

**AIHA Trip Report  
Neonatal Resuscitation Program (NRP) Initiative  
March 1-10, 2001**

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**Objectives:**

**To assess implementation of the Neonatal Resuscitation Clinical Guidelines in institutions who have been trained by AIHA NRP Centers.**

The main focus of the trip was to complete site visits in institutions where staff has been trained in the Neonatal Resuscitation Program. This trip included site visits to 4 hospitals in the L'viv Region and 2 in the Kiev Region. A site assessment tool was developed to look at staff preparation for delivery, equipment, knowledge base of staff, chart reviews for documentation and outcomes. (Attachment) The tool was used for these visits and will be shared with the NIS Steering Committee. Completed tools from the visit to each site are also attached. In 1998, 1 year after implementation sets were distributed in the L'viv Region, site visits were made to 3 institutions where staff had been trained in NRP. Total institutions in which a site assessment was completed were 9. The summary below includes information from these visits as well although no formal toll was used at that time.

**Hospitals included:**

**February 2001**

**L'viv Region:**

Peremyshlyany District Hospital  
Gorodock District Hospital  
Novirozdil District Hospital  
City Maternity #1 in L'viv

**Kiev Region:**

Brovary Rayon Hospital  
City Maternity #6 in Kiev

**April 1998**

**L'viv Region:**

Drohobych District Hospital  
Sokal District Hospital  
NovoYavoriv District Hospital

**Summary of information from the above 9 institutions:**

**Preparation of staff:**

**Neonatologists – 100% trained.** In all institutions they are now “in charge “of neonatal resuscitation in the delivery room. This is a significant change as previously (prior to 1994) the anesthesiologists were in charge.

**Anesthesiologists – very small numbers have been trained.** Although they occasionally assist with resuscitation they have not been active in the training process.

**Obstetricians – 56% have been trained.** In 2 places, 100% of OB's have been trained and actively participate in resuscitation. In City hospitals, where the neonatologist coverage is extensive, there is no real need for Obstetricians to be trained as they do not participate in resuscitation. This is consistent with the practice in the US.

**Nurses – 69% of nurses have been trained.** Two places have trained 100% of their staff. In places where nurses have not completed formal training they have been trained

to participate in resuscitation by the neonatologists. Every place had some nurses trained.

**Midwives – 50% have been trained.** Two institutions have not trained any midwives although there are plans to do this. One place trained 100% of their midwives. It seems in the district hospitals the OB assists with resuscitation more than the midwife as she is focused on the mother.

All places in the L'viv region were trained at the NRP TC by the instructors there. Class sizes were approximately 20-25 with 4-5 instructors.

In Brovary, training was done as an outreach effort by 3 instructors. The class size was large, 32 but the training was extended over 3 days to accommodate all participants.

All places have a system for ensuring the neonatal team is at the delivery, and in these institutions the neonatologist attends all deliveries when in the hospital.

All places were no transferring high risk mothers whenever possible to Perinatal Centers in both L'viv and Kiev based on a current health administration order.

### **Preparation for Resuscitation: Equipment**

**In most institutions (8 of 9 or 89%), they had some equipment for neonatal resuscitation in the delivery room area and the equipment was set up near the resuscitation table.** All had heat sources although most were just tiny lamps, inadequate for heating. In one instance the source was too far away from the infant. All had oxygen supply.

**Equipment availability varied.** But it was clear in all places that supplies were limited and the disposable equipment that was donated to some in 1997 has been depleted. We were able to get feedback from the staff on what supplies were helpful and what they perhaps needed less of or do without. Clearly the meconium aspirator was only used in the 2 City hospitals. For others it was too foreign and they were unclear as to how to use it. More importantly, it is not easily obtainable. However, most were clear on the need to suction the trachea with a large bore catheter of some kind and many felt the deLee may be the most useful.

Even in the large City Hospitals, ambu bags and masks were few in number. Masks were very scarce, sometimes only 1 for 3 delivery rooms. Because of this, they were very worn and in some cases soiled since there was not time between use to clean them properly. The bag and mask are basic to newborn resuscitation and we were able to donate several to all places.

In one institution, the laryngoscope was stolen and it took a long time for them to replace it. When it was replaced it was done so with a plastic device with a curved blade. We will ensure this is replaced for them.

Linen, is scarce but necessary for basic thermal management of newborns.

In summary, the most significant issue is a shortage of some basic equipment needed to help newborns having difficulty transitioning to extrauterine life. At least 10% of all newborns require this assistance. Staff take care of their equipment well (and in many cases guard it – it is locked up). Delivery room areas were prepared.

## **Observation of a Delivery or Mock Code**

We were able to observe one delivery during these visits. This is not unusual as one cannot predict when the birth of an infant will occur. There were several women in labor in many places but the infants did not deliver during our visit.

During this delivery we were able to observe that the principles of neonatal resuscitation were followed well.

The use of a mock code is something instructors of the NRP TC's may want to consider as a useful tool in assessing clinical application of the principles. This will be introduced at the Steering Committee Meeting.

## **Overall knowledge of staff in NRP Principles**

The principles of NRP seem to be well implemented in all institutions but 1 (8 of 9 or 89%). Staff have a good understanding of the guidelines, evident both by the presentation of patients which were in the institutions, the review of medical records, and questions posed to them.

There are many little issues which can be improved upon and reinforced during such site visits, eg, suggestions for equipment set up, equipment use, procedures for personnel use. We took the opportunity to do this. A recertification process, which is a sustainability issue, would help with some of these problems. "Legalization" of the NRP Training Centers would give the instructors authority and responsibility to make site visits and assist with implementation. Four instructors accompanied us on these visits (only 1 per site) and found it to be helpful to see not only the assessment but how the principles were being applied. They also gained knowledge of areas which need to be stressed in future courses.

The major issue related to the course content, which needed reinforcement with many caregivers, is the management of infants with meconium in the amniotic fluid. Interestingly, this is also the section which needs the most reinforcement in the US. The issues are different however. In the NIS the issue is related to the use of the meconium aspirator, a small piece of equipment which was newly introduced in the US in the last 8 years. At most places we found this was not used, although in the City hospitals it is. This piece of suction equipment is not easy to purchase in the NIS and if one cannot intubate well, it is not functional. However, the management of these infants focused around suctioning the airway with whatever suction apparatus was available. At each site, the use of a large bore catheter for suctioning was stressed. In the new NRP Guidelines (2000), the management of meconium stained amniotic fluid is more in keeping with what is actually done in the clinical setting. We hope the introduction of these changes in the guidelines will make it easier to follow in the clinical setting.

The other major issue uncovered concerned thermal management of "normal" babies. We were quite surprised to discover that in at least 2 of the smaller institutions infants were being put in a "tub of water" directly after birth to "clean the baby and the cord, to prevent infections". This is a practice left over from the old Russian mandates. Although

current guidelines do not advise this practice, as one younger physician said, “it is hard to convince the old ones who have been practicing for 30 years that there is a problem”. Interestingly in Brovary, the neonatologist who has been there for more than 20 years stated they had given this practice up 20 years ago. The concern for the infant is temperature management and the negative effects of cold stress which complicate the transition period. It was helpful that Dr. Sulima, the chief Neonatologist of Ukraine, accompanied us and this issue was called to her attention. She was unaware it was still a practice in some places and will no doubt act to rectify it.

In review of medical records, we were able to find evidence that practice in the delivery room followed the guidelines. In one instance an excellent documentation form for resuscitation was created by a young physician, and it mirrored the guidelines exactly. When such tools are used, they also become teaching tools and help to reinforce practice.

### **Evaluation of Outcomes**

For each individual institution in the L’viv region, we were able to get some specific information about infants who were sick and transferred to the LOCH unit. This includes percentage of infants surviving, but more importantly information on the clinical condition of infants who were transferred. We also requested assistance from Dr. H. Horodenchuck, of the L’viv Health Administration, to obtain similar information from other institutions in the City who receive infants from the Oblast. To date we do not have this information. (Attachment)

A significant outcome is the decrease over time of infants who are admitted hypothermic. (Attachment) It is well established in medical literature that a cold infant can resist lack of oxygen even less than an infant whose temperature is normal. Additionally, these infants use up their glucose reserves to maintain temperature and therefore, less or none is available for the brain which is already injured from lack of oxygen.

The other important information indicates that over the last 6 years, since the implementation of NRP, the number of infants admitted to the LOCH unit with low Apgar scores (indicating potential brain compromise), has progressively decreased, suggesting that the resuscitation efforts in the maternity institutions has improved. Reduction in Perinatal and Neonatal Mortality Rates (PMR and NMR) has been concomitant. However, it would be too hasty to draw a conclusion that this reduction is solely the result of effective neonatal resuscitation. The reasons for the previous statement are:

1. The collection of statistics is fraught with a lot of irregularities, e.g. infants < 1000 grams may not even be registered as live births in all areas.
2. Are the Apgar scores themselves valid? E.g. some places had clocks but without second hands so an accurate Apgar score could never be given.
3. In the US, Perinatal mortality is attributed to the place of birth, so if a hospital has a high number of babies dying in the first week of life, that hospital would have a high PMR and NMR rates. We discovered that in district hospitals babies who were transferred to a higher level of care, and died were not counted in the birth hospital data. The maternity hospital reports a low PMR which is actually false. The death is attributed to the Level III Center and their mortality rate increases.

Conclusions about quality of care at individual hospitals cannot be drawn on for these reasons.