

Chapter 26 Neonatal Referral System: Chiang Mai Province

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Knowledge and Experiences Sharing

Background

Chiang Mai province comprises of 25 districts with the population of approximately 1646144 (October 2013). Eighty percent of populations live in mountainous areas. Nakoreping hospital is the provincial hospital responsible for caring of newborn infants. The hospital, however, has a limitation in caring of critical or severely-ill infants, particularly newborns with congenital heart disease or critically surgical conditions. All of these infants are transferred to Maharaj Nakorn Chiang Mai hospital, Faculty of Medicine, Chiang Mai University. Apart from Nakoreping hospital, other 22 community hospitals in the province also have a limitation in newborn care. All infants are referred to Nakoreping hospital, which few beds are available for high-risk newborn infants. In addition, some of high-risk newborn infants from neighboring provinces, such as Lamphun and Maehongson provinces have been referred for treatment in Nakoreping hospital as well.

Ever since the year 2003, Chiang Mai province is facing of number of premature infants that has been gradually increased. As the result, hospital beds in newborn intensive care unit was out of proportion to number of sick infants. Moreover, there were also problems of referring sick infants, such as, delayed transportation which undoubtedly adds to complications. Hence, personnel who try to setup the referral system in Chiang Mai province, together with pediatric interdisciplinary team at Nakoreping hospital has firstly established the referral system for high-risk newborn infants which finally developed to the high-risk neonatal referral network.

Conceptual Framework of High-risk Newborn Referral System

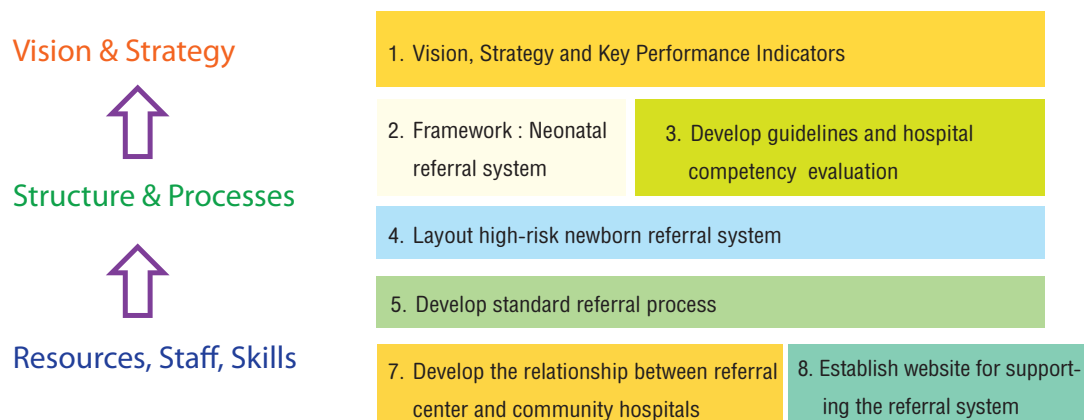


Diagram 1 Conceptual framework of high-risk newborn referral system.

Establish the High-risk Newborn Referral System

From the end of 2006 until present, Nakornping hospital is responsible for coordinating and establishing the high-risk newborn referral system in Chiang Mai province. The essential steps of implementation include:

1. Set up Vision and Strategy

In 2003, the Department of Public Health, Chiang Mai province has organized a meeting between hospitals to setup vision, strategy and responsibility for both short and long-term plan in response to an urgent situation regarding to caring of newborn infants in the province.

Vision: To set up network master plan for sufficient services of newborn infants.

Mission:

1. To develop the potentiality in efficient services of newborn infants.
2. To improve personnel competency for caring newborn infants within the hospital network.
3. To implement knowledge management system within the hospital network.
4. To set up the audit system for hospitals within the network.

2. Setup the framework

Establish role of the coordinating center: The responsibility is to coordinate fast and safe referral system for newborn infants. Moreover, A fast tract: Newborn Infant Call Center was established in order to reduce the delay and complications during transportation.

3. Setup referral guideline and level of care in hospital network

According to policy of the Ministry of Public Health, Nakornping hospital has to support hospitals within the network. As a result, it requires the ability to serve, the preparedness of personnel, medical equipment, environment and buildings according to level of care in each hospital, i.e. four levels of newborn care was established: A-Advance, S-Standard, M-Middle, F-Fundamental, Hence, that lead to the evaluation of hospital competency after classifying the level of care.

Factors	Classification of infants	Level of care
Gestational age (wk)	<28	Level A and S
	28-34	Level A, S and M
	>35	Level A, S, M and F
Birth weight (g)	<1000	Level A
	1000 - 1500	Level A or S (especially for provincial hospital)
	1500 - 1800	Level A or S or M
	>1800	Level A, S, M and F

Remarks: Nakornping hospital couldn't take care of newborn infants who need surgery or congenital heart disease

High-risk newborn referral system: Chiang Mai province

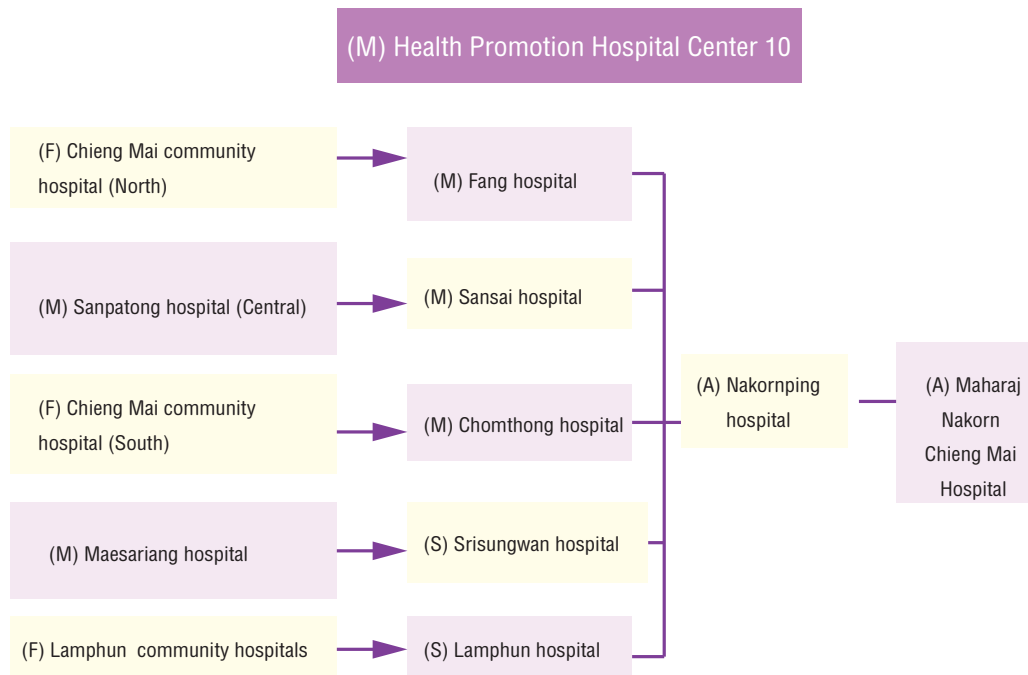


Diagram 2 Directions of referring newborn infants to respective hospitals based on potentiality.

4. Develop standard referral processes

Respective personnel are required to link all factors together regarding care of newborn infants within the area. Preliminary aims are to join and to be considerate among relative parties before and during referring infants. Its aims are to maintain standard and safety; and to solve the problems such as delayed transportation and complications during transfer and how to increase the accessibility to hospital services in the province.

5. Resources management

Human resource management requires personnel in charge of individual care, for example, respiratory distress syndrome, RDS. This plan should co-exist with the development of four community hospitals level M, which should be capable for caring the high-risk newborn infants.

6. Establish the relationship between referral center and community hospitals

Pediatric interdisciplinary team at Nakornping Hospital, has organized a meeting with physicians and nurses of hospital network to evaluate the competency in newborn care. As the result, team paid visits to hospitals after regular official hours and organized the academic meetings.

At the beginning, the meeting has been arranged to four community hospitals which had the capacity of 90 beds (level M). There was only two community hospitals that had separate unit for taking care of newborn infants. The others, newborn infants were admitted in the same unit with adult patients. Moreover, only three hospitals had full-time pediatricians. Because of lack of physicians, the pediatrician has been forced to manage patients beyond their responsibilities.

Insufficient nursing personnel is a common problem throughout the country. The registered nurses in community hospitals have been trained to care of newborn infants but lack of

confidence remains an unsolved issue because less chance of practice. Well-trained nurses are crucial besides insufficient medical equipment and long distance of neonatal transfer. With this limitation, few infants are deteriorating during transfer. At the other end, receiving hospitals have insufficient beds for the critically-ill neonate. As the result of lacking resources, Chiang Mai developmental committee, Pediatric referral committee and the Department of Public Health have come to the final decision to an expansion of Sansai community hospital, i.e., establish the neonatal intensive care unit for high-risk newborn infants to achieve better bed management.

Thereafter, the audit system has to be modified by using technique of group seminar between physicians and nurses in the topics of body temperature control, basic care of newborn infants from birth including infant's stabilization prior to transfer. The diversity among community hospitals is recognized and be summarized as an essential information for planning the newborn referral system establishment in the future.

7. Setup the information technology

The website (<http://www.nkp-hospital.go.th/clmnn>) has been setup as a tool for knowledge sharing and providing the useful information for referring newborn infants among hospitals within Chiang Mai, Lamphun and Maehongson provinces.

Result

After the implementation of referral system since 2005, work flow system including the referral system was achieved a better outcome. The better relationship and coordination among hospitals within network is finally achieved along with the Call center setup, clinical practice guideline development, academic meeting and the audit system that result in the improvement of neonatal care and the neonatal referral system.

Key Success Factors

1. Administrators and related personnel support both policy and project implementation.
2. Nakornping hospital's administrators have setup "Call center" and unit responsible for referring the high-risk newborn infants.
3. Administrator of nursing department has precise vision and managing capability of human resources and solving conflicts between personnel.
4. Financial support has been funding through the government's budget.
5. The team works with determination and sacrifice for good results.
6. The team helps transfer of knowledge and sets up the system of personnel in the hospitals within the network.
7. Working succession from the beginning until present has contributed to the realization of potential problems therefore helps the team to improve and develop its work and amends the problems.

8. The management of newborn infants' care is systemized with its own team. There are 4 teams in the ward such as the care of infants with chronic lung disease, premature babies, respiratory distress, heart disease, etc.
9. The information technology is employed, to report the number of beds in the hospitals within the network as well as exchange of data.
10. Financial support provides to develop qualified team and to give spiritual support to the team for the most effective results.

