

# Appendices

## Appendix 1: The Problem

Surveys of hospitals in Ethiopia have found shortages of physicians, nurses and midwives who are trained in neonatal resuscitation. Of those with training only a third of the providers evaluated performed the skills correctly. These studies identified pre-service and in-service training in neonatal resuscitation and essential newborn care as priorities in health education planning and are strategic goals for the Ethiopian Ministry of Health (MOH). Reports have stressed the need for practical hands-on training rather than simply theoretical education. According to in-country contacts there are currently no Training Of Trainers programs in neonatal resuscitation and post resuscitation care of newborns at the medical university level in Ethiopia. *Our program is designed to alleviate this critical shortage of instructors and to develop expertise in best practice techniques: neonatal resuscitation, temperature control, prevention of infection, delivery of oxygen and intravenous fluids, and care of the asphyxiated infant. All contribute to neonatal deaths in the first week of life. This proposed program will contribute to developing standardized care in neonatal units in the university hospitals and is in aligned with the strategic goals of the Ethiopian MOH*

## Appendix 2: Needs Assessment

In October 2013 Drs. Bromberger and Davies visited the University of Gondar at their own expense to conduct a needs assessment and to formalize a partnership with the College of Medicine and Health Sciences.

The College of Medicine and Health Sciences of the University of Gondar is actively involved in training medical students, interns, residents, nurses and nurse midwives. The hospital is the major referral center for the surrounding region and has 5000 deliveries/year. The neonatal nursery has an average daily census of 20 infants.

Neonatal diagnoses associated with major morbidity and mortality include perinatal asphyxia, hypothermia, meconium aspiration pneumonia and neonatal sepsis. Neonatal care practices which have been identified as needing improvement include immediate resuscitation in the delivery room, prevention and treatment of hypothermia, delivery of oxygen, monitoring of oxygenation, preparation and delivery of intravenous fluids, prevention of nosocomial infection, and the immediate care of the asphyxiated infant. Organization and maintenance of basic equipment also presents challenges.

Medical providers actively involved in neonatal resuscitation include pediatric and obstetrical residents, interns, nurse midwives and nurses. Some providers have had training in Essential Newborn Care as well as Helping Babies Breathe, basic programs developed for providers at the community level. The heads of the Pediatric and Obstetric Departments have identified the need to standardize protocols for Neonatal Resuscitation and Post resuscitation care as well as the necessity to develop an on-going training program as top priorities to improve neonatal outcomes. Given its status as the major referral hospital for the surrounding region and as a university training program for health care professionals, developing a pre- and post-service training program which emphasizes advanced level of care for the neonate is appropriate. Such a program will build on previous educational programs (Essential Newborn Care and Helping Babies Breathe).

### **Appendix 3: Training Methodology**

The proposed training program will be based on the following well-established programs:

#### **Training Of Trainers Program**

This program will prepare instructors to teach neonatal resuscitation and post-resuscitation newborn care to their colleagues, medical residents, interns, medical, nursing, midwife students. It will empower the new instructors to become recognized in-country experts in the field and to serve as role models and resources for their colleagues and students.

**The Neonatal Resuscitation Program (NRP)** Developed by the American Academy of Pediatrics and the American Heart Association, NRP is the standard of care for neonatal resuscitation in the developed world. It is an established training program, which is appropriate for all skilled health-care providers caring for newborn babies including physicians, nurses, and nurse midwives. It presents standardized algorithm for the care of newborns in the first minutes of life. Through appropriate monitoring and assessment, these algorithms guide ventilation, use of oxygen, monitoring of oxygenation and cardiovascular support during resuscitation of newborns. The program is evidence-based and utilizes both lecture and skills training. Recently a basic level of NRP called "Helping Babies Breathe" (HBB) has been developed for use in low resource settings primarily at the home and community level.

**The Essential Newborn Care (ENC)**, a training program developed by the World Health Organization, focuses on basic care principles for the newborn in the first hours to seven days after birth. It was designed for use in settings of minimal health care resources, primarily at the community level. Elements of the program are appropriate for use in regional referral hospitals as well.

**The Post-Resuscitation Care Program** focuses on stabilization and care of the newborn in a hospital setting after resuscitation. Topics covered in this program include temperature control, fluid and glucose management, airway and oxygen

management, infection prevention, nutrition, complications, and care of the family. A needs assessment onsite visit to the University of Gondar in October of 2013 identified the problem areas and adapted the program to meet the needs, resources and priorities the institution. Developing standardized protocols and providing standardized training in these vital areas is important to improve overall neonatal outcomes and provide basic knowledge for all physicians, nurses and nurse-midwives.

**Adult Learning Principles** emphasizing skills training and practice have been incorporated into the course. Role-playing, using clinical scenarios, will emphasize assessment, decision-making, intervention and reassessment, which guide clinical practice. This will allow for immediate application of the course material, which has been shown to improve overall retention of knowledge and enhance application of skills to the clinical setting after completing the course. Each topic will have specific objectives for knowledge of principles and mastery of skills the student must demonstrate to successfully complete the course.

## **Appendix 4: Numbers Trained**

Part I: Neonatal Resuscitation Program Training (NRP)

16 Ethiopian Instructors Trained

Each Ethiopian Instructor will train 4 providers during the mentored portion of Part I:  $16 \times 4 = 64$

Between Part I and Part II Each Ethiopian Instructor will train 4 providers:  
 $16 \times 4 = 64$

Part II: Post-Resuscitation Care Course (PRCC)

16 Ethiopian Instructors Trained

Each Ethiopian Instructor will train 4 providers during the mentored portion of Part II:

$$16 \times 4 = 64$$

Between Part II and Part III Each Ethiopian Instructor will train 4 providers:

$$16 \times 4 = 64$$

Part III: Each Ethiopian Instructor will train 8 providers:

$$16 \times 8 = 128$$

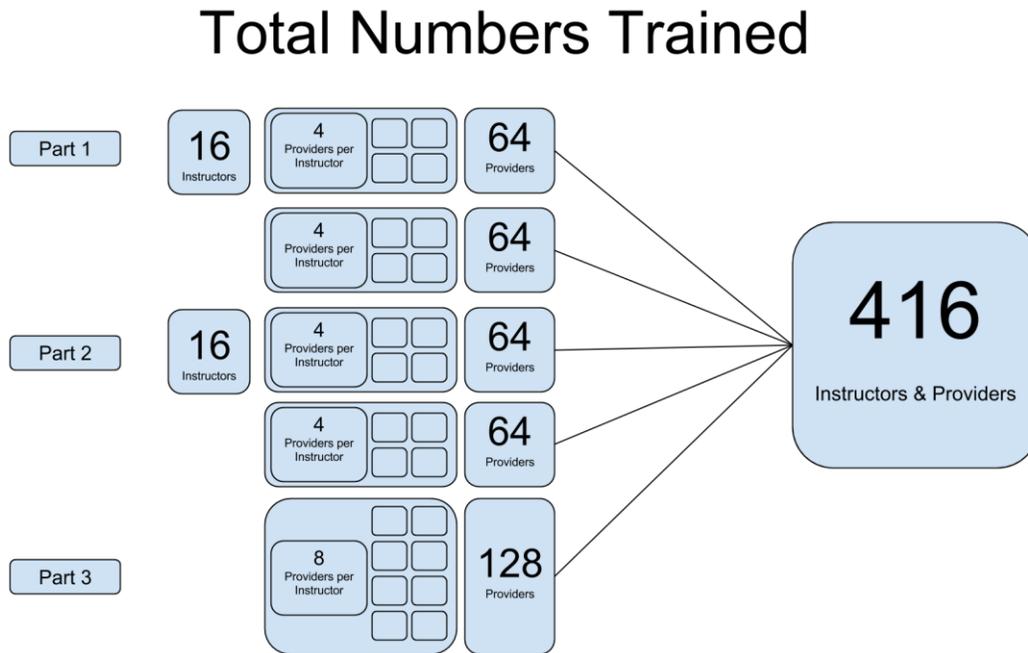
Total Numbers Trained:

Part I; 144

Part II: 144

Part III: 128

Total: 416



## Appendix 5: Project Monitoring

1. Daily course evaluations and end-of-day discussion for continuous, on-going course improvement.
2. Immediate output
  - a. Pre and post- tests of knowledge via written test (instructors and provider students)
  - b. Pre and post-tests of skills demonstration (instructors and provider students)
  - c. Successful completion of clinical scenarios, including complete resuscitation and at least one clinical scenario from post resuscitation care. (Instructor and provider students)

- d. Course evaluations by all participants for both instructor and provider courses
- 3. Outcome measurements
  - a. Newly trained instructors will be required to participate in teaching at least 1 provider training course within the 6 months following both Part I and Part II and two courses during Part III.
  - b. Track total number of courses taught, numbers of providers taught and their specialty.
  - c. NRP refresher course in part two of the training program will allow for assessment of knowledge and skills retention
  - d. Checklist for resuscitation practices to be filled out following each delivery attended by the certified course participants.
    - i. Monitor resuscitation practice
    - ii. Monitor maintenance of equipment
  - e. Ongoing morbidity/mortality discussions of resuscitation practice held by pediatric and obstetrical departments
  - f. Onsite visits by team San Diego Instructor members twice during the second year of the project to monitor and mentor the newly trained instructors.
- 4. Impact

Monitor early neonatal morbidity and mortality statistics at the University of Gondar Medical Center Hospital 12 month pre and post intervention.

## **Appendix 7: Qualifications of Instructor Students**

1. Clinical training as a general practitioner, pediatrician, obstetrician, nurse, or nurse midwife with experience caring for newborns .
2. Responsibility for teaching medical and nursing students or hospital personnel
3. Ability to teach.
4. Desire to teach.
5. Time away from clinical responsibilities to be able to teach.
6. Willingness to teach the minimum number of classes required by the project.