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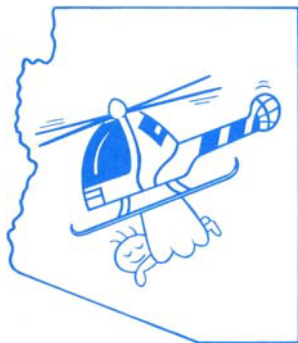
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Flight to Life . . .

Through the Arizona State Premature Transport Project, all Arizona-born high-risk infants can get the best available intensive care at one of four centers. A radio-telephone dispatch system, helicopter ambulance, and tight teamwork figure in the speedy transport of an infant to a regional center. Community residents, state and county health departments, hospitals, transport companies, insurance agencies, social workers, physicians, and nurses cooperated and coordinated efforts to provide the center services. The program, which has significantly reduced neonatal mortality, hinges on the role of the nurse. Nurses originated the idea for regionalization in Arizona; they precipitated and were involved in the planning. Specially trained nurses transport the patients, provide the intensive monitoring and care, and perform some diagnoses and complicated treatments. The public health nurse reports to the center on the paternal home, supports and guides the parents, and follows the infant after discharge. Part I of this report relates the history, funding, and growth of the program. It includes an overview of admission and transport operations and of the interrelation of center, referring, and public health personnel which allows total continuous services. Part II focuses on operations at one center, St. Joseph's Hospital in Phoenix. It details the nurse's role and continuing education and the special equipment and procedures in the intensive care nursery, where all surgery and treatments are performed. Also touched on are education programs for non-center nurses, parent participation, and community involvement.

Part I: The Take Off

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morbidity in Arizona.

The idea for the system was conceived in October

Regionalization of intensive care services for high-risk, Arizona-born infants began in 1967, under the first phase of the Arizona State Premature Transport Project. Since that time, with expansion throughout the state, the transport system has significantly reduced neonatal mortality and

1961 during a discussion between a neonatal nurse from St. Joseph's Hospital in Phoenix and a public health nurse from the Arizona State Department of Health. The two concurred that there was a local need for a workshop on care of high-risk newborns and for improved care of premature infants. The neonatal nurse thought the latter problem might be solved by a regional center for premature infant care. Her colleague completely agreed, for as she had traveled throughout Arizona as a consultant in maternal-child health, she had become very concerned about the inadequacy of care for sick and premature newborns in many small, isolated, rural hospitals.

Preliminary Study

The nurses decided to do something about the problem and undertook to precipitate a dialogue with other health care professionals on the possibility of inservice education and a center for premature infant care. The neonatal nurse took the ideas home to the Chief of Pediatrics, the Director of Nursing, and the Director of Inservice Education at St. Joseph's Hospital. The public health nurse contacted the Medical Director of the Maternal and Child Health Division, Arizona State Health Department.

In January 1962 the two OGN nurses set up a meeting with those persons as well as the Chief of Nurseries at St. Joseph's and the Supervisor of Nursing and Chief of Pediatrics at Good Samaritan Hospital. Thus, representatives from the two largest hospitals with the two largest nurseries in the state sat down to talk about improving neonatal services.

They decided inservice education on premature care would be their first goal, and held regular planning sessions, which came to include social workers from Good Samaritan and St. Joseph's, and a representative from Maricopa County General Hospital in Phoenix.

In the summer of 1962, the group officially advised the State Health Department, which was represented in the planning group of their interest in sending local physicians and nurses to other states for further education. The State Department agreed to fund the program, stipulating that the "inservice students" would return to Arizona, work to improve the care of infants in local hospitals, hold inservice education programs for their colleagues, and make recommendations for upgrading premature care in Arizona. In May, a physician member of the planning group and a nurse attended an Institute in the Care of Premature Infants at New York Hospital, Cornell Medical Center. They were the first of twelve teams sent to such institutes.

The original planning group continued their work and, in March 1964, were officially appointed the Advisory Committee on Prematurity to the Arizona State Division of Maternal and Child Health by the State Commissioner of Health, head of the Arizona Public Health Departments.

Pilot Program

The Committee then planned a state-wide seminar on care of the premature infant. It was held in March 1965 and has been repeated biannually to date. They also completed their study and survey of Arizona hospital nursery facilities and staffs, distribution of premature births and needs for intensive care. Finally, they developed a pilot program to place top-notch facilities

and staff for newborn intensive care in two regional centers.

The pilot was implemented in 1967 with Federal monies issued through the State Department of Health. St. Joseph's Hospital and Good Samaritan Hospital, with a combined annual delivery rate of over 8,000, were selected as the initial intensive care centers.

The nurseries of the two hospitals were redesigned to offer 24-hour respiratory therapy, x-ray, pulmonary function, and laboratory services. Intensive care sections were equipped with the latest electronic devices to provide special environment chambers; electric pumps for intravenous feeding; radiant warmers; oxygen analyzers (intermittent and continuous); blood pressure, heart rate, temperature, and respiration monitors; and special high-intensity phototherapy lamps. Portable incubators and supply kits were included for transporting infants.

The alterations for intensive monitoring and care were made under the direction of a neonatologist who was recruited to head the transport system and the centers by the Director of Maternal and Child Health, State Department of Health. The neonatologist also originally trained the intensive care and transport nurses.

Funding and Growth

Initially, the program operated on a very limited budget and only infants from the small rural hospitals throughout the state were transported and cared for under the system. The program is presently funded by parents, private insurance coverage of parents, funds appropriated by the Arizona Legislature, and through medical coverage for specific groups such as mining employees and Indians.

With budget increases, the system was expanded to include care for infants born in metropolitan hospitals and in the intensive care centers. Two hospital intensive care centers were added: Tucson Medical Center and Arizona Medical Center at Tucson.

To date, 1,404 babies from 63 hospitals have been admitted for care in the four centers.¹

An Overview of Admission Operations of the Phoenix Centers

A high-risk newborn is admitted to a center through the following procedures:

1. Initially, a physician in an outlying area calls the medical director of the intensive care centers and requests admission of an infant for intensive care.
2. The medical director decides whether to accept the infant according to his judgment and the standard criteria of the program (including weight and age of



Helicopter transport team and infant, St. Joseph's Hospital and Medical Center, Phoenix, Arizona

the infant and complications that may prohibit transport).

3. The medical director notifies the head nurse in the intensive care nursery of one of the centers.

4. The head nurse contacts one of the nurses who volunteered to transport infants.

5. The center notifies the ambulance service that they will accept the infant.

6. An ambulance is dispatched to the center to pick up the nurse, the transport incubator, and the equipment kit.

7. For local transport, the ambulance proceeds to the referring hospital where the infant is located. For transport from outside metropolitan Phoenix, the ambulance proceeds to the airport where an air ambulance waits to take the nurse and equipment to the referring hospital.

8. The high-risk infant is picked up at the referring

hospital where the transport nurse assesses him and, if necessary, contacts the medical director at the center for further orders prior to transport.

9. For local transport the ambulance takes the nurse and infant to the intensive care center. For transport from outside metropolitan Phoenix, the infant and transport nurse are taken by air ambulance to the Phoenix airport where a ground ambulance waits to take them to the center.

The success of the system depends greatly on immediate action by the intensive care nursing team. The nurses are able to quickly recognize ventilatory and respiratory problems, changes in body temperature, hypoglycemia, and sepsis. Their diagnoses are quickly confirmed by readily available laboratory and x-ray services. Medical consultants are also close at hand.

Communications

When the infant arrives at the center, a report on his safe arrival and condition is telephoned to the

referring hospital and physician. Either the center nursing staff or the referring physician (when he can be reached quickly) make this report to the parents. Doctors and nurses from referring hospitals are encouraged to call the intensive care center frequently for progress reports. Just prior to discharge of an infant, special instructions plus a discharge summary are telephoned, and later mailed, to the referring physician.

On admission of the infant to the center, a referral is sent to a public health nurse in the county where the child's parents reside. The public health nurse visits and evaluates the parents' home and provides support and education to the family. Her home evaluation report is mailed to the intensive care center and used to help determine the infant's discharge date. Progress reports on the infant are sent weekly to the public health nurse who also receives a discharge referral. The nurse continues to visit the parents' home to provide anticipatory and immediate guidance on the care of the infant. She sends the State Department of Health an evaluation of the infant's growth and development, made when the infant has been home for 1 month, when he is 6 months old, 1 year old, and annually thereafter for 5 years.

Reference

1. Arizona State Department of Health, Maternal and Child Health Division



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Part II: Ground Operations

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Although there are four centers now accepting high-risk newborns in Arizona's Premature Transport Project, for the sake of clarity this more detailed discussion of the operation will be confined primarily to the center at St. Joseph's Hospital in Phoenix.

equipment that is in each delivery room of St. Joseph's is in each transport bag used for infants born in other hospitals. The same nurses who staff the intensive care nursery transport "inborn" and "outborn" infants. Continuity of performance and development of skills is attained more readily with this system than with one in which a different team staffs each service.

Initial assessment of all outborn infants is made by a medical director via telephone. The transport nurse must be ready at the referring hospital to begin treatments while awaiting further telephoned instructions from the director. She frequently receives the director's order to insert umbilical vessel catheters before departure and she is prepared to enact other emergency measures such as nasotracheal intubation; administration of oxygen by bag breathing, hood, or mask; suctioning and clearing oral and nasal passages. Through a radio-telephone system, the transport nurse can always reach the director, and can alert the in-

Transport

All patients are transported to the intensive care nursery in St. Joseph's Hospital in identical self-contained incubators, either by ambulance from referring hospitals or directly from St. Joseph's delivery rooms 123 feet from the nursery.

All high-risk infants are treated alike. The same