MotherNewBorNews

Volume 1, No 2. **January–July** 2006

MotherNewBorNet meeting in New Delhi, India to discuss scaling-up evidence-based community interventions

To facilitate the scale-up process of evidence-based community interventions for maternal and neonatal health in Asia and the Near East, the United States Agency for International Development (USAID), the Basic Support for Institutionalizing Child Survival (BASICS) Project, the International Center for Diarrheal Disease Research (ICDDR,B) hosted the second annual workshop of **MotherNewBorNet** for its network members. The meeting, held from 9–11 July 2006, in New Delhi, India, focused on four thematic areas:

1. Prevention and management of postpartum hemorrhage
2. Prevention and management of maternal and newborn infections
3. Care of low birth weight infants
4. Healthy timing and spacing of pregnancy

In addition to presentations and dialogue on these themes, meeting participants discussed the minimal package of interventions necessary for incorporation into a maternal and newborn health (MNH) program, as well as the common indicators for assessing its impact. Skills demonstrations were conducted on active management of the third stage of labor and newborn resuscitations. Leading clinical experts, researchers, policymakers, and program managers from 14 countries (Afghanistan, Bangladesh, Cambodia, East Timor, Egypt, India, Indonesia, Iraq, Nepal, Philippines, Pakistan, Switzerland, the United States of America, and Yemen) attended the workshop.

The meeting provided participants with opportunities to:

- Learn about state-of-the-art interventions and research;
- Explore and share innovative approaches to maternal and newborn health;
- Discuss challenges for scaling-up evidence-based interventions to address maternal and newborn deaths in the community;
- Debate different approaches for improving maternal and neonatal health;
- Decide on scaling-up maternal and newborn health interventions in their countries;
- Plan for concerted actions; and
- Build collaboration or partnership with organizations from different countries.

Participants reflected on how they would apply their new knowledge and develop specific action plans to contribute to the reduction of maternal and newborn deaths in their own settings. During the meeting, participants also reviewed the progress of **MotherNewBorNet**, and provided inputs for its future direction. Presentations and other details of the meeting are available in the following web link: http://www.icddrb.org/activity/index.jsp?activityObjectID=2203.

MotherNewBorNet is a regional network of USAID partners in South and Southeast Asia and the Middle East with on-going initiatives that include community-based postpartum and newborn program interventions. Its key objective is to strengthen and scale-up community-based maternal and newborn health programs using evidence-based interventions. It was launched in April 2005 with the goal to moving research into practice to improve maternal and newborn health at the community level. It is currently hosted by ICDDR,B with support from the Global Research Activity of Johns Hopkins Bloomberg School of Public Health, and the Cooperating Agency projects of Extending Service Delivery, BASICS, ACCESS,PATH/Healthtech and POPPHI .

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To further improve the knowledge of its network members in evidence-based MNH programming, this issue of MotherNewBorNews will focus on effective program approaches for managing birth asphyxia.

Birth asphyxia: A major killer of newborns

The World Health Organization (WHO) defines birth asphyxia as failure to initiate and sustain breathing at birth[1]. It is the third major cause of neonatal death—after infections and preterm births—in developing countries and accounts for an estimated 23% of the annual 4 million neonatal deaths[2]. WHO estimates that 3% of the approximately 120 million infants born every year in developing countries develop birth asphyxia and require resuscitation. Of those, an estimated 900,000 die each year[3]. The risk of dying due to birth asphyxia varies between countries, as babies in high neonatal mortality rate (NMR) countries have an estimated eight times higher risk than babies in low NMR settings. Based on a literature search of published studies from 20 developing countries from 1989–2004, it is estimated that 24%–61% of perinatal mortality is attributable to asphyxia. The cause-specific perinatal mortality rate associated with asphyxia is generally between 10 and 20 per 1000 births[4].

Newborn babies may not breathe at birth due to many causes originating at different periods of the pregnancy. A 2001 literature review suggests that birth asphyxia may primarily be due to complications occurring during the antepartum (50%), intrapartum (40%), and postpartum (10%) periods[5]. Therefore, to reduce the incidence of birth asphyxia, interventions must be directed toward addressing the conditions that occur during each of the periods when birth asphyxia occurs. **MotherNewBorNet** recognizes the importance of interventions that lead to the prevention of birth asphyxia. However, the primary focus of this issue is on the management of birth asphyxia—that is newborn resuscitation–and not on prevention.

When done correctly, basic resuscitation will revive more than three-quarters of newborns with birth asphyxia[1]. It consists of three basic tasks: maintaining or ensuring body temperature control, clearing the airways, and inflating the lungs with air. Only in circumstances are chest compressions or drugs needed to stimulate blood circulation. The recent Lancet neonatal series classified resuscitation as an intervention "effective in reducing perinatal or neonatal mortality, or primarily determinants thereof, but there is lack of data on effectiveness in large-scale programme conditions." The authors estimate that there would be a 6%–42% reduction in all causes of neonatal mortality if programs implemented newborn resuscitation[6]. Based on this evidence of efficacy for resuscitation, **MotherNewBorNet** seeks to use this issue to encourage its members and their programs to introduce, strengthen, and/or expand their programs on management of birth asphyxia.

Although birth asphyxia can be predicted for certain obstetric conditions (such as fetal distress and preterm childbirths), most cases of birth asphyxia cannot be predicted. Therefore, every newborn should be considered at risk of asphyxia. As a result, all skilled birth attendants must be competent in newborn resuscitation and must have the necessary equipment present at every birth. Appropriate resuscitation equipment is essential for optimal management of asphyxia; however, asphyxiated babies can be resuscitated without the use of equipment. (The process for doing this will be described in the next section.)

There is a wide range of program options to improve the management, and thus the survival of, asphyxiated newborns. Newborn resuscitation is typically considered to be a clinical intervention requiring resuscitation equipment and oxygen, usually performed in a health facility. However, critical steps in newborn resuscitation not requiring equipment can improve the newborn's chance of recovery from asphyxia. The following sections describe considerations for a range of program options to improve the management of birth asphyxia, focusing on two different settings: those with and without equipment.

The first section applies to health facilities and community-based providers with a simple resuscitation device. The second section applies to facilities and community providers, and emphasizes essential early steps in newborn resuscitation that can be provided in any setting. These two sections are followed by specific program examples, resuscitation devices, research gaps, ongoing research, and service delivery efforts, as well as a description of a neonatal resuscitation algorithm. A list of available resources (including training materials on newborn resuscitation) is made available at the end of this article.

Managing asphyxia where there is equipment

When newborn resuscitation is mentioned, policymakers, program mangers, and clinicians often think of sophisticated resuscitation equipment, oxygen cylinders, and neonatal intensive care units. However, the first two tasks in the resuscitation process do not, in most cases, require any resuscitation equipment. Babies can be kept warm by drying and wrapping, and the airway cleared by correctly positioning the baby's head. At

[1] World Health Organization. Basic Newborn Resuscitation: A practical guide
[2] Joy Lawn et al, 2005. 4 million neonatal deaths: When?Where?Why? The Lancet Neonatal Survival March 2005
[3] World Health Organization. The World Health Report, 1998: Life in 21st Century F A Vision for All. WHO: Geneva; 1998.
[4] Ellis M, Manandhar D. Progress in Perinatal Asphyxia. Semin Neonatol 1999;4:183–91.
[5] Dilenge ME, Majnemer A, Shevell MI. Long-term developmental outcome of asphyxiated term neonates. J Child Neurol 2001;16(11):781-92
[6] Gary Darmstadt et al, 2005. Evidence-based, cost-effective interventions: how many newborn babies can we save? Lancet Neonatal Series. March 2005.

tertiary or secondary health facilities, other means (such as suctioning or insertion of endotracheal tubes) can be used to maintain a clear airway, if necessary.

Equipment for inflating the baby's lungs with air is an essential component of the third task. There is evidence that basic resuscitation using a bag and mask is sufficient to provide adequate ventilation to an asphyxiated newborn. Studies also show that room air is just as effective as oxygen for resuscitation[7]. Given the relatively inexpensive cost of the equipment and no need for supplemental oxygen, all health facilities—in particular those that provide childbirth services—must have this basic resuscitation tool. The need for all health facilities to have the capacity to resuscitate asphyxiated newborns is underscored by the unpredictability of most cases of birth asphyxia. Therefore, it is essential that all health facilities that conduct childbirths have at least the basic resuscitation equipment (bag and mask or tube and mask), and that all birth attendants at these facilities have access to the equipment and are competent in using it.

All programs working to improve newborn health should advocate at national, provincial, and district levels to ensure that health facilities have the capacity to resuscitate asphyxiated newborn babies, guaranteeing every newborn the right to breathe. The WHO definition of Basic Emergency Obstetric Care (BEmOC) does not emphasize care for the newborn including resuscitation; however, a number of organizations recognizing this deficiency have revised the BEmOC components to incorporate newborn care elements including resuscitation[8]. These organizations are advocating for the phrase BEmOC to be changed to Basic Emergency Obstetric and Newborn Care (BEmONC), thereby ensuring that all facilities with this designation have the capacity to provide emergency newborn care including basic newborn resuscitation.

The more sophisticated and expensive equipment should be left for the tertiary health facilities. (A review of existing equipment for supplying air/oxygen into the lungs is discussed later in this paper.) In these settings, equipment must be available, in working order, and readily accessible, and providers must have both the necessary competencies to use the equipment as well as the prompt recognition of and action to treat birth asphyxia. In many health facilities, there is no working resuscitation equipment, or the equipment is locked up and only made available when supervisors/providers feel a baby may have difficulty breathing or when a baby is diagnosed with asphyxia. It is often the case that, programs purchase and distribute resuscitation bags and masks, but do not address the issue surrounding accessibility and maintenance of this equipment. Having equipment that is not accessible or not in working order when needed cannot save the lives of asphyxiated babies. Some programs have addressed this issue through the creation of a resuscitation center open to all birth attendants within the delivery room. In this center, all resuscitation related equipment and supplies are stored and checked on a daily basis. This area need not be fancy; it can consist of a table with a clean cloth cover in a well-lit area, big enough for the baby and with space for a container to house equipment and supplies. Training providers to properly disassemble, clean, disinfect, and re-assemble the ventilation bag and mask will ensure that they are appropriately maintained.

Often pre-service training on management of birth asphyxia is not competency-based; therefore, it is difficult for providers to have the confidence to initiate the resuscitation process when confronted with an asphyxiated baby. In addition, in some countries, training may be limited to a particular cadre of service providers (e.g., pediatricians). Competency-based in-service training on newborn resuscitation for all skilled birth attendants is essential to ensure that most, if not all, asphyxiated babies get appropriate care when delivered by skilled birth attendants. Once trained and competent, providers can lose their competencies if they do not practice their newly acquired skills. This is a likely situation because newborn resuscitation is not an every day event. Some programs have supported providers in maintaining their competencies by having them undergo supervised practice on models, or by arranging refresher training at various time intervals. Developing a system for the maintenance of providers' resuscitation skills is essential to making certain that asphyxiated babies are managed appropriately.

Death and/or criterion-based audits for every stillbirth (excluding obviously macerated babies) and newborn death are important tools that programs can use to maintain providers' performance and quality improvement. During these audits, steps taken by providers in resuscitating stillbirths or asphyxiated babies are reviewed using agreed upon standards or protocols established for that particular facility. While death audits review cases of newborn mortality, criterion-based audits include both newborns who died and those who survived their condition.

Program managers may also want to consider facilitating advocacy at the national level to support legislation that allows every birth attendant to perform basic newborn resuscitation, and the development of national guidelines and standards for newborn resuscitation describing the minimum required practices and equipment for different levels of care (e.g., home, health center, hospital).

[7] Ramji S et al. 2003. Resuscitation of asphyxiated newborns with room air or 100% oxygen at birth: a multicentric clinical trial. Indian Pediatr. 2003 Jun; 40(6):510-7
[8] ACCESS 2005. Household-to-hospital continuum of maternal and newborn care

Ineffective or harmful resuscitation practices at the health facility level

A number of resuscitation related practices routinely performed by birth attendants at health facilities with access to equipment and medication have no evidence of being beneficial to babies. Some may even be harmful. Below is a list of practices that should be avoided:

1. Routine aspiration of the upper airway: There is no evidence that routine aspiration of the newborn's mouth and nose as soon as the head is born or later is of any benefit if the amniotic fluid has been clear[9]. Therefore, the procedure is unnecessary for newborns that start crying or breathing immediately after birth. Moreover, routine suctioning is associated with hazards such as cardiac arrhythmia[10].

2. Routine gastric suctioning: There is also no justification for routine gastric suctioning at birth[10].

3. Postural drainage: Holding the newborn upside down by the legs to encourage postural drainage and slapping the back are not effective and could be dangerous.

4. Squeezing: Squeezing the chest to remove secretions from the airway is also dangerous as it may cause fracture, lung injury, respiratory distress, and death.

5. Sodium bicarbonate: Sodium bicarbonate is not recommended in the immediate postnatal period if there is no documented metabolic acidosis. Even in such cases, the drug must be used only after establishment of respiration and in appropriate concentrations. It should not be given routinely to newborns who are not breathing[10].

The above sections discuss issues surrounding newborn resuscitation in health facilities with basic equipment. Studies have shown that basic resuscitation using the same simple equipment can be done successfully in the community by both skilled birth attendants and trained community health workers including traditional birth attendants[11].

The issues already discussed related to competency-based training, skills retention, equipment maintenance, and quality control apply here too, and similar strategies can be used to address them. In addition, a key issue surrounding the training of community health workers in newborn resuscitation is that of cost-effectiveness and sustainability of this intervention[12]. Most birth attendants conduct delivery on a small number of women each year and may not conduct a newborn resuscitation for years, making it challenging for them to retain their competency and difficult to justify the cost of training, equipment, supplies, and the necessary close supervisory support system. Programs seeking to train CHWs on newborn resuscitation may have to target CHWs with a high volume of deliveries to make their intervention cost-effective.

Very few of the traditional resuscitation practices are beneficial; some are harmful. Slapping the newborn, soaking it in cold water, sprinkling it with water, stimulating the anus using onion juice, cooking the placenta, and milking the cord are a few examples of ineffective and harmful practices still in use[13].

Managing asphyxia where there is no equipment

Asphyxiated babies not resuscitated within 10 minutes will usually die or suffer severe brain damage. In developing countries, the majority of childbirths occur more than 10 minutes from a health facility and without a skilled birth attendant. If no action is taken to resuscitate an asphyxiated baby who was delivered at home, that baby will most likely die. Fortunately, there are simple actions that any birth attendant at a home delivery without a ventilation bag can take to stimulate breathing in some asphyxiated babies.

Stimulation by quickly drying and wrapping the baby may be all that is required to resuscitate an asphyxiated newborn. Often when babies are delivered at home they are left naked and wet and put aside until after the placenta has been delivered, irrespective of whether the baby is breathing or not. Teaching all birth attendants to immediately dry and wrap all babies—including those who fail to initiate or sustain breathing and are not obviously macerated—will reduce neonatal deaths attributable to mild asphyxia. Another action that can stimulate breathing is the gentle flicking (not smacking) of the baby's feet. If these two tactile stimulations fail, the next task is to teach home birth attendants is to open or maintain the airway by positioning the head with the neck slightly extended and initiate mouth-to-mouth resuscitation. (This was shown to reduce the asphyxia-specific mortality rate [ASMR] by approximately 12% in the India study described below.) There are no clinical trials to support the efficacy and effectiveness of these approaches for resuscitation; however, many

[9] Tyson J, Silverman W, Reisch J. Immediate care of the newborn infant. In: Chalmers I, Enkin M Keirse MJNC (eds.) *Effective care in pregnancy and childbirth*. Oxford, Oxford University Press, 1989, 1293-1312.

[10] Tyson JE. Immediate care of the newborn infant. In: Sinclair JC, Bracken MB (eds.) *Effective care of the newborn infant.* Oxford, Oxford University Press, 1992. 21-39

[11] Abbay et al. 2005. Management of birth asphyxia in home deliveries in rural Gadchiroli: the effect of two types of birth attendants and of resuscitating with mouth-to-mouth, tube-mask and bag-mask. Journal of Perinatology 2005. 25: S82-S91

[12] Save the Children Federation for the Saving Newborn Lives Initiative. Birth Asphyxia: Report of a Meeting (Capetown 29th November to 2nd December 2002), 2002.

[13] Kumar R. Effect of training on the resuscitation practices of traditional birth attendants. *Trans Royal Soc Trop Med Hyg*, 1994, 88:159-160.

anecdotal reports from clinicians and non-clinicians tout that these non-equipment dependant actions do resuscitate asphyxiated babies. Incorporating these simple actions in a birth preparedness plan—in addition to telling mothers and their families to seek care for the baby at the nearest health facility—may save the lives of some asphyxiated babies.

The ineffective and/or harmful resuscitation practices previously discussed are not performed in settings where equipment is not available. However, other practices—such as slapping/hitting the newborn, soaking it in cold water, sprinkling it with water, stimulating the anus using onion juice, cooking the placenta, squeezing the chest, postural drainage and milking the cord—are a few examples of ineffective and harmful practices still observed in the community[13]. Programs must know what the birthing and resuscitation practices are in their communities and design interventions not only to introduce effective approaches, but also to stop harmful and ineffective practices.

Management of birth asphyxia in home deliveries in rural Gadchiroli: The effect of two types of birth attendants and of resuscitating with mouth-to-mouth, tube-mask or bag–mask [14]

Bang and colleagues evaluated the effect of home-based neonatal care on birth asphyxia and compared the effectiveness of two types of birth attendants (traditional birth attendants [TBAs] and village health workers [VHWs]) and three methods of resuscitation (mouth-to-mouth, tube-mask, and bag-mask) in home deliveries in rural Gadchiroli, India. TBAs used mouth-to-mouth resuscitation in the baseline years (1993–1995). In the intervention years (1996–2003), VHWs used tube-masks (1996–1999) and bag-masks (1999–2003). The incidence, case fatality (CF), and ASMR during different phases were compared.

Results from the study revealed that during the intervention years, 5,033 home deliveries occurred. VHWs were present during 84% of these deliveries. The incidence of mild birth asphyxia (no cry or breathing absent or slow, weak or gasping at 1 minute after birth) decreased by 60%—from 14% in the observation years (1995–1996) to 6% in the intervention years ($p<0.0001$). The incidence of severe asphyxia (breathing absent or slow, weak or gasping at 5 minutes after birth) did not change significantly. However, the CF in neonates with severe asphyxia decreased by 47.5% (from 39% to 20% [$p<0.07$]) and the ASMR by 65% (from 11% to 4% [$p<0.02$]). Mouth-to-mouth resuscitation reduced the ASMR by 12%, and the tube-mask further reduced the CF by 27% and the ASMR by 67%. In comparison to the tube-mask, the bag-mask showed an additional decrease in CF of 39% and in the fresh stillbirth rate of 33%; however, these differences were not statistically significant. The study concluded that home-based interventions delivered by a team of a TBA and a semi-skilled VHW reduced the asphyxia-related neonatal mortality by 65% compared to a TBA only. The bag–mask appears to be superior to the tube–mask or mouth-to-mouth resuscitation, with an estimated equipment cost of $13 per death averted. The study was funded by Saving Newborn Lives (SNL).

Management of birth asphyxia through Bidan di Desa in Cirebon District, Indonesia

In 2003, the Program for Appropriate Technology in Health (PATH) supported by Saving Newborn Lives/Save the Children conducted a research study to improve the management of birth asphyxia in Cirebon district, Indonesia by training village midwives or Bidan di Desa[15] (BdDs) in basic resuscitation. All BdDs in the study area, together with their supervisors and program coordinators, received competency-based training in basic resuscitation. In addition, BdDs were each given a 5-minute refresher video demonstrating the basic points of resuscitation and a tube and mask device with a size one face mask. The supervisory structure was reorganized and supervisory methods were modified to a more supportive, adult-learning style. Regular follow-up was conducted at three, six, and nine months after training. The neonatal mortality rate was estimated to be 15/1,000 live births with 46% of the deaths attributable to birth asphyxia. The birth asphyxia specific mortality rate was 5.1 per 1,000 live births.

Prior to the BdDs training, a laboratory assessment of the following four types of resuscitation equipment was conducted to select the most appropriate one to use for the training:

- Ambu bag and mask
- Tospter bag and mask
- Laerdal tube and mask
- Tekno tube and mask

The assessment found the Ambu bag and mask to have the highest quality material, but also the most expensive. The tekno device was the least expensive and within the price range of the BdDs; however, it had

[14] Bang A T et al. Management of Birth Asphyxia in Home Deliveries in Rural Gadchiroli: The Effect of Two Types of Birth Attendants and of Resuscitating with Mouth-to-Mouth, Tube-Mask or Bag–Mask. Journal of Perinatology 2005; 25:S82–S91

[15] PATH. Reducing Birth Asphyxia Through the Bidan di Desa Program in Cirebon, Indonesia: Final Report Submitted by Program for Appropriate Technology in Health (PATH) to Save the Children US. Jakarta, Indonesia: PATH. March 15, 2006

a problem with its valve design, which was correctable. The two tube and masks were easier to clean than the bag and masks. A national level decision was made to use the tekno tube and mask with the corrected valve design.

One year after the training, the study results show that 65% of the trained BdDS had managed at least one case of asphyxia. Eighty-five percent of the cases were successfully managed and the baby survived. Seventy percent of the asphyxiated babies managed successfully and did not require use of the tube and mask. (They were resuscitated using tactile stimulation and/or appropriate positioning of the head and maintenance of warmth only.) There was a statistically significant (47%) decrease in birth asphyxia specific NMR from 5.1 in 2003 to 2.7 per 1,000 live births in 2004. Overall, NMR decreased by 40% from 15/1,000 to 9/1,000. The cost per asphyxia death averted was estimated to be $42. If refresher training on resuscitation is integrated into the routine supervision system, the cost per death averted is estimated to drop further to $28.

Research gaps in newborn resuscitation in developing countries

Studies have shown that CHWs, including TBAs, can be trained to recognize and appropriately manage asphyxia. However, these studies have been few in number and limited to a small number of countries. There is the need for operations research to determine how best to incorporate this training into sustainable programs and provide this at scale. One important operational question to consider is what refresher training and supervision systems are needed for workers trained to provide newborn resuscitation to retain skills, especially in community settings where asphyxia cases may be infrequent and supervision systems weak. Studies are also needed on the cost-effectiveness of programs that provide community management of birth asphyxia management for those settings with a moderate or high proportion of home births. Long-term infant and child outcome, including post-neonatal survival, growth, and developmental status, is an important new area of emerging research in programs that provide community-based resuscitation.

Routine endotracheal suction is not recommended for babies born with meconium-stained amniotic fluid (MSAF) who are energetic at birth. Studies show that tracheal intubation and suction for these vigorous babies do not reduce the incidence or severity of meconium aspiration syndrome[16]. It is not clear whether this recommendation holds true for babies born through MSAF who are not active at birth. The current recommendation is to intubate and suction non-energetic babies born through MSAF; however, research is needed to ascertain whether this recommendation is beneficial to these babies. Another area that needs further research is the role of sodium bicarbonate in the management of asphyxia in preterm babies with metabolic acidosis.

Studies have shown that the use of room air is as efficient as oxygen when used for resuscitation, and that it has no adverse effect on short-term neurodevelopmental outcomes. However, studies on its long-term impact are lacking. Also lacking is information on whether room air followed by oxygen improves both short-term and long-term neurodevelopmental outcomes for asphyxiated babies. Results from such studies may reinforce or change current international guidelines on basic resuscitation.

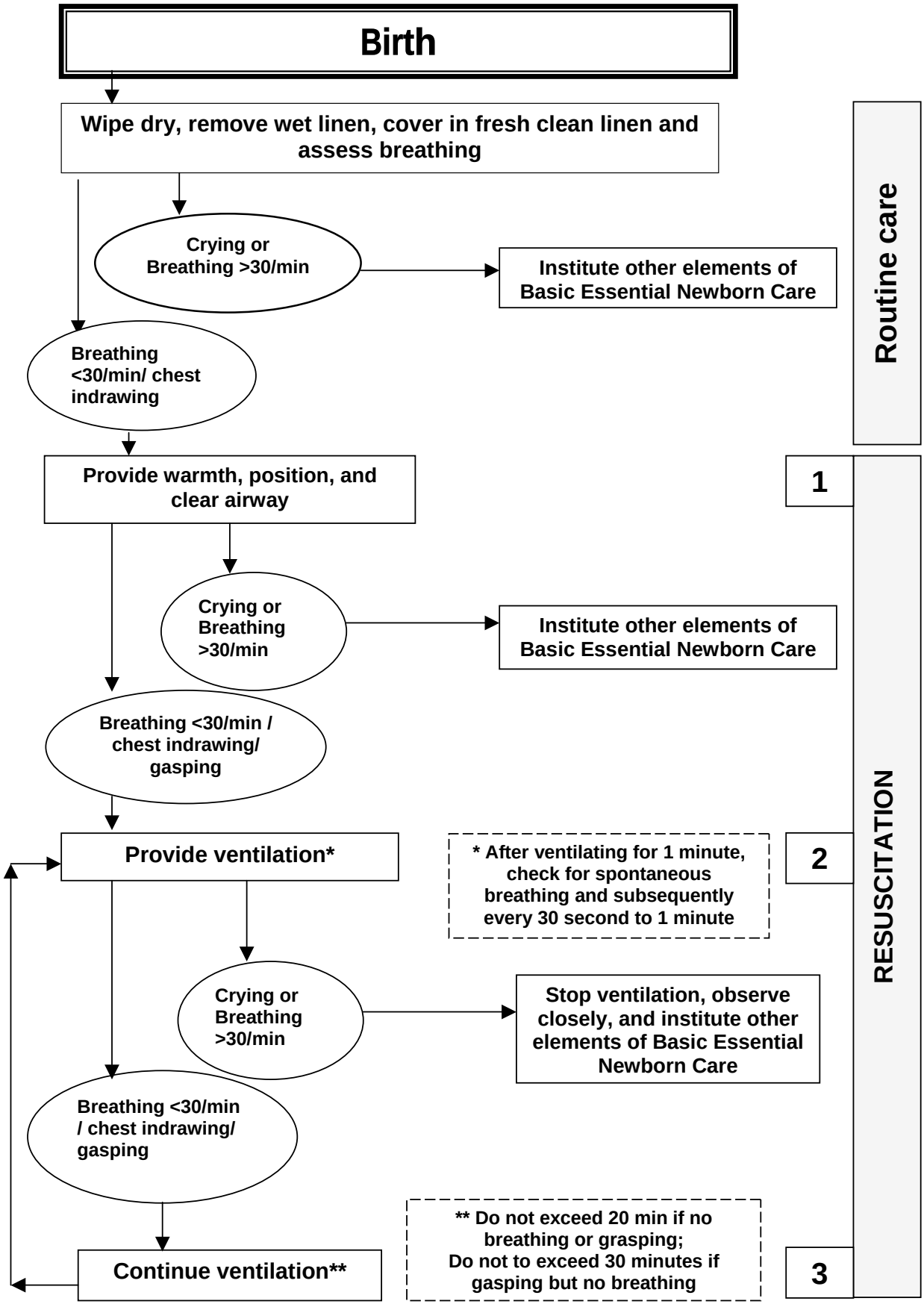
To facilitate the sharing of lessons learned on newborn resuscitation research or service delivery efforts, the Editor of MotherNewBorNews invites network members or other partners implementing newborn resuscitation programs to send short descriptions of their programs to mothernewbornet@icddrb.org. These descriptions should include information on program challenges and the strategies for overcoming them, and lessons learned on scaling-up interventions. Readers are also welcome to send comments they may have on any of the issues discussed in this newsletter.

Newborn Resuscitation Resources

Managing Complications in Pregnancy and Childbirth: a Guide for Midwives and Doctors. Published by WHO.
http://www.who.int/reproductive-health/impac/index.html
Neonatal Resuscitation. Questions and Answers Orovided by Dave Woods on the International Association for Maternal and Newborn Health (IAMANEH). http://www.gfmer.ch/Medical_education_En/PGC_RH_2004/Neonatal_asphyxia.htm
Basic Resuscitation: a Practical Guide. Published by WHO.
http://www.who.int/reproductive-health/publications/MSM_98_1/basic_newborn_resuscitation.pdf
Care of the Newborn Reference Manual. Save the Children 2004.
http://www.savethechildren.org/publications/snl/00%20-%20Care%20of%20the%20Newborn%20Reference%20Manual%20(3.6MB).pdf
Basic Maternal and Newborn Care: A Guide for Skilled Providers. JHPIEGO 2004.
http://www.jhpiego.org/scripts/pubs/product_detail.asp?product_id=522
Excerpts from WHO Guideline on Basic Resuscitation
http://www.icddrb.org/activity/index.jsp?activityObjectID=2050

[16] Wiswell TE et al, 2000. Delivery room management of the apparently vigorous meconium-stained neonate: results of the multicenter, international collaborative trial. Pediatrics 2000; 105(1):1-7.

Algorithm developed by BASICS using WHO guidelines for Newborn resuscitation



Selected ongoing newborn resuscitation research and program efforts

In 2005, the National Institute of Child Health and Human Development (NICHD) of the National Institute of Health (NIH) in partnership with the Bill and Melinda Gates Foundation launched a new research project on newborn resuscitation. The project, called First Breath: Neonatal Resuscitation in Developing Countries, aims "to determine if the combined neonatal resuscitation program/essential newborn care program compared to the WHO basic perinatal care education of health care providers (Essential Newborn Care program) results in reduced mortality due to perinatal asphyxia." This two year multi-center study is being implemented by the Global Network for Women's and Children's Health Research (GN). Study results will inform policies, service guidelines, and programs in developing countries. Additional information on this study can be found at the GN's website: http://gn.rti.org/news/index.cfm?id=99&fuseaction=detail

The Institute of Child Health in the United Kingdom is working in partnership with a local organization to study the impact of training TBAs to prevent and manage birth asphyxia at the community level in Bangladesh. The study, funded by Saving Newborn Lives/Save the Children, aims to develop and evaluate sustainable, cost-effective strategies for preventing and managing newborn resuscitation that can easily be scaled-up. The study builds on the framework of an existing randomized controlled trial of sustainable models of maternal and perinatal care in poor, rural areas of three districts in Bangladesh. Additional information on this study could be found at:http://www.ich.ucl.ac.uk/ich/academicunits/International_perinatal_care_unit/Research/#H4_5317

The Boston University School of Public Health Center for International Health and Development, Lufwanyama District Health Management Team, and the Tropical Disease Research Centre is implementing a study in Zambia to improve neonatal survival. The Lufwanyama Neonatal Survival Project (LUNESP) is a cluster-randomized, controlled trial aimed at determining the effectiveness of providing additional skills and support to TBAs as a means of reducing neonatal mortality during the first 28 days of life. LUNESP is conducted in Lufwanyama District in Zambia's Copperbelt Province with support from USAID. The study has three components: neonatal triage, prevention of hypothermia, and resuscitation; early antibiotic treatment and facilitated referral for presumptive neonatal sepsis; and two-dose peripartum nevirapine under TBA observation.

The aim of the first component is to reduce neonatal mortality due to events occurring immediately after delivery largely by preventing neonatal hypothermia and avoiding birth asphyxia. TBAs will be trained using a modified and simplified version of the Neonatal Resuscitation Programme (NRP). These techniques emphasize prompt initiation of measures to prevent hypothermia, immediate airway suctioning and positioning, infant stimulation, and, when necessary, rescue breathing via the use of a reusable pocket resuscitator facemask. Additional information on this study can be found at: http://sph.bu.edu/index.php?option=com_content&task=view&id=384&Itemid=4

Types of neonatal resuscitators

There are many basic neonatal resuscitation devices available on the market, making it difficult for program managers and/or skilled birth attendants to select the device that best meets their needs given the available resources. To assist programs in making an informed decision on the type of resuscitation equipment to purchase, PATH/Healthtech evaluated 11 of the currently available resuscitators that included 'a reusable bag and mask' and 'tube and mask devices'. Information in their evaluation included device features, valve parameters, cleaning-effectiveness, disinfection-durability of device, completeness of user instruction, ease of use, perceived comfort, and ease and completeness of disassembly and reassembly. All the devices were found to meet international standards for inspiratory and expiratory resistance, provide more than 200 compressions per minute, and be cleaned in less than 30 seconds. More detailed results are provided in the Healthtech/PATH USAID supported publication entitled "Practical selection of neonatal resuscitator: a field guide," which can be downloaded from their website: http://www.path.org/files/TS_nnr_guide.pdf

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MotherNewBorNet
(Facilitating Translation of Research into Action for Mother-Newborn Survival)
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