

## Overview of literature on immediate versus delayed cord clamping in full term infants

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Author	Year	Type of study	Country	Participants	Cord Management	Main findings
Andersson et al	2011	RCT	Sweden	400	EC: ≤ 10 s  DC: ≤ 3 mins  (Both groups held 20cms below level of introitus, and delay of skin-to-skin contact for 30secs was equal between groups)	DC (compared with EC) resulted in improved iron status and reduced prevalence of iron deficiency at 4 months of age, and reduced prevalence of neonatal anaemia, without demonstrable adverse effects. As iron deficiency in infants even without anaemia has been associated with impaired development, DC seems to benefit full term infants even in regions with a relatively low prevalence of iron deficiency anaemia.
McDonald	2008	Cochrane Systematic review	Various	11 trials 2989	Various	DC appears to be beneficial long term but the increased risk of jaundice requires facilities with phototherapy readily available <a href="#">1</a> (access review and responses critical of findings of jaundice <a href="#">here</a> , go to p84)
Weckert	2008	Literature review	Various		Various	DC is beneficial especially for Aboriginal babies <a href="#">1</a>
Jahazi	2008	RCT	Iran	64		DC did not increase haematocrit or polycythaemia <a href="#">1</a>
Hutton	2007	Systematic review and Meta-analysis	Various	15 trials 1912		DC is beneficial long term to newborns, increase in polycythemia was observed but considered benign <a href="#">1</a>
Mercer	2007	Literature review	Various	4 trials 838		DC protects newborns from anaemia without harmful effects <a href="#">1</a>
Cernadas	2006	RCT	Argentina	276	EC: within 15 s  IC: at 1 min  DC: 3 mins	DC increased haematocrit within normal range and reduced the rate of neonatal anaemia with no significant difference in bilirubin levels <a href="#">1</a>
Chaparro	2006	RCT	Mexico	476	EC: at 10 s  DC: at 2 mins	DC increased iron stores at 6 months <a href="#">1</a>
Van Rheenen & Brabin	2004	Systematic review	Various		Various	DC in term infants increases haemoglobin at 2 to 3 months of age and reduces risk of anaemia without increasing perinatal complications <a href="#">2</a>
Emhamed et al	2004	RCT	Libya	102	EC: immediate  DC: after cord stopped pulsating (oxytocic after clamping)	DC infants had significantly higher haematocrit and haemoglobin. Three DC infants had polycythemia with no symptoms; two EC infants needed phototherapy <a href="#">2</a>
Gupta & Ramji	2002	RCT	India	102	EC: immediate  DC: when placenta descended into vagina	Infants in EC group had lower birthweight: anaemia at 3 months was 7.7 times higher. DC group had higher serum ferritin levels <a href="#">2</a>
Mercer	2001	Literature review	Various	9 trials 531	Various	DC showed less anaemia at 2 months without symptoms of polycythaemia or significant hyperbilirubinaemia <a href="#">1</a>

Author	Year	Type of study	Country	Participants	Cord Management	Main findings
Grajeda et al	1997	RCT	Guatemala	69	EC: immediate  DC: at end of pulsations; infant level of placenta  DC: after pulsations; infant held below introitus	Recommends delay in clamping as feasible, low cost intervention that can reduce anaemia in developing countries. No differences in polycythemia or jaundice. No difference in DC groups between infant held level or below placenta <b>2</b>
Geethanath et al	1997	RCT	India	107	EC: immediate  DC: after placenta in vagina, infant lowered <10 cm	Mean ferritin higher in DC group (but did not reach significance level) <b>2</b>
Nelle et al	1996	Controlled study		30	EC: < 10 s  DC: > 3 mins, infant on maternal abdomen	In DC group, haematocrits were higher with more pronounced pulmonary vasodilation in first 5 days <b>2</b>
Nelle et al	1995	Controlled study		30	EC: < 10 s  DC: > 3 mins, infant on maternal abdomen	In DC group, blood volume 32% higher. Authors state EC deprives infants of placental transfusions and increases risk of hypovolemia and anaemia <b>2</b>
Nelle et al	1993	Controlled study		30	EC: < 10 s  DC: > 3 mins, infant on maternal abdomen (Leboyer method)	Residual placental blood volume higher in EC infants. For 3kg infant EC = 135ml in placenta, 210ml in baby DC= 75ml in placenta, 270ml in baby <b>2</b>
Linderkamp et al	1992	Controlled study		30	EC: < 10 s  DC: at 3 mins, infant held at introitus	Increased residual placental blood volume with EC. DC results in increased haematocrit, blood viscosity at 2 hr 40% higher, elevated bilirubin. No infants develop clinical symptoms <b>2</b>
Oxford Midwives Group	1991	RCT	UK	554	EC: stat or ≤ 1 min  DC: after 3 mins or when pulsations stopped, infant on maternal abdomen	DC showed increase in jaundice but not statistically significant, showed no clear benefit for EC. Higher rates of continued breastfeeding at 10-12days in DC group <b>1</b>
Kliot & Silverstein	1984	Controlled study		79	EC: < 60 s and on maternal abdomen  DC: >10 min and on maternal abdomen  Control: EC < 60 s	Validated safety of Leboyer-type birth  No significant difference in temperature, HR, haematocrit, pH, Agar scores or other variables <b>2</b>
Nelson et al	1980	RCT	Canada	54	EC: <10 s DC: after pulsations ceased, infant on maternal abdomen	Found that Leboyer method was not unsafe. Found no differences in polycythemia or jaundice <b>2</b>

1) Tina Lundholm, undergraduate Midwifery student 2010

2) Mercer, J. Skovgaard, R., Erickson-Owens, D. 'Fetal to neonatal transition: first, do no harm', Normal Childbirth: Evidence and Debate. Downe, S (ed) (2008) pp. 171-4

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