Implications for research:

It remains to be shown which instrument results in fewer major adverse neonatal effects: the increase in retinal haemorrhages and trend to low 5-minute Apgar scores in the vacuum should be investigated further. Research examining which mothers are at particular risk of trauma, and which babies are at risk of cranial injuries would be valuable.

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