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Publication Date

1984

Peer reviewed|Thesis/dissertation

THE PERINATAL/PEDIATRIC TRANSPORT SERVICE AT UCSF

by

CHRISTINA LEE JORDAN

THESIS

Submitted in partial satisfaction of the requirements for the degree of

MASTER OF ARTS

in

MEDICAL AND BIOLOGICAL ILLUSTRATION

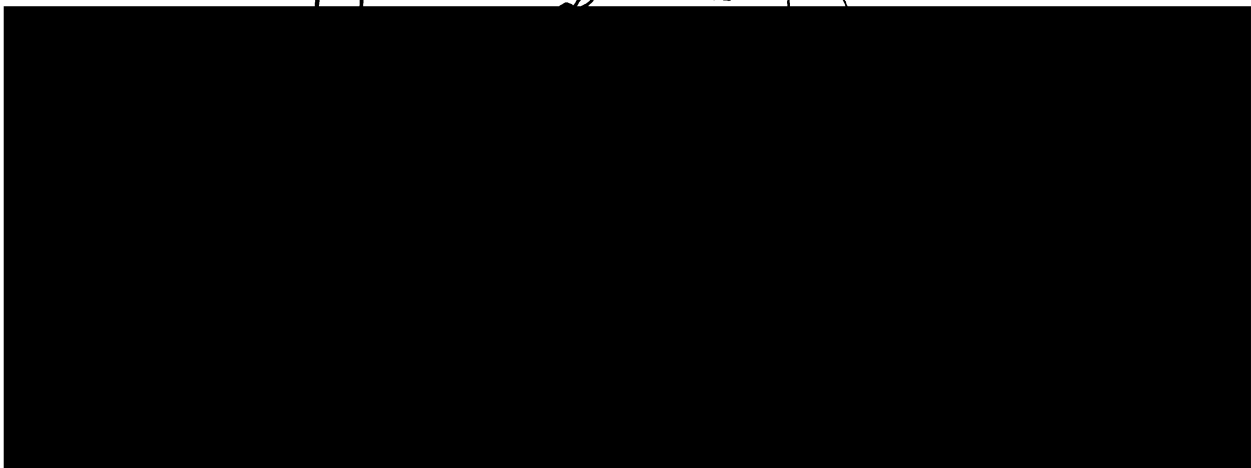
in the

GRADUATE DIVISION

of the

UNIVERSITY OF CALIFORNIA

San Francisco



Date

SEP 9 1984

University Librarian

Degree Conferred:

THE PERINATAL/PEDIATRIC TRANSPORT SERVICE AT UCSF

A Booklet for

Referring Physicians and Hospitals

Describing

UCSF's Perinatal/Pediatric Transport Service

TABLE OF CONTENTS

	Page
INTRODUCTION	1
WHEN TO TRANSPORT	3
INITIATING A TRANSPORT	5
AWAITING THE TRANSPORT TEAM	7
ARRIVAL AT THE REFERRING HOSPITAL	9
FOLLOW-UP COMMUNICATION	11
PERSONNEL AND EQUIPMENT	12
TRANSPORT COSTS	15

INTRODUCTION

As a tertiary level referral center for Northern California, the Hospitals and Clinics of the University of California, San Francisco (UCSF) offer a tremendous diversity of medical services and facilities. The Perinatal/Pediatric Transport Service provides critical care transport to UCSF for acutely ill babies, children, and expectant mothers.

The Transport Service routinely serves the area within a 300-mile radius of San Francisco. Occasionally, however, an acutely ill patient may require a particular medical treatment offered by only a handful of institutions throughout the world. If UCSF is selected to provide such treatment, the Transport Service will respond to transport requests from other regions of the United States as well as from other countries.

Patients are transported via ground or air ambulance or both. All vehicles are specially outfitted with intensive care life-support equipment. Trained UCSF Critical Care Physicians and/or Critical Care Transport Nurses lead emergency transport teams.

The UCSF Transport Service supports an integrated system of two-way and one-way transports. On a "two-way" transport, a UCSF medical team is dispatched to the referring hospital, assists the referring physician in stabilizing the patient, and transports the patient to UCSF. "One-way" transport denotes the transfer of a stabilized patient by a community hospital team to UCSF. As part of the decision to transport, the patient's clinical condition will be carefully evaluated in consultation with UCSF physicians and staff to determine if a one-way or two-way transport should be used.

UCSF also advocates the use of cost-minimizing return transport to the referring hospital once a patient's condition no longer warrants tertiary care.

WHEN TO TRANSPORT

Transport should be considered for any acutely ill patient who the referring physician believes can benefit from tertiary care. The Transport Service at UCSF maintains two 24-hour consultation hotlines to assist referring physicians in determining the advisability of transport:

*415/665-UCSF (415/665-8273)
for High-Risk Obstetrical Patients

*415/661-PEDS (415/661-7337)
for High-Risk Neonatal/Pediatric Patients

In general, transport is indicated when it is determined that the skills and support facilities at UCSF would benefit the patient. The decision to transport should be made after consultation with UCSF staff, so that the referring and receiving physicians can jointly decide the appropriate mode of transport.

Neonatal Transport

The advent of specially designed transport incubators in the 1960s provided reasonably safe transfer of infants to neonatal intensive care units. By 1975, with marked improvement of properly trained personnel and sophisticated transport equipment, neonatal mortality became independent of distance transported, a fact that supported the referral of infants to the appropriate level of care. The Intensive Care Nursery at UCSF is a 22-bed unit (including 6 intermediate beds) offering round-the-clock tertiary care for neonates with all types of medical, general surgical, and cardiac problems.

Maternal Transport

Timely identification and transport of high-risk obstetrical patients is preferable to neonatal transport in that it can further reduce perinatal morbidity and mortality. Maternal transfer makes available tertiary level obstetrical care for the duration of pregnancy and permits delivery of potentially ill newborns within steps of the Intensive Care Nursery. Transport of an at-risk mother may be indicated for maternal as well as neonatal reasons.

Pediatric Transport

The recent evolution of regional intensive care units designated solely for the treatment of children has encouraged the concept of pediatric transport. UCSF's Moffitt/Long Hospitals operate a 9-bed Pediatric Intensive Care Unit (including 3 beds for bone marrow transplant patients) providing specialized critical care for children from infancy to 18 years of age. Any child who can benefit from intensive care or the expertise of pediatric subspecialists at UCSF is a candidate for transport or referral.

INITIATING A TRANSPORT

UCSF operates both a High-Risk Obstetrics Hotline and a Neonatal/Pediatric Hotline for 24-hour emergency referrals:

*415/665-UCSF (415/665-8273)
for High-Risk Obstetrical Patients

*415/661-PEDS (415/661-7337)
for High-Risk Neonatal/Pediatric Patients

The Perinatal/Pediatric Transport Service welcomes inquiries from community physicians and hospital staffs regarding the appropriateness of transport. In some instances, clinical consultation with UCSF faculty may eliminate the need to transfer patients. If consultation results in a decision to transport and bed space is confirmed, the team will be mobilized.

The transport coordinator requires the following information to initiate a transport:

- *Patient's name, sex, age, birth date, and weight
- *Referring hospital's name, location, and telephone number
- *Referring physician's name and telephone number
- *Specific clinical condition of patient
and treatment in progress

The transport team coordinates all travel arrangements, including ground ambulance service to and from the airport in the referring community. When the transport team leaves UCSF, an estimated time of arrival (ETA) is communicated to the referring hospital. The team can normally be en route within 45 minutes of transport confirmation; arrival at the referring institution is generally within 2 hours. Extremely bad weather or lack of available transport vehicles or staff may delay or postpone transport. The referring hospital will be kept informed of any variations in schedule.

In addition to facilitating emergency referrals, the hotlines serve as a resource for information and consultation with UCSF physicians and staff specializing in the acute care of pregnant women, neonates, and children. To ensure a prompt and suitable response, the medical community is encouraged to use the hotlines during weekday business hours for nonemergency consultation/information requests.

AWAITING THE TRANSPORT TEAM

Before the arrival of the UCSF team, the referring physician and hospital staff can take certain measures to expedite a transport:

1. Continue appropriate treatment for stabilizing the patient.

Referring personnel are urged to call UCSF as often as may be helpful so that receiving physicians can share in patient management until the transport team arrives. After arrival at the referring hospital, team members will assist referring staff with stabilization of their patient.

2. Please prepare and assemble the following materials and information:

For neonatal transport:

- *Copies of mother's and baby's charts, including discharge summaries
- *Duplicate X-rays and culture specimen results
- *Physician order for transport
- *10 cc clotted maternal blood
- *10 cc clotted cord blood

For pediatric transport:

- *Copy of patient's chart, including discharge summary
- *Duplicate X-rays and culture specimen results
- *Physician order for transport
- *Specific allergies identified

For maternal transport:

- *Copy of patient's chart, including discharge summary
- *Duplicate X-rays and culture specimen results
- *Physician order for transport
- *Data on: EDC, G/P, # of prenatal visits, GA first visit, and medications taken

3. It is important to introduce the patient and family members to the concept of and clinical necessity for transport. Reassure them

that transport is a common procedure that maintains continuity of high-level supportive care between the referring hospital and UCSF. After arrival at the referring hospital, UCSF team members will provide the family with additional details about the transport.

ARRIVAL AT THE REFERRING HOSPITAL

Upon arrival at the referring institution, the transport team members introduce themselves to staff members caring for the patient. Together, team and staff members make a general assessment of the patient's clinical condition. This initial assessment aids in determining how to proceed with stabilization.

UCSF transport teams work with referring personnel in stabilization procedures. In the event that referring hospital staff are unable to participate in these efforts, team members will need to have essential resources, such as laboratory and radiology facilities, identified.

Once the patient has been safely stabilized, team members meet with the family to provide information and emotional support. During the course of this conference, team members will:

1. Obtain a signed "consent to transfer" from the patient or next-of-kin.
2. Discuss the patient's clinical condition, reinforcing the necessity for transport.
3. Provide a general prognosis, including an honest appraisal of the probable course of events after arrival at UCSF.
4. Supply the family with written materials describing the receiving unit and including:
 - *Physicians' and nurses' names
 - *Telephone numbers for the unit and primary physician
 - *A map showing how to reach the UCSF campus
 - *Information regarding the numerous support facilities at UCSF, including housing, social services, and financial counseling
5. Encourage the family to ask questions and visit or telephone the unit as frequently as possible.

6. Invite the parents of neonates to touch their infants in the transport incubator. The team leaves Polaroid® snapshots of newborns with the parents and stresses the importance of minimizing disruption of parent bonding.

After completion of stabilization and the patient/family conference, team members will transport the patient back to UCSF, contacting both the referring facility and family upon arrival.

FOLLOW-UP COMMUNICATION

Every attempt is made to keep the referring staff informed of their patient's clinical progress at UCSF. The referring physician is encouraged to visit UCSF or to telephone at any time to obtain an updated report. Interim and discharge summaries are forwarded to the referring physician during the course of the patient's hospitalization at UCSF. Further detailed information is available upon request.

UCSF Hospitals and Clinics have ongoing programs of assistance to community hospital staffs in development of skills and facilities. For consultation or information regarding outreach education programs, members of the medical community may either call or write:

The Perinatal/Pediatric Transport Office
(for pediatric information)
643 Moffitt Hospital
University of California, San Francisco
San Francisco, CA 94143
415/666-5611

or

The Perinatal Access Program
(for perinatal information)
1462 Health Sciences East
University of California, San Francisco
San Francisco, CA 94143
415/666-3868

PERSONNEL AND EQUIPMENT

The Perinatal/Pediatric Transport Service operates through contractual agreements between UCSF and King-American Ambulance Company, Air Ambulance International, Inc., and CALSTAR (California Shock Trauma Air Rescue). This cooperative arrangement consolidates the highly trained staff and sophisticated equipment vital to the provision of critical care transport.

The standard neonatal or pediatric team consists of:

- *Critical Care Physician
- *Critical Care Transport Nurse
- *Paramedic
- *Pilot or Emergency Medical Technician (EMT)
ambulance driver

Composition of the team for a maternal transport varies, depending on the patient's clinical condition. If delivery is imminent, the transport coordinator may elect to send a neonatal as well as an obstetrical team.

Transport personnel are selected on the basis of their clinical expertise, problem-solving and communication skills, adaptability, and demonstrated ability to function as part of a well-integrated team. All team members are rigorously trained in current transport concepts and techniques. Areas of training and periodic review include:

- *Clinical stabilization guidelines
- *Transport policies and procedures
- *Functioning in a moving environment
- *Operation of specially designed transport equipment
- *Aeromedical physiology
- *Interhospital relations
- *Psychosocial needs of parent/family
- *Medicolegal liability in transport

King-American Ambulance Company owns and maintains the ground ambulances and transport equipment, and provides experienced paramedics

and EMTs to participate in team roles and responsibilities. As team members, paramedics are responsible for equipment operation, freeing transport physicians and nurses for patient care. King-American's Control Center establishes an essential communication link between UCSF and the referring hospital during transit.

Historically, King-American has been in the vanguard in the expanding field of transport technology. In consultation with UCSF, King-American patented the "Mistogen" incubator for babies; similarly, the company developed a fully equipped pediatric "intensive care stretcher" to facilitate medically managed transfer of children. Four Mistogen transport incubators and two pediatric intensive care stretchers assure 24-hour availability to respond to transport requests.

For air transport, King-American furnishes ground ambulance service between UCSF and the Butler Aviation facility (SFO) for fixed-wing air transport and, in coordination with CALSTAR, for helicopter transport. A San Francisco based medical air transport company, Air Ambulance International, provides pilots and a variety of fixed-wing aircraft--six Cessna 414's, two Mitsubishi MU-2's, and a Lear jet--for transports involving distances greater than 100 miles. CALSTAR, a nonprofit public benefit corporation, provides pilots and a twin-engine BK 117 helicopter for distances less than 150 miles. Severity of illness, time en route, climate, and space/pressurization requirements will dictate the use of fixed-wing aircraft or helicopter for a particular transport.

The transport team coordinates all travel arrangements, including ground ambulance service to and from the airport in the referring community. As a company specializing in medical transport,

Air Ambulance International has the authority to request "lifeguard priority" from the Federal Aviation Administration (FAA) to expedite travel in life-threatening emergencies.

Air Ambulance International and CALSTAR aircraft and pilots exceed stringent FAA requirements. Aircraft are scrupulously inspected and maintained, and are custom retrofitted with:

- *Compressed air and medical O₂
- *IV fluid holders
- *115-volt 60-cycle power inverter
- *Adjustable spotlights in cabin
- *Controls for regulating cabin temperature
- *In-flight team-to-hospital radio communication (2-way)

Aircraft cabins allow easy loading and removal of a transport incubator or stretcher with minimal tilting of the patient.

All pilots employed by Air Ambulance International and CALSTAR are Airline Transport Rated. Ongoing training, both in-flight and on the ground, helps preserve this standard of excellence for flight crews. Pilots play a major role in assuring the safety and comfort of patients by utilizing flight techniques consistent with the special needs of airborne medical treatment.

The existence and use of specially designed vehicles and equipment help facilitate transport of patients while ensuring continuity of care. The skilled personnel and their dedicated, efficient teamwork, however, remain the cornerstone of UCSF's Perinatal/Pediatric Transport Service.

TRANSPORT COSTS

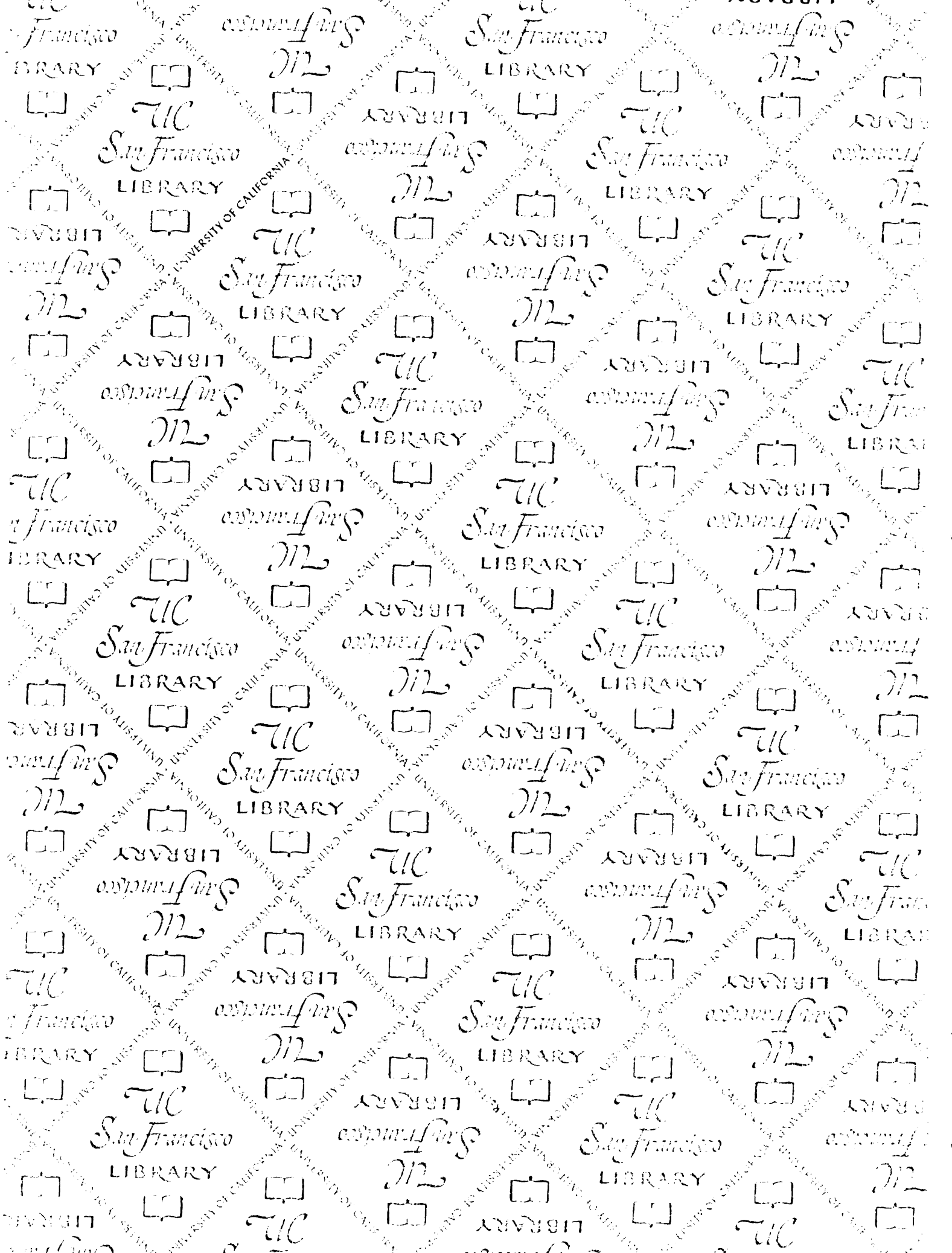
Making technologically advanced medical services available to the entire community of Northern California is a primary goal of UCSF. In keeping with this commitment to quality care, the UCSF Perinatal/Pediatric Transport Service provides critical care transport regardless of a patient's ability to pay.

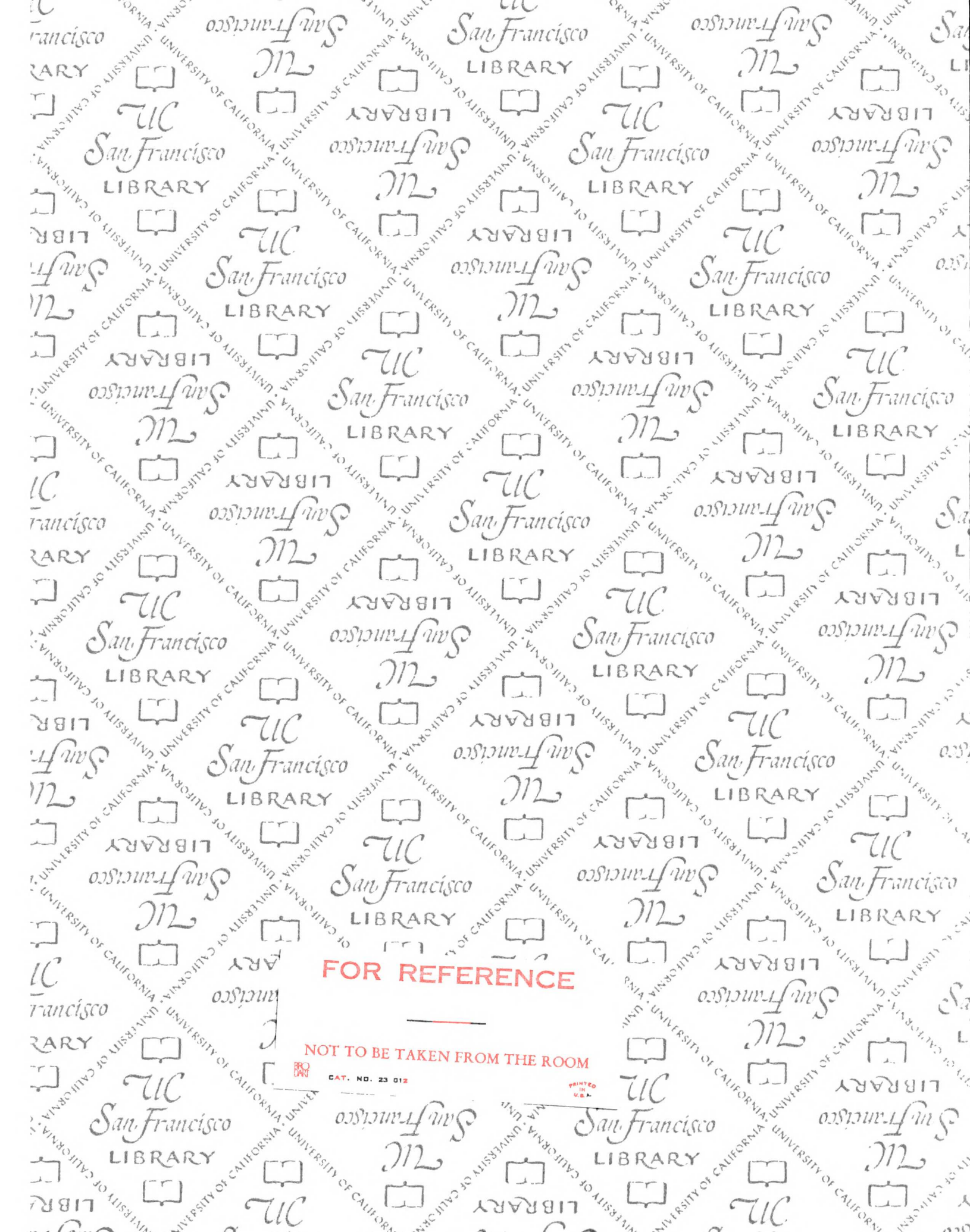
The cost of transport is determined by several factors, including distance and duration of travel, mode of transfer, and composition of the team. Although carrier charges are greater for air than for surface ambulances, air transport's shorter travel time and consequent reduction in medical team expense render it cost-competitive with ground transportation.

Charges incurred during transport are billed separately by UCSF, King-American Ambulance Company, Air Ambulance International, and CALSTAR. Third-party payment for transport services depends on the individual insurance plan. Currently, most major medical policies cover the cost of emergency interhospital transport.

For answers to further questions regarding transport costs or reimbursement, referring personnel may telephone the UCSF transport coordinator at 415/666-5611.

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