

# Neonatal Nursing and Helping Babies Breathe: An Effective Intervention to Decrease Global Neonatal Mortality

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*Helping Babies Breathe* (HBB) is an evidence-based medical educational curriculum designed to improve neonatal resuscitation and be taught in resource-limited circumstances. It has been field-tested for educational effectiveness and feasibility of wide implementation. We are committed to supporting the expansion of effective neonatal care, agree that HBB is highly suitable for that purpose, and promote the statement that “the time to act on behalf of every newborn infant is now” (Little G, Niermeyer S, Singhal N, Lawn J, Keenan W, Neonatal Resuscitation: A Global Challenge, *Pediatrics*, 2010;126(5):e1259-e1260). We also note that a program is only as effective as its systematic implementation and that neonatal nursing must serve an essential role in standard setting, education, and implementation of any bedside change in care of the newly born infant.

**Keywords:** Neonatal nursing; Helping Babies Breathe; Global neonatal mortality; Neonatal resuscitation

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The neonate has only recently attained its rightful status as a full and equal partner in the spectrum of maternal, newborn and child health (MNCH) care, research, and policy initiatives. The United Nations Millennium Development Goals (MDGs) of the international development initiative for improving the social and economic conditions of the world's poor adopted 8 goals in 2000 that have a 2015 date for attainment. Significantly, 2 of the 8 goals are directed at MNCH: MDG 4 for child health including neonatal survival and MDG 5 for maternal health.<sup>1</sup> Neonatal deaths (deaths in the first 28 days of life) are a major portion of child deaths, are often graphically depicted and monitored with under-5 mortality, and serve as a sentinel indicator of reproductive health. Most neonatal deaths occur within hours after birth.

## The Global Neonatal Death Problem

There are about an equal number of neonatal deaths (3.6 million) and stillbirths (3.3 million) in the world each year with a remarkable 98% occurring in the less-resourced and

developing world.<sup>2</sup> Authorities agree that in most resource poor areas—those places with inadequate facilities, equipment, and trained providers—reliable data and information that distinguishes between stillbirth and neonatal death are not generally available and that clinical and research efforts should be directed at both.<sup>3,4</sup> Although the stillbirth population in the resource-limited perinatal population is inadequately studied, it is apparent that a portion of stillbirths occur in late labor and delivery, are related to hypoxia, and may in fact not be stillbirths at all but babies who would respond to resuscitation efforts if recognized as such and survive if they received clinical intervention by providers skilled in resuscitation and subsequent care.<sup>5</sup>

Neonatal resuscitation is recognized as an intervention for which there is evidence of effectiveness.<sup>6-8</sup> Of the many babies who die who would benefit from neonatal resuscitation, there are 2 large groupings: intrapartum-related deaths, often and previously described by the term *birth asphyxia*, are estimated to occur at an annual rate of approximately 814 000 globally. There is an obvious relationship between this group of babies and the late pregnancy stillbirths discussed in the previous paragraph. Complications of preterm birth are estimated to be associated with a million (1,033,000) deaths globally per year. In addition to resuscitation at birth, there are other interventions for which there is considered to be reasonable evidence of effectiveness in reducing risk of neonatal death of preterm infants, including thermal support such as skin-to-skin (kangaroo) care, early breastfeeding, and prevention/treatment of infection.<sup>9</sup>

Monitoring of MDG 4 progress has revealed that although both the under-5 mortality rate and the neonatal mortality rate are slowly decreasing, an increasing proportion of under-5 deaths occur in the neonatal period or the first 28 days after

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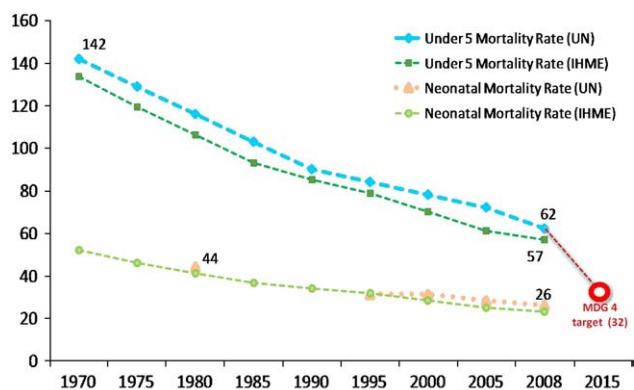
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**Fig 1.** Data from 2 sources. United Nations and the Institute for Health Metrics and Evaluation demonstrating that progress in reduction of the under-5 mortality rate slowed after rapid reduction between 1970 and 1990 and that the annual neonatal mortality rate has decreased more slowly with a resultant increased portion of neonatal deaths. Note the challenge remaining to reach the MDG 4 goal. Reprinted with permission.<sup>10</sup>

birth.<sup>10</sup> Fig 1 depicts data updated to September 2010 and calls attention to the reality that approximately 4 of 10 under-5 childhood deaths are neonatal (most of which occur on the first day) with that proportion increasing. Furthermore, the early neonatal mortality rate (first week of life) in low-income countries has shown little improvement, whereas the neonatal mortality rate has improved in high-income countries. Each of the major causes of neonatal mortality—prematurity, infection, and asphyxia—leave many survivors with lifelong disabilities or morbidities. Community mobilization and expanded effective services for women and their newly born babies will be necessary for any further progress.<sup>11</sup>

## Helping Babies Breathe

*Helping Babies Breathe* (HBB) is a hands-on educational curriculum created specifically for birth attendants in resource-limited settings. The HBB's heritage includes evidence derived from resuscitation research and previous resuscitation programs. The first page of the HBB Learner Workbook<sup>12</sup> stresses 2 basic teachings:

- All infants need to be kept clean, warm, and encouraged to breastfeed;
- An infant who does not breathe needs extra help within the first minute after birth.

These basic HBB principles are applied within an internationally harmonized, evidence-based, and carefully constructed educational program that includes recommendations for teaching techniques and site arrangements. The curriculum is developed to be taught and applied in a wide range of

environments ranging from established facilities to the most impoverished sites of health care systems. Educational and clinical equipment suitable for those environments has been developed and includes unique tools such as flip charts and low-cost manikins that serve as effective nonelectronic simulators. Field testing of the curriculum has taken place in several locations with reports appearing in the peer-reviewed literature.<sup>13</sup> The following subsections elaborate and place into neonatal care context these and other details of the HBB curriculum and program.

## Historical Background

HBB is a direct independent branch of the neonatal resuscitation tree of knowledge. It grows from appreciation of the unique physiology of the transition from fetal to neonatal existence and knowledge of the pathophysiology that can occur. The international recommendations that form the scientific basis of HBB originate from the International Liaison Committee on Resuscitation, an ongoing international effort for evidence review and derivation of recommendations for resuscitation at any age including neonatal.<sup>14</sup> HBB focuses on resource-poor environments and interventions that are effective for most neonatal resuscitation challenges, whereas recognizing that situation-specific limitations may mean that some difficult and resource-demanding problems such as the needs of extremely low birth weight babies may not be possible to treat under the circumstances at the time. The principle that every infant deserves at least initial evaluation, effort, and judgment applies.

The Neonatal Resuscitation Program (NRP) of the American Academy of Pediatrics and the American Heart Association has been a prominent leader of neonatal resuscitation development and is now in its third decade. The NRP, along with other neonatal resuscitation programs, has been taught in more than 100 countries. Experience teaching and disseminating neonatal resuscitation around the world helped expand the growing understanding of the special needs of resource-poor environments.

## Educational Design

Development of a standardized and flexible HBB education program was undertaken to facilitate use in widely varied environments. The *evaluation-decision-action* cycle repeats throughout and is presented in symbols and words. Adaptability to cultural and linguistic influences has always been a primary consideration.

The Action Plan seen in Fig 2 is a core integrative illustration within HBB and provides educational content and design information. Several specifics within HBB are worthy of note. Pictorial representation has been carefully developed to be universally recognizable. Color is seen in zones that signify the level of help needed: green, routine care; yellow, initial steps of help to breathe; and red, continued ventilation and possible need for advanced care. These colors, along with illustrations,

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