**WORKSHEET for Evidence-Based Review of Science for Emergency Cardiac Care**

**Worksheet author(s)**

Rintaro Mori

**Date Submitted for review:**

1st February, 2009

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**Clinical question.**

"In neonates (P), does delayed cord clamping or milking of the cord (I) versus standard management (C), improve outcome (O)?"

**Is this question addressing an intervention/therapy, prognosis or diagnosis?** Intervention

**State if this is a proposed new topic or revision of existing worksheet:** New

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**Conflict of interest specific to this question**

Do any of the authors listed above have conflict of interest disclosures relevant to this worksheet? None

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**Search strategy (including electronic databases searched).**


★ MEDLINE

No. Records Request
1  81  placental transfusion in ti,ab,kw
2  2221  milking in ti,ab,kw
3  55138  clamp* in ti,ab,kw
4  14296  "Ligation"/ all subheadings
5  1141  (ligation in ti,ab,kw) and (xrec=in-process)
6  70348  #3 or #4 or #5
7  21452  explode "Blood-Volume"/ all subheadings
8  245  (blood volume in ti,ab,kw) and (xrec=in-process)
9  61203  explode "Blood-Transfusion"/ all subheadings
10  439  (blood transfusion in ti,ab,kw) and (xrec=in-process)
11  81842  #7 or #8 or #9 or #10
12  462  #6 and #11
13  2747  #1 or #2 or #12
14  387738  explode "Infant-Newborn"/ all subheadings
15  1155  (newborn in ti,ab,kw) and (xrec=in-process)
16  1490  (premature in ti,ab,kw) and (xrec=in-process)
17  352  (low birth weight in ti,ab,kw) and (xrec=in-process)
18  390596  #14 or #15 or #16 or #17
19  122  #13 and #18
20  9984503  tg=humans
21  4120141  tg=animals
22  3107712  #21 not #20
23  122  #19 not #22
24  14249  pt=guideline-
25  17397  pt=meta-analysis
26  11783  pt=practice-guideline
27  247977  pt=randomized-controlled-trial
28  10  #23 and #27
* 29  112  #23 not #28

★ Cochrane

ID Search Hits
#1 (placental transfusion):ti,ab,kw 32
#2 (milking):ti,ab,kw 2957
#3 (clamp*:ti,ab,kw 2323
#4 MeSH descriptor Ligation explode all trees 368
#5 MeSH descriptor Blood Volume explode all trees 837
#6 MeSH descriptor Blood Transfusion explode all trees 2508
#7 (#3 OR #4) 2681
#8 (#5 OR #6) 3246
#9 (#7 AND #8) 55
#10 (#1 OR #2 OR #9) 3040
#11 MeSH descriptor Infant, Newborn explode all trees 9691
#12 (#10 AND #11) 798
#13 (milk):ti,ab,kw 2957
#14 (#12 AND NOT #13) 17

| #5. #3 OR #4 | 416 | 27 Mar 2008 |
| #8. #6 OR #7 | 1,596 | 27 Mar 2008 |
| #9. #5 AND #8 | 29 | 27 Mar 2008 |
| #10. #1 OR #2 OR #9 | 46 | 27 Mar 2008 |
| #11. #10 AND [(cochrane review)/lim OR [controlled clinical trial]/lim OR [meta analysis]/lim OR [randomized controlled trial]/lim OR [systematic review]/lim) | 3 | 27 Mar 2008 |
| #12. #10 NOT #11 | 43 | 27 Mar 2008 |

**AHA**

placental transfusion 40
milking ?
clamping^blood ?
ligation^blood ?
(41+?) references

Updated on 21st August 2009

- **State inclusion and exclusion criteria**
  Any study comparing effectiveness/safety of milking of the cord for neonates are included
  Consensus statement, theoretical model and reviews are excluded except systematic reviews and/or consensus statements by formal consensus methods. Studies already included in included systematic reviews are excluded to avoid repeated inclusion

- **Number of articles/sources meeting criteria for further review:**

  Milking/stripping cord (=M)
  LOE 1 1 Hosono 2007
  LOE 2 4 Colozzi 1954; Siddall 1952; Siddall 1953; Usher 1963;
  LOE 3 1 Walsh 1969
  LOE 4 0
  LOE 5 0
### Summary of evidence

#### Evidence Supporting Clinical Question
**(Studies on milking of the cord)**

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**Level of evidence**

A = Return of spontaneous circulation  
B = Survival of event  
C = Survival to hospital discharge  
D = Intact neurological survival  
E = Other endpoint  
*Italics = Animal studies*

T = Studies on term infants  
P = Studies on preterm infants

#### Evidence Neutral to Clinical Question
**(Studies on milking of the cord)**

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#### Evidence Opposing Clinical Question
**(Studies on milking of the cord)**

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Evidence on effectiveness of cord milking in term deliveries on clinically significant outcomes is weak. The weak evidence showed infants with milked cord are more likely to have higher haemoglobin and higher volume soon after birth, though no clear clinical long-term benefits, as well as risks of it, are shown. There is evidence of benefits from one small randomised controlled trial that showed preterm infants with milked cord are less likely to have transfusions. Evidence is weak to show potential risks of this intervention. There are two multicentre randomised controlled trials being conducted, and the result of them are awaited.

Acknowledgements:
We thank Mr T Swa, Reference Librarian from Osaka University Life Sciences Library, for his contribution to the development of the search strategies and for his through technical advice.

Citation List


Colozzi 1954

LOE 2, fair

Hosono 2007

LOE 1, fair

Siddall 1952

LOE 2, fair

Siddall 1953

LOE 2, fair

Usher 1963

LOE 2, poor

Walsh 1969

LOE 3, poor