

## **Introduction**

Welcome to the Le Bonheur Intensive Care Unit. You about to embark on a four-week excursion into an area of pediatrics which will be slightly different from any other area you have so far explored- -the care of the critically ill child. It will be a long and challenging month, with demanding hours and considerable responsibility, but it will be a month hopefully filled with many learning opportunities and rewarding experiences.

The goals for this rotation include:

1. Learning to evaluate severity of illness
2. Review of pediatric resuscitation
3. Understanding the pathophysiology of life-threatening disease processes
4. Hands-on procedural skills and training
5. Use of pharmacotherapeutic agents in the critical care unit
6. Proficiency in comprehensive patient management.

Remember, you are training to become general pediatricians who will have the occasion to be “first on the scene” with a critically ill child. Becoming familiar with the life-saving equipment, techniques, and treatment plans that you will be exposed to in this rotation will help you to deal with these situations in a competent, organized fashion.

### **The ICU Concept**

The concept of an intensive care unit has evolved to meet the needs of the critically ill patient. It involves the premise that this type of patient is best cared for in a specialized area by a team of professionals who have advanced training in critical diseases, including physicians, nurses, respiratory therapists, social workers, nutritionists, and other paramedical personnel. The intensive care unit has access to a physician team member 24 hours a day, seven days a week. The team is involved in the management of all patients within the unit, although they may not be the primary service of record. Because of their familiarity of each individual patient, the ICU team members are the best coordinators of consultative input, and the best liaisons for parental communication. Since they are the only individuals consistently present in the ICU, they are also responsible for the immediate handling of any emergencies which arise. Finally, the ICU team member is responsible for the establishment of priorities and the triaging of patient care, especially when the physical and personnel resources of the ICU are stressed by a large patient load.

### **The Intermediate Care Unit (IMCU) Concept**

The intermediate care unit (previously called Transitional Care Unit or TCU) was created to provide a centralized location for the care of the technologically dependent child. Currently, it is adjacent to the ICU and is staffed by the same team of physicians, nurses and respiratory therapists. The patients may remain in the IMCU for as long as is necessary to insure recovery from their initial disease processes or to the point when they may be safely discharged to home or long-term care facility. Focus of care in the IMCU includes not only acute medical issues, but also growth and development, occupational and physical therapy, and psychosocial wellness. Parents take an active role in the IMCU and are diligently trained in the day-to-day routines of their children.

## **The Physicians Role in the ICU**

### **The Resident**

The Le Bonheur ICU is staffed by 3-5 residents from the pediatric and medicine-pediatric specialties. Occasionally, residents from other programs (anesthesia, emergency medicine) as well as fourth-year medical students will also rotate through the ICU. The resident will have the greatest responsibility for immediate patient care delivery. All medical patients admitted on the resident's call day require a complete history and physical examination, with appropriate documentation in the chart. Surgical admissions should be examined but should have had their paper work completed by your surgical colleagues prior to arrival. The resident is expected to write daily progress notes on ALL of his or her assigned patients. Progress note forms are available in the ICU.

The resident is expected to be aware of EVERY patient's disease process, respiratory status, hemodynamics and neurologic exam. It is imperative to be informed about changes in your patient's condition which can occur at any time, and to act on these changes appropriately (consulting with the ICU fellow or attending as needed). It is your responsibility to contact consultative services and follow-up on their recommendations, to confirm results of important laboratory and radiographic testing, and to document alterations in course or therapeutic interventions in the chart. As you are a consultative physician for the surgical patients, you can make suggestions on patient management to the surgical fellows.

During emergency situations (airway compromise, cardiopulmonary arrest, vascular access, intracranial pressure elevations) you will be the team leader until more senior members of the ICU team arrive. Make sure the unit secretary calls all appropriate physician services involved with the patient while you manage the emergency. It is the floor resident's responsibility to attend cardiopulmonary arrest calls outside of the ICU/IMCU – you should stay in the ICU.

Resident practice group duties remain unchanged during your ICU rotation. You MUST check out your patient list to a fellow / resident for presentation on the morning or afternoon rounds.

The management experience of critically ill children will constitute the most important component of the house officer's education in the ICU. We encourage you to make independent decisions, especially as your skills and feelings of competence grow. You will, however, never be left without support. The resident is expected to make use of the ICU fellows and attendings to broaden their knowledge base of practical medical care.

### **The ICU Fellow**

All ICU fellows are completing their three-year fellowships in pediatric critical care. Clinically, they will function as rounds leaders, resident supervisors, and procedural skills trainers. There are usually two fellows on service- -one will provide the daily detailed patient care, while the other acts as a troubleshooter during rounds. Both are required to take part in resident bedside and didactic teaching. It is important that you inform the fellow of changes in patient condition, as well as planned admissions and discharges. They should likewise extend this same courtesy to you. They will help you create a treatment strategy for your patients and are available to you at any time for questions or concerns.

As future intensivists, it is important that they be competent and confident in various procedures, so they have precedence for any procedure, even if it is one you have seen or done before- -you may learn a new technique that will work well for you.

### **The ICU Attending**

The ICU attendings are all sub-boarded in pediatric critical care. The function of the attending is to oversee the care of all ICU patients. It is a formal responsibility for all medical patients, and a consultative role for

all surgical patients. The attending provides both bedside and didactic teaching to the students, residents and fellows rotating through the unit. There are usually two staff primarily assigned to the ICU, one responsible for the daily rounds and one an extra pair of hands for ongoing patient needs. The attending MUST be aware of and approve all admissions and discharges to and from the ICU, and must sign progress notes daily. The attending is the only one who can refuse admission of a patient to the intensive care unit. The attending is available at all times to assist residents and fellows in the care of the critically ill patient.

## **Important ICU Personnel**

### **The ICU Charge Nurse**

The ICU charge nurse is a pediatric critical care nurse who has had training in the supervision of his or her colleagues, and who, in combination with the ICU attending, is responsible for the allocation of resources for patient care. He or she is responsible for all pending admissions and discharges, insuring that timely transfers will occur. He or she will aid the bedside nurses in their care routines, and inform the physician staff members of changes in patient status. The ICU charge nurse is an excellent resource for understanding the critically ill child.

### **The Bedside Nurse**

The bedside nurse is assigned one to two patients during a 12 hour shift. It is the responsibility of this nurse to carry out all physicians' orders that are written throughout the shift. The bedside nurse will participate in morning work rounds to update the staff on changes in patient status and to provide valuable input for patient management.

### **The Respiratory Therapist**

Each of the respiratory care professionals in the ICU has advanced training in the care of the critical ill child. They maintain the oxygen delivery systems, mechanical ventilators, invasive pressure monitors (including Swan-Ganz catheters), and aerosolized therapies ordered for our patients. Each patient intervention is documented by the RT in a separate green chart at the bedside. Many are skilled transport therapists as well as ECMO specialists.

### **The ICU Social Worker**

The social worker contributes a valuable service in addressing the psychosocial needs of every patient and family member. When consulted, the social worker will assess the acute and chronic family situation, provide timely and continual crisis counseling, and make appropriate referrals (Department of Human Services, home health, disability, support groups). The social worker attends work rounds if possible, and is available by pager 24 hours a day.

### **The ICU Pharmacist**

The ICU pharmacist is available within the ICU from 0800-2300 weekdays and 0800-1700 weekends. He or she is responsible for accurate dispensation of all drugs given to the ICU patients. The pharmacist

attends work rounds if possible and makes suggestions regarding therapeutic choice, dosing, alternative therapies, and drug interactions.

### **The ICU Nutritionist**

The nutritionist is responsible for surveillance of intensive care patients for factors that place them at risk for nutritional deficiency. She attends work rounds and is available for consultation on all forms of enteral nutrition.

## Necessary Information for Residents

1. As there are many different ventilators with multiple modalities used in the ICU the resident is not allowed to physically change the settings on the machines. The orders for changes may be written in the order sheet. It is then advisable to find a fellow, attending or respiratory therapist to make the timely intervention for you.
2. Use of muscle relaxants for intubation must have either a fellow or attending present during the procedure.
3. All invasive procedures must be cleared by the ICU fellow or attending. If you are planning a procedure please inform the bedside nurse in advance to allow time to gather necessary equipment and personnel. Ensure that a "timeout" is called before proceeding with the procedure. Clean up after yourself. Place all sharps and contaminants in appropriate containers. Complete a procedure note and forward the same to the attending. Reassess the response of your patient to the procedure when you are finished (e.g. check X-ray for central line placement or Endotracheal position etc).
4. Notify the charge nurse of all pending admissions and discharges as soon as you are aware of them.
5. Notify the charge nurse of admissions with special needs, such as mechanical ventilation, isolation protocols, hemodialysis, ECMO, minimal stimulation, etc.
6. Please transcribe transfer order/notes ASAP once a plan for transfer has been formulated and call the admitting medical team in a timely fashion.
7. Computerized orders are the rule. Verbal orders should be reserved for emergency situations and should be transcribed to computer orders ASAP. Inform the bedside nurse of new written orders. If a STAT order is written, inform both the bedside nurse and the unit secretary.
8. Lab work is drawn routinely at 0400, 1000, 1600 and 2200 by the bedside nurse or phlebotomist. Lab ordered at any other time, except drug levels, will evoke a greater patient charge. Labs must be rewritten each day. Please order I-stat tests only when necessary and by using due judgment – remember you can get the same information with a lab sample in a slightly longer time frame.
9. Nurses and respiratory therapists will appreciate anything you can teach them about your patients, and they can frequently teach you if you are wise enough to listen.
10. Parents may visit at any time except during nursing shift change, new admissions, and crisis situations. If you need to talk privately with a family, a small room is available near the secretary's desk. Siblings may visit if authorized by the fellow/attending. Two visitors are allowed at the bedside at a time. In the IMCU, parents are intimately involved in their child's care and can be a great resource for current patient condition.
11. If you don't know how something works - - ASK! There is a lot of expensive equipment in the ICU and you are invited to become familiar with any or all of it. We do request that you ask for assistance, since many of these items are delicate and necessary for patient care.
12. Infection control includes you! Use the appropriate barriers listed on the isolation cards. Wear gloves for blood work, oral care and suctioning. Safety glasses should be worn during suctioning, PALS, and when any risk exists for patient body fluid contact. And, for Pete's sake, wash your hands! It remains the single most effective way to prevent nosocomial infection.

## ICU Routine

The basic schedule for the ICU is as follows:

0600	Resident handoff
0700	Attending & ICU Fellow handoff
0800	X-ray rounds
0830	Work rounds, except Tuesday & Wednesdays (9:00)
1200	Pediatric Resident lecture series
1600	Resident handoff
1630	Attending & ICU Fellow handoff

**Work Rounds** are patient-problem oriented. This will be the time for transfer of essential information between residents and with the ICU staff. All patients will be presented by the resident using a systems approach format. General plans for the day's management will be made and an opportunity will be provided for clinical, patient-directed teaching. The secondary ICU fellow and attending will participate in rounds or move around the unit to troubleshooting areas. It is important not to get bogged down in lengthy discussions that could be better attended to after work rounds are completed. Residents that will be on call during the evening are encouraged to take notes on patient problem lists and pending labs/procedures that may fall to you to check during the evening.

**MRT Consults** are frequently called for acute changes by the floor service. The MRT calls are responded by the PICU charge nurse or a senior nurse assigned to that role. PICU fellows may accompany the RN on the MRT calls. If the patient is deemed to be critical the patient may be transferred to the PICU however should the patient appear stable the PICU team should reassess the patient.

**Handoff rounds** function to inform the ICU team of changes that occurred during the day, newly available data and consultant recommendations, and plan for the evening. Presentations should be brief, with the items your on-call colleague should check and modify as needed.

The **resident lecture series** will occur during the afternoon and will encompass topics which are pertinent to critical care. They are informal discussions and are meant to generate questions relevant to care of the critically ill and dying child. Some of these discussions may be incorporated during the teaching rounds however didactic lecture series will also be held by Attendings / Fellows. You may be asked to review a topic for discussion in advance or prepare a presentation on a particular topic of current interest.

**IMCU patients** are currently followed by the Secondary PICU attending and nurse practitioners. The residents are not required to follow the chronically ventilated children in the IMCU. However, short-term transfers from the ICU awaiting transfer to the floor service should be followed by the resident team in conjunction with the nurse practitioners in the interest of continuity of care. For your interest, the **IMCU care conference** is a weekly arena for the comprehensive assessment of our IMCU patients. It is attended by the IMCU service physicians, pulmonologists, IMCU nursing, IMCU nutritionist, respiratory care, speech pathology, occupational therapy, physical therapy, IMCU social worker, and home health agency representatives. Short and long-term goals for each patient are determined. The weekend coverage for these patients is currently the resident's responsibility. An update for these cases is frequently handed over by the nurse practitioner on Friday evening. The resident's function is to present the brief history, exam, assessment and plan on medical changes in these patients.

All residents are encouraged to attend **pediatric grand rounds** on Wednesday. Either the attending or fellow or nurse practitioner may stay in the unit to provide coverage.