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GUATEMALA TECHNICAL REPORT

January 13 - 18, 1991

Roberto Sosa
MotherCare Consultant

Report Prepared for
The Agency for International Development
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ACKNOWLEDGMENTS

Dr. Barbara Schieber, INCAP

Drs. Mario Mejia,
Victor Rodas and
Heberto de Leon,
National Hospital, Quetzaltenango, Guatemala

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I. EXECUTIVE SUMMARY

The INCAP Quetzaltenango Maternal and Neonatal Health Project is an innovative project that will develop an improved case management approach to reduce maternal, intrapartum, and neonatal mortality. Project interventions include the revision of norms and protocols for the care of normal and high risk pregnancies, deliveries and neonates at the community, clinic and referral hospital levels.

From January 13-18, 1991, neonatologist, Dr. Roberto Sosa, travelled to Guatemala to assist the Quetzaltenango Hospital staff and INCAP investigators to review and revise policies and norms for neonatal care at the referral hospital level. Technical consultation was provided to the pediatric and obstetric departments of the hospital. Teaching and technical advice to develop policies and norms for the management of hypoglycemia, perinatal asphyxia, temperature control, infection, breastfeeding and general care of well and sick newborns was provided.

The Consultant found the hospital's sanitary condition to be poor, overcrowding to be particularly problematic, the nursery temperature suboptimal, and basic equipment lacking. Neonatal morbidity and mortality rates were unacceptably high, although the reliability of the data was questionable.

A policy in support of breastfeeding was, although available, not actively supported. No breastfeeding promotional activities nor educational materials for mothers currently exist. Training of hospital personnel in proper breastfeeding technique is sporadic and unsystematic and the hospital's rooming-in policy is ineffective. Hospital personnel, however, were very willing and eager to improve the quality of newborn care.

The Consultant recommended the use of a portable heater in the nursery and "cot nursing" procedures for temperature control. An adequate sink with knee and foot controls, and the use of liquid soap and paper towels were strongly encouraged for infection control. A refrigerator and milk pump were suggested to maintain the breast milk bank and the administration of a simple questionnaire to screen milk donors was recommended. Monthly management meetings between obstetricians and nursery personnel were suggested for quality assurance purposes.

II. BACKGROUND

The INCAP Quetzaltenango Maternal and Neonatal Health Project is an innovative project that will develop an improved case management approach at the community, clinic and hospital levels, to reduce maternal, intrapartum, and neonatal mortality. Project interventions include the revision of norms and protocols for the care of normal and high risk pregnancies, deliveries and neonates at the community, clinic and referral hospital levels. The process of reviewing policies and norms at the District level is already underway.

III. PURPOSE OF VISIT

The purpose of this consultancy is to revise and institute new neonatal policies and norms at the hospital level. The consultant worked with INCAP Investigators and the staff of the Quetzaltenango Hospital, specifically the hospital's newly assigned Neonatal Specialist and Chiefs of Obstetrical Services to:

1. Review policies and norms for management of normal and high risk neonates at the hospital; assess both stated policy and actual practice against internationally-accepted standards for care; and use the WHO "Check-list for Evaluating the Adequacy of Support for Breastfeeding in Maternity Hospitals, Wards and Clinics: to describe policies and proceedings surrounding breastfeeding.
2. Recommend changes in existing policies and norms to improve neonatal care and outcomes. The goal is to achieve the highest quality care possible with the resources available at the departmental level.
3. Recommend appropriate formats for presentation of norms and protocols so that they can be easily understood and used by nursing staff, medical students, interns and staff physicians working in the hospital.
4. Work with hospital staff to revise norms and protocols for selected, high-priority conditions.
5. Establish a time frame with hospital staff and INCAP principal investigators for the completion of revised policies, norms and protocols. Identify additional technical assistance requirements, if necessary.
6. Make recommendations for training hospital staff, residents and medical students in the revised norms and protocols and monitoring their performance. Prepare written recommendations for pre-service and in-service training content and suggested methods for assessing training effectiveness and monitoring performance.

IV. TRIP ACTIVITIES

A. Workplan

Monday: Orientation to the Hospital

- Morning:
- Physical layout
 - Personnel
 - Resources
 - Presentation of statistics of relevant studies

- Afternoon:
- Hospital observation
 - Meeting with INCAP officials
 - Visits to health districts
 - Presentation of INCAP diagnostic studies

Working Meeting

- Evening:
- Exchange of opinions
 - Dr. Sosa's initial impressions

Tuesday: Perinatal Asphyxia (Dr. Sosa, Dr. Raul Najarro)

- Morning:
- Explanation
 - Discussion
 - Obstetrics/neonatology
 - Initial review of norms (normalization of Apgar)

- Afternoon:
- Revise norms
 - Write/discuss process evaluation and impact indicators
 - Discuss norms for the districts

- Evening:
- Hospital observation

Wednesday:

- Morning:
- Explanation/discussion of sepsis
 - Elaboration of initial norms
 - Discussion of findings/impressions of what was observed

Friday:

- Morning:
- Evaluation of residents
 - Discussion of process and impact (indicators, methodology)

- Afternoon:
- Shopping
 - Walking around
 - Last minute details
 - Return to Guatemala City

B. Potential Products--Dr. Sosa's Visit

1. Hospital/District Norms Format

- Contents
- Themes
- Presentation

2. Themes to Discuss

- Asphyxia
- Sepsis
- Prematurity
- Low Birthweight
- Thermoregulation
- Hypoglycemia

3. Familiarity with the Hospital/Health Area

- Statistical information
- Physical site/resources
- Observatory visits

4. Data Collection System (format, analysis)

C. Participants

Dr. Sosa	Consultant
Dr. Najarro	Consultant
Dr. Mario Mejia	Chief of Neonatology
Dr. Victor Rodas	Chief of Pediatrics
Dr. Heberto de Leon	Chief of Obstetrics/Gynecology

Chiefs of Obstetrical and Pediatric Services

Obstetric and Pediatric Residents

House Physicians

Chief of Quetzaltenango Health Area

INCAP

Dr. Barbara Schieber

Dr. Carlos Gonzales

Dr. Junio Robles

V. FINDINGS/OBSERVATIONS

A. Hospital Condition

The National Hospital of Quetzaltenango is a general hospital with an obstetrical department that delivers approximately 3000 newborns per year. The sick baby nursery encompasses 3 small rooms of approximately 12 x 10 square feet each. At the time of the visit, the census was 18 sick newborns. Only two of the three rooms were functioning. There are six incubators, one radiant heat warmer and several bassinets. Overcrowding is a problem and premature infants are "doubled up" in incubators.

Overall sanitary conditions were poor. Washing facilities were minimal. There is a small sink with hot and cold running water and conventional faucets that cannot be operated with foot or knee controls. The only soap provided was bar soap used by all personnel. Hand drying is done by a cloth towel which is not discarded after each use. Although there are hot air hand dryers available, because of time involved, most of the personnel use the cloth towel. Diaper changes are a problem. Each infant is only allocated 6 diaper sets per day.

Temperature inside the nursery was cold. I estimated it to be around 60° F (there was no thermometer). The Cesarean section room was approximately 300 feet away from the nursery. Because of the building design a baby born by Cesarean section has to be transported through corridors open to the outside patios. Temperatures during certain months of the year can fall below freezing. There were no guidelines for transportation of these infants to the nursery. Lack of basic equipment is worrisome. Resuscitation facilities are suboptimal. There are no adequate sources of heat available. Disposable endotracheal tubes are cleaned and reused multiple times. Syringes and needles are in short supply. Oxygen is provided directly from a cylinder in 100% concentration, with no air mixture, humidification or heat, so that infants are subject to potentially hazardous concentrations. There is no device to monitor environment or blood oxygen. Blood pressure monitoring equipment is unavailable.

One of the bright spots of the hospital are the medical personnel. Devoted people willing and eager to improve the care of infants. I had excellent cooperation from Dr. Rodas, Chief of Pediatrics and Dr. de Leon, Chief of Obstetrics. Dr. Mejia is head of Neonatology services and is a very well trained, motivated and hard working physician. There is a residency program for Pediatrics and Obstetrics, as well as medical students that rotate through the hospital. All were interested in solving problems and attended lectures and participated in the elaboration of policies and protocols. The nursery is staffed during the day from 7 A.M. to 3 P.M. by 1 RN and 1 LPN, 3 P.M. to 11 P.M. with 2 LPNs, and during the night shift with only one LPN. Although precariously understaffed these nurses are extremely dedicated individuals who accomplish a great deal considering their lack of resources.

The neonatal morbidity and mortality statistics were presented to me which were approximately 5 fold of acceptable standards, however during the last day

of discussions there were major discrepancies in the numbers that had been presented and it appears the statistics may not be as bad as first described. Revision of the statistics has been undertaken and results will be transmitted to me at a later date.

B. Breastfeeding Policy and Practices (see Appendix A for WHO Checklist for Evaluating the Adequacy of Support for Breastfeeding in Maternity Hospitals, Wards and Clinics)

Note: The consultant prepared this section with the assistance of Dr. Mario Mejia of Quetzaltenango Hospital.

1. Policy (WHO Checklist questions 1, 2, 3, 4, 5)

A policy of support of breastfeeding practices at the hospital level does exist and is approved by the Director of the hospital and the Chief of Pediatrics and Neonatology. However, it is not a written or actively supported policy. There are no specific personnel designated to promote breastfeeding activities at the hospital, no educational material for mothers or health personnel, and no systematic training with follow-up activities for health personnel of all levels (e.g., doctor, nurse, medical students).

For example, the new Chief of Neonatology had not been informed that he was responsible for the milk bank and breastfeeding activities in the hospital. No evaluation of the different aspects of the breastfeeding program has been done yet, except this present evaluation. No evaluation of health personnel knowledge and practices has been done.

2. Staff training (WHO Checklist questions 6, 7)

There is a general awareness that breastfeeding is a good practice, however, the same applies to all other aspects of child survival programs like ORS, vaccination, and growth monitoring. It is organized as a program in the hospital with specific norms (to be revised).

Some training of breastfeeding has been done occasionally with different institutions but these have been individual, diffuse actions without coordination, evaluation, or follow-up.

3. Structure and functioning of service (WHO Checklist questions 7, 8, 9, 10, 11, 12)

Breastfeeding education is not included in prenatal control. The history of the mother's previous breastfeeding practices is not being taken.

Usually, the mother's antenatal record is not available at the time of the delivery. As already discussed under 1. Policies, no specific education about breastfeeding is given to any mother.

To questions 9, 10, and 12, the answers are negative, especially in question 12: the baby receives first a bottle in the neonatal unit and during the

night in the postpartum unit, bottles are given out so the babies don't cry at night.

There is a rooming-in policy. After the baby leaves the neonatal unit (which can take several hours or a day), he or she is put with the mother.

A very important factor for the delay in giving the baby to the mother is the unavailability of gowns for the baby so that he or she can be sent out of the neonatal unit. Clothing is very scarce and there is no extra hospital institution that provides gowns for the babies. Nor are there gowns available for mothers so they can come into the unit to nurse sick babies.

4. Health education (WHO Checklist questions 13, 14, 15, 16, 17)

As explained in the previous sections, the answers to the questions are negative.

5. Discharge (WHO Checklist questions 18, 19, 20)

No discharge package is given to the mothers (question 18). The answers to questions 19 and 20 are negative for reasons explained in the first three sections of this evaluation.

C. Actions Taken Based on this Evaluation

1. The "Liga de la Leche de Guatemala" was invited by the Unit of Neonatology to discuss strategies to improve the breastfeeding program at the hospital. It was decided that:
 - a. Gowns should be provided for mothers so they can come into the unit and nurse sick babies.
 - b. Nurses should be trained to promote breastfeeding activities in the hospital.
 - c. All premature and sick babies will receive colostrum in the unit, established by specific norms. Alternative sources of breast milk will be sought because now the supply only lasts until mid-day for the babies in the unit.
 - d. Dr. Mario Mejia is revising norms for the hospital breastfeeding program.

VI. RECOMMENDATIONS

In conjunction with medical personnel of the hospital and Dr. Barbara Schieber, norms and protocols were developed for asphyxia, sepsis in the newborn, glucose imbalance and temperature control. Also, protocols for compliance with norms and a quality assurance program was developed. These are attached (see Appendix B) as approved by the Department of Pediatrics and Obstetrics of the hospital.

The following is a narrative description of these recommendations.

Temperature Control: It was recommended that the use of portable heaters be used in the nursery to increase the temperature to a minimum of 25°C or warmer, if tolerated by nursery personnel and cot nursing should be instituted. This requires the use of several layers of clothing to minimize temperature losses (at least four towels). This was suggested for infants both in and out of incubators who do not require observation. The use of a wool hat for all neonates is also necessary. Hopefully, with the use of cot nursing for temperature control the practice of doubling prematures in one isolette will be discontinued. A simple, economical design for heat source during resuscitation which consists of 250 watt reflectors was described and recommendations made that this equipment be constructed. Guidelines for transporting infants from the C-section room to the nursery were discussed. Basically "cot nursing" procedures which included wrapping the baby in 4 pre-warmed towels, placing hat and booties, followed by immediate transport to the nursery.

Infection Control: It was recommended that the existing sink be replaced with an adequate fixture with foot or knee controls. The use of liquid soap and paper towels was strongly encouraged. (Because of budget constraints the use of home made paper towels was considered.) A hand washing surveillance program was initiated. Gown, glove, and isolation techniques were reviewed.

Breast Milk Bank: There was preoccupation that only 50% of the nutritional requirements of the infants in the nursery were supplied by the breast milk bank. This was a unanimous concern and it was decided that because the milk bank falls under the jurisdiction of WHO-Lactation Division, technical assistance, as well as additional equipment would be requested, such as a refrigerator to be installed within the nursery and electric breast milk pumps to make collections of milk more effective. Because of budgetary allocations, bacteriological and viral surveillance are not carried out, however, considering the circumstances the benefits of providing uncontrolled pooled breast milk outweigh the risks. A simple questionnaire to screen donors was developed and is attached (see Appendix C).

Hypoglycemia: Norms for the definition, diagnosis, and treatment of hypoglycemia were instituted and use of Dextrostix or Chemstrips to monitor blood glucose was suggested. At the time of the visit it appeared they had 2 bottles of Dextrostix in the nursery that were not in use.

Asphyxia: The theoretical portion of the American Heart Association-American Academy of Pediatrics Neonatal Resuscitation course was given to the

obstetricians, pediatricians, residents, medical students, and nursing staff. A manual was provided to Dr. Mejia in order for him to be certified as an instructor and in turn be able to certify additional personnel. This certification is of utmost importance and applicable to this setting. The lack of resuscitation equipment was addressed and financial sources for purchase of equipment are being explored.

Quality Assurance: Quality assurance guidelines to monitor compliance of norms and protocols established were instituted. Dr. Mejia will be in charge of this area and will report to Dr. Rodas. Monthly management meetings between obstetrical and nursery personnel were scheduled and a combined neonatal/perinatal mortality conference will be held each month. Statistics on morbidity and mortality will be collected to measure the efficacy of the protocol changes and neonatal health outcomes.

Financial Funding: Finally, possible sources for financial funding for the nursery were discussed. At the present time there is a mechanism to funnel donations into the nursery without going through government channels. A foundation (Patronato de Beneficencia) was established a few years ago, however it has not been very active. Sources such as civic clubs, fund raisers, nursery tours with potential donors and international agencies were addressed.

APPENDIX A: WHO BREASTFEEDING CHECKLIST

Annex

Check-list for evaluating the adequacy of support for breast-feeding in maternity hospitals, wards and clinics¹

The following check-list has been prepared for use by the competent authorities in countries — health and nutrition policy-makers; managers of maternal and child health and family planning services; clinicians, midwives, nursing personnel and other support staff in maternity services and facilities for the care of newborn infants; health workers' organizations; and mothers' support groups. It is intended to be a suggestive rather than exhaustive inventory of the kinds of practical steps that can be taken within and through maternity services to protect, promote and support breast-feeding, and should be used in conjunction with the main text of the joint WHO/UNICEF statement. Under ideal circumstances, the answer to all of the questions in the check-list will be "Yes". A negative reply may indicate an inappropriate practice or routine that should be modified in accordance with the statement.

¹ Hereinafter collectively referred to as "health care facilities".

Policy

1. Does the health care facility have an explicit policy for protecting, promoting and supporting breast-feeding?
2. Is this policy communicated to those responsible for managing and providing maternity services (for example in oral briefings when new staff are employed; in manuals, guidelines and other written materials; or by supervisory personnel)?
3. Is there a mechanism for evaluating the effectiveness of the breast-feeding policy? For example:
 - Are data collected on the prevalence of breast-feeding initiation and breast-feeding at the time of discharge of mothers and their infants from the health care facility?
 - Is there a system for assessing related health care practices and training and promotional materials, including those commonly used by antenatal and postnatal services?
4. Are the cooperation and support of all interested parties, particularly health care providers, breast-feeding counsellors and mothers' support groups, but also the general public, sought in developing and implementing the health care facility's breast-feeding policy?

Staff training

5. Are all health care staff well aware of the importance and advantages of breast-feeding and acquainted with the health care facility's policy and services to protect, promote and support breast-feeding?
6. Has the health care facility provided specialized training in lactation management to specific staff members?

Structure and functioning of services

7. Do antenatal records indicate whether breast-feeding has been discussed with a pregnant woman? Is it noted:
 - Whether a woman has indicated her intention to breast-feed?
 - Whether her breasts have been examined?

- Whether her breast-feeding history has been taken?
 - How long and how often she has already breast-fed?
 - Whether she previously encountered any problems and, if so, what kind?
 - What type of help she received, if any, and from whom?
8. Is a mother's antenatal record available at the time of delivery?
- If not, is the information in point 7 nevertheless communicated to the staff of the health care facility?
 - Does a woman who has never breast-fed, or who has previously encountered problems with breast-feeding, receive special attention and support from the staff of the health care facility?
9. Does the health care facility take into account a woman's intention to breast-feed when deciding on the use of a sedative, an analgesic or an anaesthetic, if any, during labour and delivery?
- Are staff familiar with the effects of such medicaments on breast-feeding?
10. In general, are newborn infants:
- Shown to their mothers within 5 minutes after completion of the second stage of labour?
 - Shown/given to their mothers before silver nitrate or antibiotic drops are administered prophylactically to the infants' eyes?
 - Given to their mothers to hold and put to the breast within a half-hour of completion of the second stage of labour, and allowed to remain with them for at least one hour?
11. Does the health care facility have a rooming-in policy? That is, do infants remain with their mothers throughout their stay?
- Are mothers allowed to have their infants with them in their beds?
 - If the infants stay in cots, are these placed close to the mothers' beds?
 - If rooming-in applies only during daytime hours, are infants at least brought frequently (every 3-4 hours) to their mothers at night?
12. Is it the health care facility's policy to restrict the giving of prelacteal feeds, that is any food or drink other than breast milk, before breast-feeding has been established?

Health education

13. Are all expectant mothers advised on nutritional requirements during pregnancy and lactation, and on the dangers associated with the use of drugs?
14. Are information and education on breast-feeding routinely provided to pregnant women during antenatal care?
15. Are staff members or counsellors who have specialized training in lactation management available full time to advise breast-feeding mothers during their stay in the health care facility and in preparation for their discharge? Are mothers informed:
- About the physiology of lactation and how to maintain it?
 - How to prevent and manage common problems like breast engorgement and sore or cracked nipples?
 - Where to turn, for example to breast-feeding support groups, to deal with these or related problems? (Do breast-feeding support groups have access to the health care facility?)
16. Are support and counselling on how to initiate and maintain breast-feeding routinely provided for women who:
- Have undergone caesarean section?
 - Have delivered prematurely?
 - Have delivered low-birth-weight infants?
 - Have infants who are in special care for any reason?
17. Are breast-feeding mothers provided with printed materials that give relevant guidance and information?

Discharge

18. If "discharge packs" containing baby- and personal-care products are provided to mothers when they leave the hospital or clinic, is it the policy of the health care facility to ensure that they contain nothing that might interfere with the successful initiation and establishment of breast-feeding, for example feeding bottles and teats, pacifiers and infant formula?
19. Are mothers or other family members, as appropriate, of infants who are not fed on breast milk given adequate instruc-



tions for the correct preparation and feeding of breast-milk substitutes, and a warning against the health hazards of incorrect preparation?

- Is it the policy of the health care facility not to give such instructions in the presence of breast-feeding mothers?
20. Is every mother given an appointment for her first follow-up visit for postnatal and infant care?
- Is she informed how to deal with any problems that may arise meanwhile in relation to breast-feeding?

**APPENDIX B: IMPACT AND PROCESS INDICATORS FOR THE EVALUATION
OF THE NEONATOLOGY SERVICE OF HOSPITAL GENERAL DE OCCIDENTE**

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**TIMETABLE FOR THE NORMALIZATION OF THE CARE OF NEWBORNS
HOSPITAL GENERAL DE OCCIDENTE**

1. Week of January 14-18, 1991

Training

Initial Norms Search

- Initial care of newborns
- Perinatal asphyxia
- Cardiac pulmonary resuscitation
- Sepsis
- Hypoglycemia
- Breastfeeding
- Thermoregulation
- Impact indicators

Dynamic: Simultaneous exposition and discussion

In charge: Dr. Roberto Sosa (Consultant)
Dr. Mario Mejia (Neonatologist)
Dr. Barbara Schieber (INCAP)
Dr. Victor Rodas (Pediatric Department Chief)

Target personnel: - residents
- nurses

2. January 21-31, 1991

- a. Initial revision of norms prior to first draft.
- b. Formulation of first draft

In charge: Dr. Mario Mejia
Dr. Barbara Schieber

3. February 10, 1991

Revision of norms, first draft.

Participants: Dr. Mario Mejia
Dr. Victor Rodas
Chiefs of Wards
Instructors
Residents

4. February 15, 1991

Revision of norms for the director of the hospital for his approval.

5. February 15, 1991 on ward

Distribution of the norms at the hospital level.

INSTITUTE OF NUTRITION OF
CENTRAL AMERICA AND PANAMA
INCAP

MINISTRY OF PUBLIC HEALTH
HOSPITAL GENERAL DE
OCCIDENTE SAN JUAN DE DIOS
DEPARTMENT OF PEDIATRICS
NEONATAL UNIT

STANDARDS OF CARE FOR THE NEWBORN

Hospital

FIRST DRAFT
MAY 1991 - NOVEMBER 1991

PARTICIPANTS IN THE FORMATION AND REVIEW OF THESE STANDARDS

Dr. Victor Manuel Rodas Chief of Department of Pediatrics

Dr. Mario Mejia Chief of Neonatal Unit

Pediatric Residents
Heads of Services of Department of Pediatrics

Technical Assistance: Institute of Nutrition of Central America
and Panama

Dr. Roberto Sosa Neonatologist, All Children's
Hospital, St. Petersburg, Florida

Dr. Barbara Schieber

Dr. Alfred Bartlett: Pediatrician, Epidemiologist,
Infectious Disease Specialist

CONTENTS

1. Immediate procedures for the newborn
2. Asphyxia
3. Sepsis
4. Hypoglycemia
5. Thermoregulation
6. Indicators of control and evaluation

IMMEDIATE PROCEDURES FOR THE CARE OF THE NEWBORN

- 1.. Turn on heat source
2. Review obstetrical history of the mother:
E.g.:
 - Toxemia
 - Meconium stained liquid
 - Fetal bradycardia(s)
 - Length of time of ruptured membranes
 - Rh status (incompatibility?)
 - Gestational age
 - Ante- or intrapartum hemorrhage
- 3.. Inspect resuscitation equipment
4. Evaluate necessity of presence of pediatric resident according to case specifics (see absolute indications for the presence of pediatric resident)
5. Put on gloves (always)
6. Receive patient (newborn)
7. Aspirate nose and mouth upon delivery of the head (before delivery of the shoulders)
8. Immediately:
 - a.. Place newborn under heat source in reverse Trendelenberg position
 - b.. Dry newborn
 - c.. Change wet towel
 - d.. Suction nose and mouth
9. If there was meconium:
 - a.. Visualize trachea and aspirate
10. Initiate process of resuscitation following written scheme if there is an alteration in:
 - Respiration
 - Heart rate

- Color
- Muscle tone

11. Record APGAR

INDICATIONS FOR INTUBATION

- A. APGAR < 3 at one minute (severe depression)
- B. Prolonged mask ventilation (> 5 minutes) if effective technique used
- C. Ineffective mask ventilation
 - No improvement in heartrate
 - Patient continues cyanotic
 - No thoracic expansion
- D. When it is necessary to suction trachea
- E. Suspicion of diaphragmatic hernia

ABSOLUTE INDICATIONS FOR THE PRESENCE OF PEDIATRIC RESIDENT

- 1. Caesarian section
- 2. Meconium stained amniotic fluid
- 3. Fetal bradycardia or other fetal cardiac arrhythmia
 - Eg: Fetal heartrate > 180/min
 - < 120/min
- 4. Pre-eclampsia and eclampsia
- 5. Rh isoimmunization
- 6. Hemorrhage: Ante or intrapartum
- 7. Maternal fever

8. Ruptured membranes > 12 hours

8. Premature deliveries or pregnancies with > 2 weeks discrepancy between gestational age per LMP and per fundal height

Eg:

- Intrauterine growth retardation
- Polyhydramnios
- Oligohydramnios

10. In whatever emergency situation the obstetrician, anesthesiologist or perinatal nurse feels the presence of the resident is necessary

- Cord prolapse
- Malpresentation
- Previous manipulation by midwives

11. Multiple pregnancy

12. "Valuable" fetus

13. Child of diabetic mother

PROTOCOL FOR MANAGEMENT: ASPHYXIA

DEFINITION

All assignments of APGAR < 7 at one minute of life

RISK FACTORS FOR ASPHYXIA

1. Maternal disease
 - a. Toxemia
 - b. Acute febrile illness
 - c. Chronic medical problems
 - Hypertension
 - Diabetes mellitus
 - Nephropathy
 - Pulmonary disease
 - Cardiopathy

2. Fetal problems
 - a. Prematurity (<37 weeks)
 - b. Postmaturity (> 42 weeks)
 - c. Meconium stained fluid
 - d. Intrauterine growth retardation
 - e. Blood group isoimmunization
 - f. Twins

3. Problems with labor and delivery
 - a. Abnormal pattern or duration of labor
(precipitous or prolonged)
 - b. Unusual presentation

- Breech
 - Transverse
 - Compound
- c. Hemorrhage
- d. Cord prolapse

DIAGNOSIS

All assignments of APGAR <7 at one minute of life

RESUSCITATION EQUIPMENT

1. Heat source
2. Reflectors (150 watts) covered with fine chickenwire, at 90 cm and at a 45 degree angle
3. Soft, dry, pre-warmed towels (medium size)
4. Oxygen cylinder with flow valve and warm humidifier
5. Suction catheter (# 5-8 French)
6. Positive pressure airbag (anesthesia bag or ambu-bag)
7. Ventilation masks for term and preterm newborns
8. Tubing to connect mask for ambu-bag and ambu to oxygen cylinder
9. Laryngoscope with blade for term and preterm newborn

Newborn	# 00	} Miller type
	# 0	
	# 1	
10. Extra batteries and bulbs for laryngoscope
11. Sterile syringes = 1 cc, 2.5 cc, 5 cc, 10 cc, 20 cc
12. Pericranial needles - 1 1/2 inch, # 27, 25, 23 (one 1 1/2 inch needle to administer intracardiac epinephrine)
13. Umbilical catheters # 3.5-5

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14. One pair blunt-tipped scissors
15. White adhesive tape (micropore or transpore)
16. Benzoin solution
17. Sterile gloves
19. Stethoscope
19. Endotracheal tubes- Numbers 2.5, 3.0, 3.5
20. Suction apparatus
21. Bulb suction

MEDICATIONS

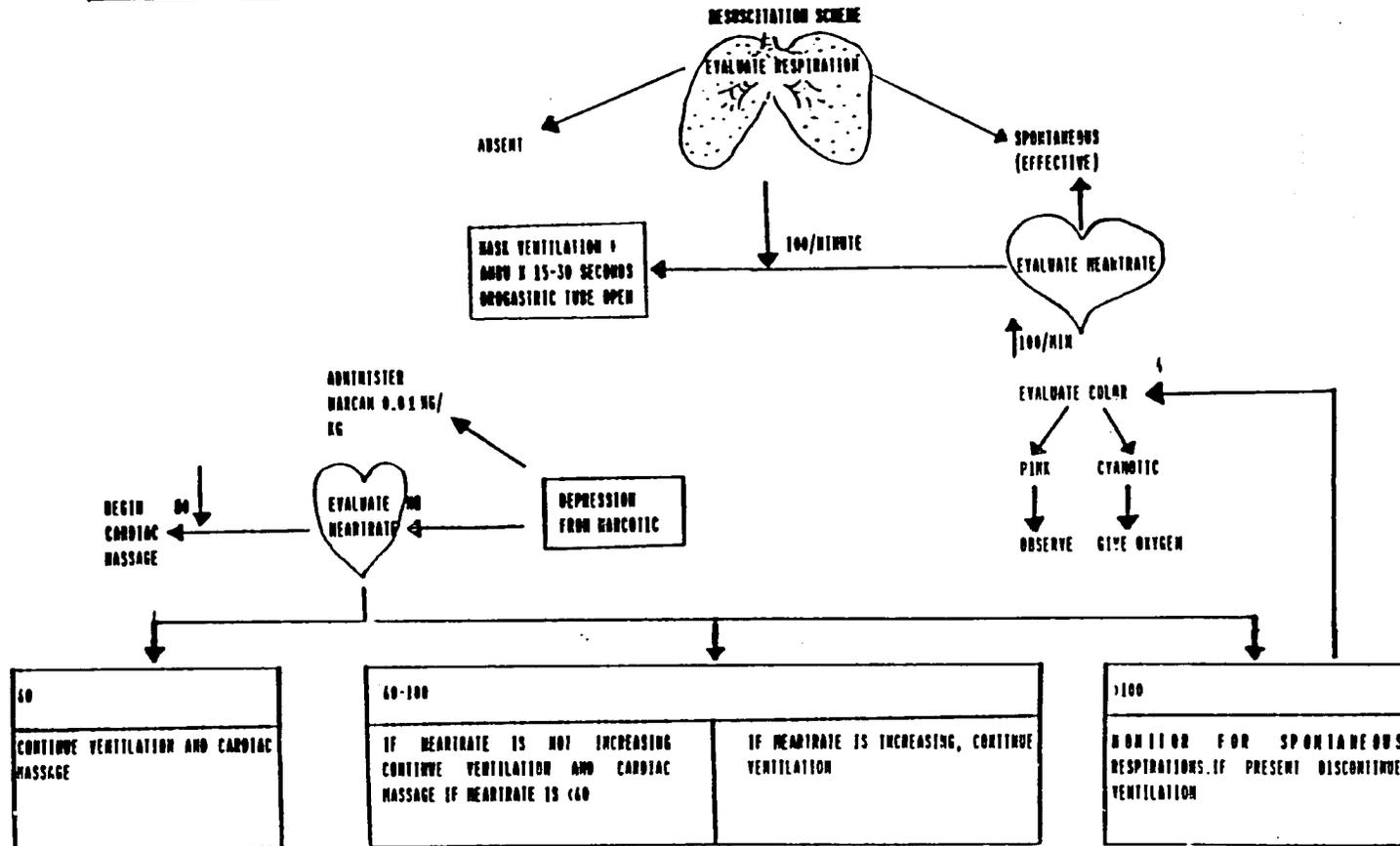
1. Sodium bicarbonate solution - 7.5% (approximately 1 mEq/ml of solution)
2. Epinephrine: aqueous solution on 1/1000
3. Physiologic IV solution
4. Lactates ringers solution
5. 25% albumin or plasma
6. 5-10% dextrose solution
7. Naloxone (Narcan)-solution of 0.4 mg/ml
8. Oxygen cylinder

Minimum number of personnel for resuscitation: 3

<u>MEDICATION</u>	<u>CONCENTRATION</u>	<u>PREPARATION</u>	<u>DOSE</u>	<u>ROUTE OF ADMINISTRATION</u>
EPINEPHRINE	1:10,000	1 ML IN 1 SYRINGE; MAY BE DILUTED 1:1 WITH NORMAL SOLUTION IF TO BE ADMINISTERED INTRA-TRACHEAL	0.1-0.3 ML/KG	I.V. OR INTRA- TRACHEAL, QUICKLY
VOLUME EXPANDERS	-O NEGATIVE OR TYPE SPECIFIC WHOLE BLOOD -NORMAL SALINE -LACTATED RINGERS	-----	10 MG/KG	IY, ADMINISTERED IN 5-10 MINUTES
SODIUM BICARBONATE	1 MeQ/ML (7.5% SOLUTION)	DILUTION OF 1 CC BICARBONATE PER 1CC DISTILLED WATER	2 MeQ/KG	IY ADMINISTRATION OVER AT LEAST 2 MINUTS OR MORE (1 MEQ/KG/MIN)
HALOXONE (NARCAN)	0.4MG/ML	DILUTE 1 ML IN 9CC TRIPLE DISTILLED W A T E R (CONCENTRATION 100 MG/ML)	10 MG/KG	IY, INTRA- TRACHEAL, IM, SUBCUTANEOUS (REPEAT PRN)

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1. PLACE NEEDLE UNDER HEAT SOURCE
2. DRY NEEDLE
3. CHANGE DRY TOWEL
4. POSITION-REVERSE TRENDLENBERG AT 45 DEGREES WITH WICK IN UPRIGHT POSITION
5. SUCTION ROSE AND MOUTH IF THERE IS MUCUS. VISUALIZATION OF TRACHEA AND ASPIRATION.
6. TACTILE STIMULATION



INITIATE MEDICATION IF HEARTRATE < 60 AFTER 30 SECONDS OF VENTILATION WITH 100% OXYGEN AND CARDIAC MASSAGE

- EVALUATE INTUBATION IF HEARTRATE < 60
- PATIENT CYANOTIC
- PROLONGED, ADEQUATE MASK VENTILATION (> 5 MIN)

EPINEPHRINE: REPEAT EVERY 5 MINUTES IF NECESSARY (13)

IF HEARTRATE < 80 AFTER EPINEPHRINE USE VOLUME EXPANDERS

FOR METABOLIC ACIDOSIS (OR SUSPICION OF) USE SODIUM BICARBONATE

12

PROTOCOL FOR MANAGEMENT: NEONATAL SEPSIS

DEFINITION

It is a disease of the newborn who is clinically ill with infection and who has positive blood cultures.

RISK FACTORS

1. Recent maternal infection (diarrhea, urinary tract infection)
2. Maternal fever
3. Managed by midwife (verified vaginal exams)
4. Prolonged rupture of membranes > 24 hours prior to birth of baby
5. Foul smelling amniotic fluid
6. Delivery under septic conditions (street, ambulance, etc.)
7. Prolonged labor:
 - Primiparas > 24 hours
 - Multiparas > 12 hours
8. Prematurity or low birth weight
9. Resuscitation (intubation with unsterile endotracheal tubes)
10. Meconium in the trachea

SIGNS AND SYMPTOMS

1. Anorexia
2. Hypothermia
3. Hyperthermia
4. Apnea
5. Changes in skin coloration
6. Irritability

7. Lethargy
8. Vomiting
9. Abdominal distention
10. Diarrhea
11. Ictericia (unexplained)

DIAGNOSIS

1.
 - a) White blood count with differential ratio of immature white cells: total neutrophils is > 0.02
 - b) Leukopenia $< 6000/mm$ (check if there was use of magnesium sulfate in the mother)
 - c) Leukocytosis $> 30,000/mm$
 - d) Absolute neutropenia $< 1,500/mm$
2. Blood culture
3. Lumbar puncture
4. Urine culture in babies > 36 hours old (supra-public puncture)
5. Xray of thorax or abdomen (symptomatic patient)

TREATMENT

A. Prophylaxis

In the potentially septic patient (penicillin and aminoglycoside)

1. Ruptured membranes > 24 hours
2. Resuscitation (intubation with unsterile endotracheal tubes)
3. Managed by midwife (vaginal exams)
4. Babies with respiratory difficulty
5. Septic delivery (maternal or environmental conditions)

Administer 2 doses of antibiotics IM/12 hours in intubated patients, then stop if their clinical state is stable and white blood count is normal

B. Proven sepsis or strong suspicion of sepsis

Treatment with aminoglycoside plus penicillin or ampicillin, or according to culture and sensitivity. Treat for 10 days.

C. Meningitis

Treat for 10 days and evaluate continuing treatment depending on lumbar puncture. Treat with chloramphenicol and ampicillin; doses vary in term and preterm newborns.

NOTE:

Give 5 cc colostrum/day to each premature baby > 1500 grams

Give prophylactic nystatin to each newborn on antibiotics, 0.5 cc during treatment.

PROTOCOL FOR MANAGEMENT:
HYPOGLYCEMIA

DEFINITION

Blood glucose < 40 mg% in term and preterm neonate

RISK FACTORS

- a) Child of diabetic mother
- b) Small for gestational age
- c) Large for gestational age
- d) Prematurity
- e) Sepsis
- f) Asphyxia
- g) Twin
- h) Polycythemia
- i) Hypothermia
- j) Other eg:
 - Beck-with syndrome
 - Tumors
 - Maternal use of medications (terbutaline, propranolol, other antihypertensives)

SIGNS AND SYMPTOMS

- a) Tremor
- b) Lethargy
- c) Apnea
- d) Cyanosis

- e) Hypothermia
- f) Convulsions
- g) Poor feeding

DIAGNOSIS

Blood glucose <40mg%

TREATMENT

- A. Babies at risk, with initial blood glucose (from laboratory) normal
 - Taken initial laboratory sample
 - Dextrostix
 - At birth and before each feeding until baby has completed 24 hours of life
 - Begin breastfeeding or bottlefeeding prior to 2 hours of life
 - Perform dextrostix immediately if baby becomes symptomatic
 - If dextrostix = 45 mg, confirm with blood glucose and begin management below
- B. Asymptomatic babies with glucose between 30-45 mg
 - Feed immediately with 10% dextrose or formula (if the state of the patient so permits) or begin I.V. solution at 90 ml/kg for 24 hours
- C. Asymptomatic babies with glucose < 30 mg
 - IV solution 10% dextrose. Bolus of 4 ml/kg, followed by maintenance 10% dextrose at 80-120 ml/kg in 24 hours. Check glucose levels with dextrostix every 15 minutes until stable
 - If glucose level does not improve in 3 evaluations (45 minutes), increase glucose concentration up to 25% in peripheral line or up to 50% in central line.
- D. Symptomatic newborn

Dextrostix and blood glucose immediately; intravenous bolus infusion of 10% dextrose at 4mg/kg followed by maintenance infusion of 10% dextrose at 80-120 ml/kg until the blood glucose concentration is between 60-90 mg.

- Check glucose levels every 15 minutes with dextrostix until stable
- If glucose level does not improve in 3 evaluations (45 minutes), increase glucose concentration up to 15% in peripheral line or up to 50% in central line

For newborns in groups I, II, III, IV who do not respond to treatment, give the following:

Hydrocortisone 5 mg/kg immediately, then 5 mg/kg/day divided into 2 doses

NOTE:

Do not initiate this treatment without consent of the neonatologist or the chief on call.

Reactive or secondary hypoglycemia

This may occur if the source of glucose is suddenly interrupted. Therefore, a gradual decrease of 5 g/day of 10% dextrose is recommended. It is advisable to include oral alimentation as this may facilitate the gradual decrease in the glucose level.

THERMOREGULATION

NEONATAL CARE

1. To avoid the loss of heat via evaporation, dry the infant immediately with pre-heated towels.

If a heat source cannot be provided, the entire room should be pre-heated to 32.5 degrees C.

2. When it is no longer necessary to observe the sick newborn who is in an incubator (eg: respiratory effort, abdominal distention, meningocele) she/he should be clothed inside the incubator. This will minimize the environmental temperature variations.
3. Ideally, the term infant or larger premature infant should be kept with his/her mother (if possible) in the same bed, with the most contact possible.
4. All premature and low birthweight newborns who cannot maintain their temperature must have a cap that covers most of their head and ears.
5. Do not bathe newborn after delivery, so as not to remove the vernix caseosa. Perform general cleansing in special cases with medical authorization.
6. Ideally, severely hypothermic newborns should be heated gradually 1 degree C/30 minutes

CARE OF SURROUNDING ENVIRONMENT

1. The temperature in the newborn ward should be maintained above 25 degrees C. at all times
2. The ambient temperature should be checked twice daily
3. The ambient temperature inside the incubator should be maintained in accordance with the standard table of scope and ASC (see table)
4. Use cellophane or wrap infant in aluminum foil.

TRANSPORT PRECAUTIONS

1. During transfer from the delivery room, the infant must be completely dry and covered by at least 4 dry, preheated towels.

MEDICATIONS

1. Heat milk, solution and blood to 32 degrees C.

**INDICATORS TO EVALUATE THE IMPACT AND PROCESS OF
THE INTERVENTION OF THE NEONATAL SERVICE
HOSPITAL GENERAL DE OCCIDENTE**

INDICATORS OF PROCESS

- a) Compliance in the use of standards for the management of each critical condition.
- b) Compliance in adequately filling out the perinatal record and the record of service.
- c) Compliance in the elaboration of the indicators in the established period.
- d) Compliance in the review sessions of morbidity/mortality cases with the Departments of Pediatrics and obstetrics once a month (ideally 2/month). Perinatal session.
- e) Compliance with the use of adequate clothing and handwashing.
- f) Compliance with administrative sessions with the personnel responsible for the unit (Chief of Service, Graduate Nurse, Resident, Nurse's Aides)
- g) Monthly statistics conference for newborn service
Responsible: Dr. Mario Mejia, Residents, Nurses, Chief
Frequency: Monthly
Source of information: Observation, clinical histories, record book from service

NOTE:

- Each session must have an agenda which the participants must have before the meeting. Each subject must have a time limit.

INDICATIONS OF INTERVENTION OF NEONATAL SERVICE

NEONATAL SERVICE

INDICATORS OF MORTALITY

- a) Mortality rate worldwide
- b) Mortality rate specified by cause (in patients admitted)

- Asphyxia

- Sepsis
- Prematurity
- Low birth weight

c) Mortality rate specified by weight

Weight < 500 g
 501 - 1000 g
 1000 - 1500 g
 1501 - 2000 g
 2001 - 2500 g
 weight < 2500 g

d) Mortality rate specified by gestational age

Frequency: Monthly
 Responsible: Neonatologist and residents
 Source of information: Clinical histories, book of admissions and discharges, neonatal service

INDICATORS FOR MORBIDITY

a) Incidence of nosocomial infections

b) Rate of asphyxiated newborns at 5 minutes

c) Incidence of iatrogenic problems

- Hypothermia upon admission and while in service
- Hypoglycemia
- Extravasation of IV solution
- Medical orders not followed

d) Incidence of:

- Hypoglycemia
- Hypothermia
- Ictericia
- Sepsis
- Meningitis
- Moniliasis
- Omphalitis
- Staphylococcal pyoderma

e) Breastfeeding (%)

Responsible: Mario Mejia, Residents, Nurses, Chief
 Frequency: Monthly
 Source: Clinical histories

THE PHYSICAL ENVIRONMENT

TABLE I

NEUTRAL THERMAL ENVIRONMENTAL TEMPERATURES*

<u>AGE AND HEIGHT</u>	<u>STARTING TEMPERATURE (°C)</u>	<u>RANGE OF TEMPERATURE (°C)</u>
0-6 Hours		
Under 1200 gm.	35.0	34.0-35.4
1200-1500 gm.	34.1	33.9-34.4
1501-2500 gm.	33.4	32.8-33.8
Over 2500 (and >36 weeks)	32.9	32.0-33.8
6-12 Hours		
Under 1200 gm.	35.0	34.0-35.4
1200-1500 gm.	34.0	33.5-34.4
1501-2500 gm.	33.1	32.2-33.0
Over 2500 (and >36 weeks)	32.8	31.4-33.8
12-24 Hours		
Under 1200 gm.	34.0	34.0-35.4
1200-1500 gm.	33.8	33.3-34.3
1501-2500 gm.	32.8	31.8-33.0
Over 2500 (and >36 weeks)	32.4	31.0-33.7
24-36 Hours		
Under 1200 gm.	34.0	34.0-35.0
1200-1500 gm.	33.6	33.1-34.2
1501-2500 gm.	32.6	31.6-33.6
Over 2500 (and >36 weeks)	32.1	30.7-33.5
36-48 Hours		
Under 1200 gm.	34.0	34.0-35.0
1200-1500 gm.	33.5	33.0-34.1
1501-2500 gm.	32.5	31.4-33.5
Over 2500 (and >36 weeks)	31.9	30.5-33.3
48-72 Hours		
Under 1200 gm.	34.0	34.0-35.0
1200-1500 gm.	33.5	33.0-34.0
1501-2500 gm.	32.3	31.2-33.4
Over 2500 (and >36 weeks)	31.7	30.1-33.2
72-96 Hours		
Under 1200 gm.	34.0	34.0-35.0
1200-1500 gm.	33.5	33.0-34.0
1501-2500 gm.	32.2	31.1-33.2
Over 2500 (and >36 weeks)	31.3	29.8-32.8
4-12 Days		
Under 1500 gm.	33.5	33.0-34.0
1200-1500 gm.	32.1	31.0-33.2
1501-2500 gm.		
Over 2500 (and >36 weeks)		
4-5 days	31.0	29.5-32.6
5-6 days	30.9	29.4-32.3
6-8 days	30.6	29.0-32.2
8-10 days	30.3	29.0-31.8
10-12 days	30.1	29.0-31.4

NEUTRAL THERMAL ENVIRONMENTAL TEMPERATURES* (Continued)

<u>AGE AND WEIGHT</u>	<u>STARTING TEMPERATURE</u>	<u>RANGE OF TEMPERATURE</u>
12-14 Days		
Under 1500 gm.	33.5	32.6-34.0
1501-2500 gm.	32.1	31.0-33.2
Over 2500 (and >36 weeks)	29.0	29.0-30.8
2-3 Weeks		
Under 1500 gm.	33.1	32.2-34.0
1501-2500 gm.	31.7	30.5-33.0
3-4 Weeks		
Under 1500 gm.	32.6	31.6-33.6
1501-2500 gm.	31.4	30.0-32.7
4-5 Weeks		
Under 1500 gm.	32.0	31.2-33.0
1501-2500 gm.	30.9	29.5-32.2
5-6 Weeks		
Under 1500 gm.	31.4	30.6-32.3
1501-2500 gm.	30.4	29.0-31.8

*Adapted from Scopes and Ahmed.³² For his table, Scopes had the walls of the incubator 1° to 2° warmer than the ambient air temperature.

Generally speaking, the smaller infants in each weight group will require a temperature in the higher portion of the temperature range. Within each time range, the younger the infant, the higher the temperature required.

From Klaus, Care of the High Risk Neonate, pg. 60.

NORMS FOR THE DISTRICTS

SEPSIS

IF THE FAMILY REFUSES HOSPITAL REFERRAL

1. Ampicillin 100 mg/kg, Genamicin 5 mg/kg intramuscularly each 12 hours for 10 days.
2. Breastfeeding.
3. Maintain temperature.
4. Inject in thigh not the buttocks.

IF THE FAMILY ACCEPTS HOSPITAL REFERRAL

Initial dose to be given in the community.

200 mg/kg ampicillin IM.

+5 mg/kg gentamicin IM.

and referral to the hospital.

SIGNS

1. Not breastfeeding.
2. Flaccid.
3. Abnormal temperature.
4. Changes in baby's cry.
5. Changes in color (blue, pale).
6. Vomiting
7. Diarrhea (more than 8 incidents) where the mother says the feces are abnormal.

PREMATURE INFANTS
(large)

1. Maintain them with an appropriate temperature.

- Minimum of 4 wrappings
- Cap
- Socks
- Always held by mother
- As much contact with mother as possible (they should sleep together)

2. Frequent nutrition.

3. Hygiene.

Otherwise, the mother should go to the hospital.

APPENDIX C: QUESTIONNAIRE FOR MILK BANK DONORS

1. Do you have or have you had a cold in the past 3 days?
2. Have you had diarrhea recently?
3. Do you have a fever?
4. Are you being treated or been told you have tuberculosis (T.B.)?
5. Have you spit up blood?
6. Have you have liver disease or been yellow during the past year?
7. Have you been hospitalized recently? Why?
8. Do you have a sore in your breast?
9. Is the baby you breastfeed healthy?