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

Worksheet author(s)

<table>
<thead>
<tr>
<th>Szyld, Edgardo</th>
<th>Date Submitted for review:</th>
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<tbody>
<tr>
<td>Atkins Dianne L.</td>
<td>2/13/10</td>
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Clinical question

For newborn infants delivered at greater than or equal to 34+0 weeks gestation (P), is delivery by elective caesarean section under regional anaesthesia (I) in comparison with unassisted vertex vaginal delivery (C) associated with an increased risk of requirement for intubation or CPR during resuscitation (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:

Conflict of interest specific to this question

Do any of the authors listed above have conflict of interest disclosures relevant to this worksheet?
No

Search strategy (including electronic databases searched).

List electronic database:

Medline, Pubmed, Cochrane database, Google Scholar, Embase, Scielo

# 1 - Elective cesarean section and late preterm
Total articles 8 – related articles 2
# 2 - Elective cesarean section and preterm and preterm > 34 weeks and need for neonatal resuscitation
Total articles 1 and related articles 1
# 3 - Elective cesarean section and preterm > 34 weeks and low apgar score
Total articles 5
# 4 - Predictive factors and need for neonatal resuscitation and pregnancy risk factors and preterm
Total articles 1
# 5 - Predictive factors and need for neonatal resuscitation and pregnancy risk factors and preterm babies and cesarean section
Total articles 1
# 6 - Low apgar score and predictive factors and need for neonatal resuscitation and preterm babies
Total articles 1
# 7 - Depression respiratory and late preterm and cesarean section
Total articles 1
# 8 - Elective cesarean section and neonatal respiratory depression and need for neonatal resuscitation
Total articles 1
# 9 - Preterm labor and elective cesarean section and need for resuscitation
Total articles 1
# 10 - Near term and need for neonatal resuscitation
Total articles 10
# 11 - Preterm > 34 weeks and need for neonatal resuscitation
Total articles 1
# 12 - Respiratory depression and bradycardia and birth asphyxia and preterm and risk factor for resuscitation and elective cesarean section
Total articles 1
# 13 - Neonatal respiratory depression and regional anaesthesia
Total articles 83
# 14 - Neonatal respiratory depression and regional anaesthesia and elective cesarean section
Total articles 16
# 15 - Near term and vaginal breech delivery and elective cesarean section
Total articles 1
# 16 - Elective cesarean section AND regional anaesthesia AND unassisted vertex vaginal delivery
Total articles 1
# 17 - Unassisted vertex vaginal delivery and need neonatal resuscitation and pregnancy risk and preterm
Total articles
# 18 - Preterm and regional anesthesia and cesarean section
Total articles 15
Preterm and regional anesthesia and cesarean section
# 19 - Regional anesthesia and elective cesarean section and neonatal outcomes
Total articles 30
# 20 - Regional anesthesia and vaginal delivery and neonatal outcomes
Total articles 22
# 21 - Index for neonatal asphyxia and term and preterm
• **State inclusion and exclusion criteria**

**Inclusion:**

**Types of studies:**
All and not review articles

**Types of participants:**
Newborns, human female and male

**Types of exposures and outcomes:**
Mode of delivery (elective CS, spontaneous or induced initiation of labor)
Maternal risk factors
Reproductive history
Characteristics of the pregnancy, pregnancy complications
Respiratory depression
Asphyxia neonatorum
Need for neonatal resuscitation
Low Apgar score

**Exclusion:**

**Types of study:**
Review articles
Studies involving only stillbirths
Studies involving only babies with congenital malformations

**MESH Terms search:**
Elective cesarean section, preterm babies, risk factors, late preterm, near term, need for neonatal resuscitation, predictive factors, low Apgar score, ante and intra-partum factors, pregnancy risk factors, preterm babies, respiratory depression, preterm labor, CPR, unassisted vertex vaginal delivery, regional anesthesia, general anesthesia, neonatal outcomes, neonatal asphyxia, bradycardia, birth asphyxia.

**Date:**
All included

**Language:**
English – Spanish - French

**Combine:** MESH

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

We’ve conducted a systematic search of electronic libraries in order to find studies answering the question posed by the worksheet. The search strategy was designed including different types of exposures and outcomes and different types of participants - all limited by inclusion and exclusion criteria. After preliminary results, which resulted from combining terms and phrases related to the question, we excluded off-target studies manually. A third stage began when we searched related articles on Pubmed entering quotations by the authors of the articles that I considered most relevant to the worksheet. Finally, we designed a table containing 7 studies - all of them classified by level of evidence- to compare outcomes related to “risk for intubation or CPR”.

**Total of selected articles:** 7

| LOE1  |  
| LOE2  | 5  
| LOE3  |  
| LOE4  | 1  
| LOE5  | 1  

**Level of evidence of therapeutic interventions:**

**LOE1:** Randomized controlled Trials (or meta-analyses of RCTs)
LOE2: Studies using concurrent controls without true randomization (e.g. pseudo-randomized)
LOE3: Studies using retrospective controls
LOE4: Studies without a control group (eg case series)
LOE5: Studies not directly related to the specific patient/population (e.g. different patient/population, animal models, mechanical models etc)

**Summary of evidence**

### Evidence Supporting Clinical Question

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### Evidence Opposing Clinical Question

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**REVIEWER’S FINAL COMMENTS AND ASSESSMENT OF BENEFIT / RISK:**

All selected articles include only term or near term babies. No article was found addressing this question in babies between 34 and 36 weeks. Therefore, all the recommendations emerging from this worksheet refer only to babies with a gestational age of at least 36 weeks.


Need for intubation or CPR in newborn after cesarean section under regional anesthesia, does not seem to be higher than normal vaginal delivery.

**Acknowledgements:** Juan Pablo Berazategui MD, who collaborated with the bibliography search

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**Citation and abstracts:**

**Annibale DJ Hulsey, TC Wagner CL, Southgate WM (1995)**
Comparative neonatal morbidity of abdominal and vaginal deliveries after uncomplicated pregnancies
Arch Pediatr Adolesc Med 1995;149:862-867

**Author's Comment:**
Old study
Level III center
Including >10000 deliveries
Compared with vaginal deliveries
Intubation or CPR 0.11 % in vaginal deliveries and 0% in cesarean section under regional anesthesia.
Confidence interval is not provided
Supports - LOE 2 – Fair

**Atherton N, Parsons SJ, Mansfield P (2006)**
Attendance of paediatricians at elective Caesarean sections performed under regional anaesthesia: Is it warranted?

**Author's Comment:**
Recent study performed In Tasmania
21000 deliveries included in a prospective database
Compared with vaginal deliveries
The intubation rate in normal vaginal deliveries was 0.06 % and 0.08 % with spinal cesarean section and 0.34 % with epidural anesthesia.
Confidence intervals are not provided
Neutral – LOE 2 – Good

Pediatric presence at cesarean section: Justified or not?

**Author's Comment:**
Recent study performed in Australia
44938 deliveries included in a prospective database
Compared with vaginal deliveries
The intubation rate or CPR in normal vaginal deliveries was 0.75 % vs 0.34 % in cesarean sections under regional anesthesia.
Confidence intervals are not provided
### Jacob J, Pfenninger J. (1997)

Cesarean Deliveries: When is a Pediatrician Necessary?  
Obstetricians Gynecologists 1997;89:21  
**Author's Comment:**  
Old study performed in Alaska  
From a prospective database 834 c sections were compared with 834 low risk vaginal deliveries  
The intubation rate or CPR in normal vaginal deliveries was 0 % vs 0 % in repeat cesarean sections under regional anesthesia.  
Confidence intervals are not provided  
**Neutral - LOE 2 - Good**

### Ng P.C Wong MY, Nelson EA. (1995)

Paediatrician attendance at Caesarean section  
**Author's Comment:**  
Study performed in UK  
3525 Deliveries were included  
Not compared to normal vaginal deliveries  
The intubation rate in elective cesarean sections (EPI) was 1 % and in repeat emergency cesarean sections (EPI) 1 %.  
Confidence intervals are not provided  
**Neutral - LOE 4 - Fair**

### Ong BY Cohen MM, Palahniuk RJ. (1989)

Anesthesia for Cesarean Section-Effects on Neonates  
**Author's Comment:**  
Old study  
Not compared to normal vaginal delivery, comparing fetal outcomes based on types of maternal anesthesia at delivery  
3940 deliveries included in a prospective database  
The intubation rate in elective cesarean section was 1.7 %  
Confidence intervals are not provided  
**Neutral - LOE 5 - Fair**

### Parsons SJ Sonneveld S, Nolan Tl. (1998)

Is a paediatrician needed at all Caesarean sections?  
**Author's Comment:**  
Old study performed in Tansmania  
Deliveries included approximately 32000  
Compared with vaginal deliveries  
The intubation rate or CPR in normal vaginal deliveries was 0.3 % vs cesarean sections 2.2 % and repeat cesarean sections 0.55 %.  
Confidence intervals are not provided  
**Neutral - LOE 2 - Good**