Clinical question.
In neonates receiving resuscitation (P) does the use of mouth-to-mouth, mouth-to-mask, mouth tube to mask (I) as compared to a self-inflating bag (C) give equivalent outcomes (stable spontaneous breathing) (O), when devices for delivering PPV are not available?

Is this question addressing an intervention/therapy, prognosis or diagnosis? Therapy
State if this is a proposed new topic or revision of existing worksheet: New question

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).
OVID, COCHRANE, EMBASE and ENDNODE of ILCOR
Resuscitation/instrumentation/methods=0 in OVID, EMBASE and COCHRANE
Asphyxia Neonatorum/mortality/therapy-50 in OVID. All therapy after birth. EMBASE-1, COCHRANE-17 all therapies like hypothermia.
Cardiopulmonary resuscitation/ instrumentation OVID 31 , 0 for neonates., EMBASE 53- 4 for neonates. COCHRANE 19
Resuscitation/tube and mask/ neonate OVID 128- 22 neonatal, EMBASE 177 neonate 4 (Not applicable)
Resuscitation /mouth to mouth OVID 337, 16 neonatal, Embase 218 neonate 4 (not applicable)

State inclusion and exclusion criteria
Inclusion- Study included resuscitation at birth with either tube and mask or mouth to mouth or mouth to mask
Exclusion-Resuscitation reviews, laryngeal mask, only bag and mask ventilation, ventilation beyond birth.

Number of articles/sources meeting criteria for further review:
9 articles are included in the review. Even though some of them are not clinical studies they are included for risk of mouth to mouth ventilation, and laboratory experiments with different devices
### Summary of evidence

#### Evidence Supporting Clinical Question

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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
### Evidence Neutral to Clinical question

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**Level of evidence**

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- E = Other endpoint

*Italics = Animal studies*

### Evidence Opposing Clinical Question

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**Level of evidence**

- A = Return of spontaneous circulation
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- E = Other endpoint

*Italics = Animal studies*
REVIEWER’S FINAL COMMENTS AND ASSESSMENT OF BENEFIT / RISK:

There is only 1 study (Massawe1996 LOE2) that compared mouth to mask to bag and mask ventilation. This was done in India and Tanzania with slightly different results. In Tanzania it showed APGARS equal to or more than 4 were more frequent with mask and tube, India cry within 5 minutes more frequent with bag and mask. Both mouth to mask (MM) and bag and mask(BM) groups had heart rate above 130/bpm in16/19(MM) and 16/16(BM) in Bombay and 12/25(MM), 11/26(BM) Tanzania.

Bang 2005 (LOE3) demonstrated that tube and mask and bag and mask were equivalent in decreasing birth asphyxia and were better than mouth to mouth.

3 studies (Milner 1992LOE5, Milner 1990 LOE5, Terndrup 1989 LOE5) demonstrated that tube to mask can be easily taught and acceptable breaths delivered.

High rate of infection with mouth to tube ventilation. (Roberts 1973 LOE5)

2 studies surveyed preferences (Coffey 2007 LOE5 and Roberts 1973 LOE5) and practices. Tube and mask were more difficult to use (Coffey 2007, Bang 2005).

Acknowledgements:

Citation List


COMMENTS: Descriptive study of different time periods. The trail was not designed to compare different methods of resuscitation. Initially the TBA practiced mouth to mouth resuscitation, and then there was an observation period. In the intervention phase they initially used tube and mask and subsequently bag mask. The reasons for the change are not provided. Asphyxia specific mortality rate was 10.5 with mouth to mouth and 3.5 with tube and mask and bag and mask. Asphyxia mortality + fresh still birth rate was 21.9 with tube and mask and 16.0 with bag and mask. During the earlier period when they trained the TBA in mouth to mouth they found a 11.7% reduction in mortality and 41.8% reduction with tube and mask. Difficulties listed with tube and mask was, difficult to resuscitate up to 15 minutes and blow at 30-40times a minute, Position of bending down was uncomfortable. Once they got tired they could not tell if blowing pressure was adequate. LOE 3 Fair study.


COMMENTS: Survey of experts identified through recent global meetings and word of mouth. Response rate was 28%922/80).Half the respondents were from sub Saharan Africa, 21% were from South East Asia. Currently Bag and mask are used in 90% tertiary, 95% secondary an, 62% primary
and 19% home based. Tube and mask are used in 36% tertiary, 18% secondary, 18% primary and 45% home deliveries. There were only 4 respondents that had actually used the tube and mask device. Cleaning was reported to be difficult with both devices. Bag and mask was reported to be easier to use.

LOE 5 fair study


COMMENTS: Two country study designed to compare mouth to mask and bag and mask ventilation. Different protocols were used in the 2 countries; Efficacy was assessed by APGAR, time to first grasp, time to first cry and oxygen saturation levels. Babies were allocated by predetermined alternating study periods lasting 1.5-2 months. Study in Dar es Salam was also restricted to the day time only. Insufflation pressures were 30 cm H2O with mouth and mask and 41 and 30 in with bag and mask in India and Tanzania respectively. In India cry within 5 minutes occurred more frequently with bag and mask p<0.05. In Tanzania APGAR scores of equal to or more than 4 at 1 and 10 minute were more frequent in mouth to mask p<0.05. Data on saturations is limited.

LOE 2 Fair


COMMENTS: Compared the respiratory rate, maximum and mean inflation pressures and inspiratory times using the mouth tube mask prototype resuscitation device. They demonstrated that the device can be used with minimum training, incorporating a water manometer led to a significant improvement in performance.

LOE 5 fair


Comments: No abstract. Tested tube and mask with 150 volunteers and showed that volunteers could be easily trained, respiratory rates were 22-25/minute, mean pressures were 15-18 cm H2O.

LOE 5 fair

COMMENTS: No abstract. Laboratory experiment. The experimenter exhaled through the tube as though resuscitating a baby. Exposed to RA small growth Staph. epidermides (Do not define what small implies), Operators throat culture Strep viridans, 5 blows on plate Staph. epidermides, 5 direct blows through tube moderate Staph., 30 blows through tube moderate staph and Neisseria, 30 blows with oxygen heavy staph. They concluded that mouth to tube resuscitation would introduce organisms into the babies lungs. LOE 5 fair


COMMENTS: No abstract. Survey replies 100/164. 23/100 stated mouth to tube was their usual method resuscitation. 65% regard mouth to tube as an effective method of resuscitation. LOE 5 fair


COMMENTS: Did not find that adults could provide mouth to mouth ventilation to a child under 1 month of age and they recommended oral sealing of the nose and nasal route to ventilation was the preferred method. LOE 5 fair


Comments: Experiment on mannequin. Acceptable breaths (10-20 mL/kg0, in 51% mouth to mouth, 45% mouth to mask and about 70% bag and mask. LOE 5 fair