

## University of Tennessee Health Science Center Pediatric Critical Care Medicine Fellowship Program

### *Goals and Objectives*

The goals of the Pediatric Critical Care Medicine Fellowship Program at the University of Tennessee Health Science Center and Le Bonheur Children's Medical Center is ***to provide comprehensive training to pediatricians in the scientific and clinical practice of pediatric critical care medicine***. This training includes those elements which typify an accomplished and well-rounded practitioner, including medical knowledge, clinical skills, judgment, research skills, humanistic qualities and professionalism, and a commitment to scholarship and life-long learning. The specific goals include:

1. ***To provide the trainee with medical knowledge*** in the field of Pediatric Critical Care Medicine, including established and developing scientific knowledge in biomedical, clinical, and cognitive areas, to enable the trainee to function as an expert in the subspecialty, to apply his/her knowledge to clinical care and research questions, and to function as a consultant and resource to other health care professionals.
2. ***To teach the trainee clinical and technical skills*** in Pediatric Critical Care Medicine that will enable the trainee to provide high quality, compassionate, appropriate, and effective patient care. These skills include:
  - a. ***Self-assessment and improvement skills*** enabling the trainee to continually evaluate his/her practice and to assimilate new knowledge.
  - b. ***Communication and interpersonal skills*** facilitating the effective exchange of information with patients, families, and other health professionals.
  - c. ***Professional attitudes*** instilling into the trainee's practice a commitment to professional responsibilities, ethical practice, sensitivity to diverse patients and colleagues, and personal accountability.
  - d. ***Knowledge of the larger context and system of care***, to enable the trainee to provide care of optimal value, appropriately allocate resources, and advocate for quality patient care.
3. ***To provide the trainee with skills and experience in conducting clinical and/or basic science research*** including study design and methods, data collection and analysis, and presentation of findings, such that the trainee will be able to evaluate new findings and to conduct meaningful hypothesis-driven research.
4. ***To provide the trainee with teaching skills*** and to help them understand their role in general residency and medical education and as a resource for other health care professionals.

## Program Goals and Objectives

### *Aims, Educational Strategies, and Assessment*

With each year of training, the fellows will demonstrate increasing levels of medical knowledge, clinical and technical skills, teaching capabilities, and insight into research methods. The aims for each level of training and how we achieve these aims at each level of training within the Pediatric Critical Care Medicine Fellowship Program are outlined below:

#### *1. Medical Knowledge*

**Year 1:** At the completion of the first year of training the trainee will have acquired considerable knowledge in the pathophysiology, diagnosis, and management of common diseases encountered in the intensive care unit, such as respiratory failure, hemodynamic instability, complex congenital heart disease, intracranial hypertension, septic shock, hematologic and oncologic emergencies, solid organ transplant, renal failure, liver failure, trauma, and fluid and electrolyte disturbances, as well as some knowledge of more uncommon problems in highly specialized areas such as neuro-intensive care and cardiovascular intensive care, and begin to apply this knowledge in patient care and consultant roles.

**Year 2:** At the completion of the second year of training, through additional inpatient training, on-call experience, and conferences the trainee will have acquired extensive knowledge of the etiology, pathophysiology, diagnosis, and management of common diseases encountered in the intensive care unit, and considerable knowledge of more uncommon problems in highly specialized areas of critical care medicine, and will demonstrate that he/she can consistently apply this knowledge in patient care and consultant roles, and will begin to apply this knowledge to research questions.

**Year 3:** At the completion of the third year of training the trainee will have acquired the knowledge specified in the content outline of the Sub-Board of Pediatric Critical Care Medicine of the American Board of Pediatrics for the subspecialty qualifying examination and will routinely apply this knowledge in patient care, consultative roles, and research endeavors.

#### *Educational strategies for medical knowledge:*

Medical knowledge will be provided to trainees through clinical rotations, conferences, special courses, printed materials, and through other media such as web-based educational sites.

#### *Clinical rotations*

1. On-service rotations as primary fellow with critical care attending, approximately 10-12 weeks/year for years 1 and 2 and 4-8 weeks for year 3.
2. On-call nights are approximately every other 4<sup>th</sup> night and average to 8 calls per 28 day block while on-service.

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3. Evaluation of patients in the Emergency Department and consultation on in-patients on the general pediatric ward while on-service and on-call. This is not to interfere with the management of patients in the Pediatric Intensive Care Unit.
4. 1 x 4 week rotation on the cardiovascular surgery service in each of the 3 years of the training program. Co-management of the cardiovascular surgery patients while on-service and on-call. On-call responsibilities are in the PICU 3-5 times during that period.
5. 1 x 4 week rotation on the anesthesiology service during the 1<sup>st</sup> year. On-call responsibilities are in the PICU 3-5 times during that period.
6. 1 x 4 week rotation in the Transitional Care Unit during the 1<sup>st</sup> year. On-call responsibilities are in the PICU 3-5 times during that period.
7. 1 x 4 week rotation in the Intensive Care Unit at St. Jude Children's Research Hospital in each of the 3 years. On-call responsibilities are every 3<sup>rd</sup> night not to exceed 9 calls within the 28 day block.

### *Conferences*

1. Noon conferences on Monday and Friday. These will include the core curriculum didactic sessions, journal clubs, research conferences, morbidity and mortality conferences, case reviews, and board review sessions.
2. Weekly Department of Pediatrics Grand Rounds
3. Weekly cardiac catheterization conference while on-service for the ICU or the cardiovascular surgery services.
4. Monthly Bereavement Conference
5. Attendance at national meeting; eg, Society of Critical Care Medicine, Pediatric Critical Care Colloquium, American Thoracic Society, or Academic Pediatric Societies.

### *Educational Materials*

1. Pediatric Critical Care textbooks, including Fuhrman and Zimmerman, and Rogers
2. Basic physiology textbooks, including West (pulmonary physiology) and additional textbooks, such as the Nichols Text of Congenital Heart Disease
3. Journal club articles, access to divisional journal resources
4. Web-based learning experiences

### *Assessment*

1. 360 evaluations of the trainee
2. Subspecialty in-training examination
3. Content of trainee presentations
4. Self-assessment

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### **2. *Clinical and Technical Skills***

**Year 1:** At the completion of the first year of training the trainee will be able to obtain a complete history, perform a thorough and accurate physical examination, diagnose and formulate management plans for the most common medical problems in the field of Pediatric Critical Care Medicine with some supervision from faculty; this is to include all aspects of supported ventilation, pharmacologic support of hemodynamics, support of fluid balance and nutrition, management of intracranial hypertension, resuscitation, pharmacology and clinical action of commonly used anesthetics, sedatives, and muscle relaxants, and postoperative management of cardiovascular surgery patients; will identify indications for placement of central venous lines or arterial lines, chest tubes, intubations, and other procedures; will state the risks for the various procedures and each type/site of CVL and alternatives to the anticipated procedure; identify high-risk patients; describe how to set up the operative site and list the materials which will be needed; demonstrate appropriate positioning of patient and identify landmarks for intubations, and placement of CVL and arterial lines; demonstrate skill with maintaining the airway and bag/mask ventilation; demonstrate appropriate sterile technique; demonstrate adequate use of pain control and sedation during a procedure; demonstrate basic skills in intubations, placing lines and other common procedures; assessing the proper endotracheal tube position or line position, and securing the endotracheal tube or line; identify indications for extubation or removal of the line including malfunction, infection, or resolution of the clinical indication for the line; document and appropriate procedure note for the patient medical record; will be able to direct discussions during work rounds with some input from the faculty; will be able to prioritize initial stabilization needs with some input from the faculty; will be able to participate in discussion regarding indications for PICU admission and management of PICU patient flow; and will demonstrate a commitment to high standards of professionalism, including self-directed learning, honesty, effective communication with patients and colleagues; and sensitivity.

**Year 2:** At the completion of the second year of training the trainee will be clinically competent in diagnosing and formulating management plans for the most common problems encountered in the field of Pediatric Critical Care Medicine, and will be able to diagnose and manage more uncommon problems with some supervision from faculty; will be able to achieve a high level of success with common procedures and appropriately consult with attending for difficult procedures; will be able to guide discussions during work rounds with minimal input from faculty; will be able to actively participate in management of PICU patient flow; and will continue to develop personal benchmarks by which to measure one's professional growth.

**Year 3:** At the completion of the third year of training the trainee will be clinically competent to independently manage the most common medical problems in the field of Pediatric Critical Care Medicine and some of the more uncommon or highly specialized problems; will be able to manage other rare or highly specialized problems with collaboration from faculty/colleagues; will be able to run work rounds independently; directly supervise residents and junior fellows performing common procedures; and will have consistently demonstrated high standards of professionalism.

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### ***Educational strategies for clinical and technical skills:***

Clinical and technical skills will be provided to trainees through clinical rotations, direct supervision by faculty or senior level fellow, conferences, special courses, printed materials, and through other media such as web-based educational sites.

#### ***Clinical rotations***

1. On-service rotations as primary fellow with critical care attending, approximately 10-12 weeks/year for years 1 and 2 and 4-8 weeks for year 3.
2. On-call nights are approximately every other 4<sup>th</sup> night and average to 8 calls per 28 day block while on-service.
3. Evaluation of patients in the Emergency Department and consultation on in-patients on the general pediatric ward while on-service and on-call. This is not to interfere with the management of patients in the Pediatric Intensive Care Unit.
4. 1 x 4 week rotation on the cardiovascular surgery service in each of the 3 years of the training program. Co-management of the cardiovascular surgery patients while on-service and on-call. On-call responsibilities are in the PICU 3-5 times during that period.
5. 1 x 4 week rotation on the anesthesiology service during the 1<sup>st</sup> year. On-call responsibilities are in the PICU 3-5 times during that period.
6. 1 x 4 week rotation in the Transitional Care Unit during the 1<sup>st</sup> year. On-call responsibilities are in the PICU 3-5 times during that period.
7. 1 x 4 week rotation in the Intensive Care Unit at St. Jude Children's Research Hospital in each of the 3 years. ON-call responsibilities are every 3<sup>rd</sup> night not to exceed 9 calls within the 28 day block.

#### ***Conferences***

1. Noon conferences every Monday and Friday. These will include the core curriculum didactic sessions, journal clubs, research conferences, morbidity and mortality conferences, case reviews, and board review sessions.
2. Weekly Department of Pediatrics Grand Rounds
3. Weekly cardiac catheterization conference while on-service for the ICU or the cardiovascular surgery services.
4. Monthly Bereavement Conference
5. Attendance at national meeting; eg, Society of Critical Care Medicine, Pediatric Critical Care Colloquium, American Thoracic Society, or Academic Pediatric Societies.

#### ***Educational Materials***

1. Educational materials are the same as those for the medical knowledge section.

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### *Assessment*

1. 360 evaluations of the trainee
2. Subspecialty in-training examination
3. Content of trainee presentations
4. Self-assessment
5. Chart reviews
6. Procedure log

### **3. *Teaching Skills***

**Year 1:** At the completion of the first year of training, through an emphasis on clinical work and the beginning of a research experience, the trainee should be a valuable teacher of critical care knowledge, clinical skills, communication skills, professional attitudes, the health care system, and technical skills, to medical students, residents, other trainees, and other healthcare professionals, under direct supervision of critical care faculty.

**Year 2:** At the completion of the second year of training the trainee should be a valuable teacher of critical care knowledge, clinical skills, communication skills, professional attitudes, the health care system, and technical skills, to medical students, residents, other trainees, and other healthcare professionals, with some supervision of critical care faculty.

**Year 3:** At the completion of the third year of training the trainee should be a valuable and skilled teacher of critical care knowledge, clinical skills, communication skills, professional attitudes, the health care system, technical skills, and research skills including study design, methodology, data collection, and analysis to medical students, residents, other trainees, other healthcare professionals and critical care faculty.

### ***Educational strategies for teaching skills:***

Educational strategies to teach trainees teaching skills include formal presentations and informal teaching opportunities.

#### ***Formal presentations***

1. Formal presentations during divisional teaching conferences
2. Formal presentations to residents
3. Formal presentations in nursing orientation program
4. Fellows are encouraged to participate in Pediatric Advanced Life Support as instructors

#### ***Informal presentations***

1. Teaching during work rounds while on-service under the supervision of faculty to residents, nurses, and other members of the multidisciplinary healthcare team.

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2. Teaching one-on-one with house staff throughout the day and while on call.

### ***Assessment***

1. 360 evaluations of the trainee
2. Content of trainee presentations
3. Self-assessment

### **4. *Research Skills***

***Year 1:*** By the end of the first year of training the trainee will select a primary research focus in either clinical research or basic science bench research; will develop a hypothesis-driven question with the research advisor; will begin developing an understanding of the literature surrounding his/her project and the techniques required to implement the work; will begin to understand the various types of study design and research methods; will be able to describe types of data and data collection, and will have some familiarity with statistical tests; will be able to interpret published findings; and will be familiar with issues surrounding protection of human subjects, informed consent, and submission to the Institutional Review Board.

***Year 2:*** At the completion of the second year of training the trainee will have developed his/her project and actively conducted the appropriate experiments; will have generated usable data and may have reported these findings in abstract or publication form; will have considerable familiarity with types of data and data collection and with statistical tests; and will be able to independently summarize published findings in a journal club format.

***Year 3:*** At the completion of the third year of training, the trainee will report his/her hypothesis-driven research results and will be familiar with the process of multi-institutional collaborative research in the critical care field.

### ***Educational strategies for research skills:***

Research skills will be developed through the following means:

#### ***Research project:***

1. Identification of a specific research project under the mentorship of an appropriate faculty member. This mentor will generally be on faculty at the University of Tennessee Health Science Center or St. Jude Children's Research Hospital.
2. Participation in multi-institutional collaborative research when appropriate.

#### ***Conferences***

1. Weekly PICU staff meeting, where potential multi-institutional studies are occasionally discussed.

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2. Weekly fellowship core curriculum didactic session.
3. Monthly divisional journal club/research conference.
4. Research updates through the Children's Foundation of Memphis Research Center sessions (1/month) – under the direction of Dr. Dennis Black.
5. Didactic sessions covering such as bioethics, biostatistics, grant preparation, involvement of human subjects in medical research, etc.
6. Attendance at one or more national meetings (typically Society of Critical Care Medicine, Pediatric Critical Care Colloquium, American Thoracic Society, or Academic Pediatric Societies).

### ***Assessment:***

1. 360 evaluations of the trainee including the research mentor
2. Presentation of work-in-progress to the faculty
3. Presentation of results as applicable at national meetings
4. Publication of results in a peer-reviewed journal
5. Self-assessment

## **PICU Rotation**

### ***Patient care:***

1. *Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families*
  - a. The PICU fellow will explain the plan for the day with the family and discuss with them with any significant changes in the condition of their child or the plan.
2. *Gather essential and accurate information about their patients*
  - b. The PICU fellow will obtain and record a daily interim history, physical exam, and laboratory information in preparation for morning rounds either on their own or with the aid of other members of the multidisciplinary healthcare team.
3. *Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment.*
  - c. The PICU fellow will state a plan for diagnostic and therapeutic interventions for each patient using clinical judgment and literature evidence.
4. *Develop and carry out patient management plans*
  - d. The PICU fellow will develop and carry out the patient management plans and state the results of those interventions to the team during afternoon rounds.
5. *Counsel and educate patients and their families*
  - e. The PICU fellow will explain the plan for the day with the family and update them with any significant changes in the condition of their child or the plan.

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6. *Use information technology to support patient care decisions and patient education*
  - f. The PICU fellow will gather recent literature from internet sources supporting elements of the patient care plan and explain how the literature supports these elements to the rounding team.
7. *Perform competently all medical and invasive procedures considered essential for the area of practice*
  - g. The PICU fellow will perform intubations, central venous and arterial access, conscience sedation, pericardiocentesis, thoracentesis, lumbar punctures, and chest tubes on patients.
8. *Provide health care services aimed at preventing health problems or maintaining health*
  - h. Not applicable in this setting with this group of patients.
9. *Work with health care professionals, including those from other disciplines, to provide patient-focused care*
  - i. The PICU fellow will seek out recommendations from consulting and co-managing services, integrate these recommendations into the overall patient care plan, and explain these recommendations to the rounding attending.

**Medical knowledge:** Fellows must demonstrate knowledge about established and evolving biomedical, clinical, and cognate (e.g. epidemiological and social-behavioral) sciences and the application of this knowledge to patient care.

1. *Demonstrate an investigatory and analytic thinking approach to clinical situations*
  - a. The PICU fellow will be able to identify the following clinical situations, their evaluation, and state the appropriate clinical management:
    - i. Respiratory distress and failure
    - ii. Upper versus lower airway respiratory failure
    - iii. Sepsis and septic shock
    - iv. Low cardiac output state
    - v. Pericardial effusion and tamponade
    - vi. Pulmonary hypertension
    - vii. Cyanosis
    - viii. Pulmonary edema
    - ix. Pneumothorax
    - x. Pericardial effusion/tamponade
    - xi. Myocardial ischemia
    - xii. Acute respiratory distress syndrome
    - xiii. Dysrhythmias
    - xiv. Anaphylactic shock and allergic reactions to medications
    - xv. Altered mental status, coma
    - xvi. Increased intracranial pressure
    - xvii. Intracerebral hemorrhage/stroke
    - xviii. Poisonings and overdoses

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- xix. Hyperthermia/hypothermia
- xx. Seizures
- xxi. Withdrawal from narcotics
- xxii. ICU psychosis
- xxiii. Metabolic encephalopathies
- xxiv. Gastrointestinal hemorrhage
- xxv. Hepatic failure
- xxvi. Abdominal distension
- xxvii. Coagulopathies
- xxviii. Renal insufficiency/failure
- xxix. Pain and anxiety in the muscle relaxed patient
- xxx. Brain death

2. *Know and apply the basic and clinically supportive sciences which are appropriate to their discipline*
- a. The PICU fellow will be able to state the anatomy, physiology, pathophysiology, pharmacology, and management for each of the following:
    - i. Asthma
    - ii. Bronchiolitis
    - iii. Pneumonia/pneumonitis
    - iv. Upper airway obstruction (croup, epiglottitis, subglottic stenosis, retropharyngeal abscess, etc)
    - v. Pulmonary contusion
    - vi. Necrotizing enterocolitis
    - vii. Peritonitis
    - viii. Meningitis/encephalitis
    - ix. Intracranial hemorrhage
    - x. Veno-occlusive disease
    - xi. Graft vs host disease
  - b. The PICU fellow will read and interpret radiographs performed in the PICU setting and recognize and discuss the appropriate management of the following common radiographic findings:
    - i. Pleural effusion
    - ii. Pericardial effusion
    - iii. Pneumothorax
    - iv. Hemothorax
    - v. Pneumomediastinum
    - vi. Subcutaneous emphysema
    - vii. Pneumonia/pneumonitis
    - viii. Atelectasis
    - ix. Hyperinflation
    - x. Paralyzed diaphragm
  - c. The PICU fellow will interpret head computerized tomographies performed on patients in the PICU setting and recognize the following clinical conditions:

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- i. Diffuse axonal injury
- ii. Subdural, subarachnoid, epidural hemorrhage
- iii. Hypoxic/ischemic injury
- iv. Hydrocephalus

***Practice-based learning and improvement:*** Residents must be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices.

1. *Analyze practice experience and perform practice-based improvement activities using a systematic methodology*
  - a. The PICU fellow will review 1 case per 6 month period as a chart review in the presence of a Division faculty member.
2. *Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems*
  - a. The PICU fellow will conduct 1 journal article review per 6 month period to be presented to and evaluated by the Division faculty
  - b. The PICU fellow will cite specific published literature to support their care plans.
3. *Obtain and use information about their own population of patients and the larger population from which their patients are drawn*
  - a. The PICU fellow will discuss pertinent epidemiological studies by investigators in the Department of Pediatrics at the University of Tennessee Health Science Center. For example, discuss antibiotic resistance patterns in the city of Memphis.
4. *Apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness*
  - a. The PICU fellow will conduct 1 journal article review per 6 month period to be presented to and evaluated by the Division faculty with particular focus in discussion on study design and statistical methods.
5. *Use information technology to manage information, access on-line medical information, and support their own education*
  - a. The PICU fellow will show to the faculty their ability to perform on-line literature searches to support their patient care decisions and they will present those searches to the rounding team.
6. *Facilitate the learning of students and other health care professionals*
  - a. The PICU fellow will conduct 1 didactic presentation on a PICU topic of their choice to the PICU multidisciplinary health care team.

***Interpersonal and communication skills:*** Fellows must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their patients families, and professional associates.

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1. *Create and sustain a therapeutic and ethically sound relationship with patients*
  - a. The PICU fellow will explain the plan for the day with the family and discuss with them any significant changes in the condition of their child or the plan.
2. *Use effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills*
  - b. The PICU fellow will answer any questions and discuss any concerns the family raises in regards to their child.
3. *Work effectively with others as a member or leader of a health care team or other professional group*
  - c. The PICU fellow rotating in the PICU will participate in morning cardiovascular surgery rounds and incorporate discussions from other members of the health care team (for example, nursing, respiratory therapy, pharmacy, nutrition service) into the daily care plan. He/she will call other physicians involved in the care of the patients in the PICU and discuss the care plan with them. He/she will also call physicians from whom consultations are requested to discuss the issues to be addressed.

**Professionalism:** Fellows must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

1. *Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supercedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and ongoing professional development*
  - a. The PICU fellow will read the American College of Physicians Ethics Manual and discuss one section in a Division conference. The manual is available at: <http://www.acponline.org/ethics/ethicman.htm#alloc>. The fellow will also be observed for demonstration of respect, compassion, integrity; a responsiveness to the needs of patients and society that supercedes self-interest, accountability to patients, society, and the profession, and a commitment to excellence and ongoing professional development during daily contact with the faculty.
2. *Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices*
  - b. The PICU fellow will attend the University of Tennessee Health Science Center systems-based lecture series on confidentiality, informed consent, and business practices.
  - c. The PICU fellow will participate in the Bereavement conferences and discuss end of life issues with the health care team.
  - d. The PICU fellow will pass the University of Tennessee Health Science Center course on HIPPA.

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- e. The PICU fellow will read the American College of Physicians Ethics Manual and discuss one section in a Division conference. The manual is available at: <http://www.acponline.org/ethics/ethicman.htm#alloc>.
- 3. *Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities*
  - f. The PICU fellow will participate in the Bereavement conferences and discuss end of life issues with the health care team.
  - g. The PICU fellow will develop and carry out the patient management plans and state the results of those interventions to the multidisciplinary health care team during afternoon rounds, will explain the plan for the day with the multidisciplinary health care team and family and update them with any significant changes in the condition of their child or the plan. Observation by the faculty will focus in part on the ability of the PICU fellow to discuss these issues in a sensitive manner that is responsive to the patients' culture, age, gender, and disabilities.

***Systems-based practice:*** Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.

- 1. *Understand how their patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice*
  - a. The PICU fellow will participate in the PediFlite Critical Care Transport team as the physician team member. He/she will travel to rural and small city community hospitals in order to stabilize and transport the child back to Le Bonheur Children's Medical Center. He/she will have a first hand opportunity to observe other health care organizations, interact directly with other physicians in the larger community, and become aware of the larger health care system in this part of the United States.
  - b. The PICU fellow will contact by phone referring physicians to provide follow-up and feedback regarding their patients.
  - c. The PICU fellow will attend the University of Tennessee Health Science Center systems-based lecture series on health care organizations.
- 2. *Know how types of medical practice and delivery systems differ from one another, including methods of controlling health care costs and allocating resources*
  - a. The PICU fellow will attend the University of Tennessee Health Science Center systems-based lecture series on types of medical practices, delivery systems, and health care organizations. The PICU fellow will have the opportunity to attend 1 national meeting per year where discussions with other trainees and pediatric critical care practitioners will allow the fellow to explore these various practice and delivery patterns.

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3. *Practice cost-effective health care and resource allocation that does not compromise quality of care*
  - a. The PICU fellow as the leader of the multidisciplinary health care team will state a plan for diagnostic and therapeutic interventions for each patient using a cost-effective manner. He/she will compare the costs of specific diagnostic and therapeutic interventions, costs that can be obtained from various administrative offices of Le Bonheur Children's Medical Center. For example, the costs of specific laboratory tests can be obtained from the laboratory administration office.
  - b. The PICU fellow as the leader of the multidisciplinary health care team will state a plan for resource allocation at times when the number of patients exceeds the number of physical bed spaces in the PICU without compromising the quality of care for the most critically ill of the patients.
  
4. *Advocate for quality patient care and assist patients in dealing with system complexities*
  - a. The PICU fellow will develop and carry out the patient management plans and state the results of those interventions to the team during afternoon rounds. He/she will be the leader of the multidisciplinary health care team and, as such, will advocate for the best care for their patient.
  - b. The PICU fellow will explain the plan for the day with the family and discuss with them with any significant changes in the condition of their child or the plan. He/she will answer any questions, discuss any concerns the family raises in regards to their child, and discuss with members of the Department of Medical Social Work any issues in which system complexities are of a concern to the family.
  
5. *Know how to partner with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance*
  - a. The PICU fellow will develop and carry out a discharge plan in coordination with the Discharge Planner and the Medical Social Worker in the Transitional Care Unit for the care of technology-dependent children. These plans will require coordination with health care managers and home health care providers for the care of these high-risk patients.
  - b. The PICU fellow will discuss and coordinate the transfer of children to other tertiary care centers that may be able to provide specialized care that the University of Tennessee Health Science Center does not or cannot provide.

## **CV Surgery Rotation**

### ***Patient care:***

1. *Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families*

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- j. The PICU fellow will explain the plan for the day with the family and discuss with them with any significant changes in the condition of their child or the plan.
2. *Gather essential and accurate information about their patients*
  - k. The PICU fellow will obtain and record a daily interim history, physical exam, and laboratory information in preparation for morning rounds.
3. *Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment.*
  - l. The PICU fellow will state a plan for diagnostic and therapeutic interventions for each patient using clinical judgment and literature evidence.
4. *Develop and carry out patient management plans*
  - m. The PICU fellow will develop and carry out the patient management plans and state the results of those interventions to the team during afternoon rounds.
5. *Counsel and educate patients and their families*
  - n. The PICU fellow will explain the plan for the day with the family and update them with any significant changes in the condition of their child or the plan.
6. *Use information technology to support patient care decisions and patient education*
  - o. The PICU fellow will gather recent literature from internet sources supporting elements of the patient care plan and explain how the literature supports these elements to the rounding team.
7. *Perform competently all medical and invasive procedures considered essential for the area of practice*
  - p. The PICU fellow, at the discretion of the CV attending, will perform intubations, central venous and arterial access, conscience sedation, pericardiocentesis, thoracentesis, lumbar punctures, and chest tubes on patients.
8. *Provide health care services aimed at preventing health problems or maintaining health*
  - q. Not applicable in this setting with this group of patients.
9. *Work with health care professionals, including those from other disciplines, to provide patient-focused care*
  - r. The PICU fellow will seek out recommendations from consulting and co-managing services, integrate these recommendations into the overall patient care plan, and explain these recommendations to the rounding attending.

**Medical knowledge:** Fellows must demonstrate knowledge about established and evolving biomedical, clinical, and cognate (e.g. epidemiological and social-behavioral) sciences and the application of this knowledge to patient care.

1. *Demonstrate an investigatory and analytic thinking approach to clinical situations*

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- d. The PICU fellow will be able to identify the following clinical situations and state the appropriate clinical management:
  - i. Pericardial effusion and tamponade
  - ii. Low cardiac output state
  - iii. Pulmonary hypertension
  - iv. Inflammatory heart disease
  - v. Infective endocarditis
  - vi. Cardiomyopathies
  - vii. Neurologic consequences of cardiopulmonary bypass
  - viii. Coagulation disorders following cardiopulmonary bypass
2. *Know and apply the basic and clinically supportive sciences which are appropriate to their discipline*
  - e. The PICU fellow will be able to state the anatomy, physiology, surgical procedure, and peri-operative management for each of the following congenital and acquired heart lesions:
    - i. ASD
    - ii. VSD
    - iii. Atrioventricular canal
    - iv. Double-outlet right ventricle, double-outlet left ventricle
    - v. Aortic stenosis
    - vi. Mitral valve disease
    - vii. Tetralogy of Fallot and pulmonary atresia with VSD
    - viii. Tricuspid atresia and the Fontan operation
    - ix. Hypoplastic left heart syndrome
    - x. Hypoplastic right heart syndrome
    - xi. Coarctation of the aorta and interrupted aortic arch
    - xii. Transposition of the Great Vessels
    - xiii. Total Anomalous Pulmonary Venous Return
    - xiv. Anomalous Coronary Artery
    - xv. Truncus arteriosus
    - xvi. Pulmonary valve disease
    - xvii. Ebstein's anomaly
  - f. The PICU fellow will read and interpret electrocardiograms performed in the PICU setting, recognize and discuss the appropriate management of the following common pediatric rhythm disturbances:
    - i. Ventricular tachycardia
    - ii. Ventricular fibrillation
    - iii. Atrial fibrillation
    - iv. Junctional ectopic tachycardia and flutter
    - v. Conduction abnormalities
    - vi. Supraventricular tachycardia

## Program Goals and Objectives

- g. The PICU fellow will interpret electrocardiograms performed on patients in the PICU setting and recognize the following clinical conditions and defects by echocardiography:
  - i. Pericardial effusion
  - ii. Overall cardiac function
  - iii. Pulmonary hypertension
  - iv. Septal defects
  - v. Coarctation of the aorta
  - vi. Transposition of the great vessels
  - vii. Hypoplastic left and right heart
  - viii. Truncus arteriosus
  - ix. Tricuspid atresia

***Practice-based learning and improvement:*** Fellows must be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices.

1. *Analyze practice experience and perform practice-based improvement activities using a systematic methodology*
  - a. The PICU fellow will review 1 case per 6 month period as a chart review in the presence of a Division faculty member.
2. *Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems*
  - a. The PICU fellow will conduct 1 journal article review per 6 month period to be presented to and evaluated by the Division faculty
  - b. The PICU fellow will cite specific published literature to support their care plans.
3. *Obtain and use information about their own population of patients and the larger population from which their patients are drawn*
  - a. The PICU fellow will discuss pertinent epidemiological studies by investigators in the Department of Pediatrics at the University of Tennessee Health Science Center. For example, discuss antibiotic resistance patterns in the city of Memphis.
4. *Apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness*
  - a. The PICU fellow will conduct 1 journal article review per 6 month period to be presented to and evaluated by the Division faculty with particular focus in discussion on study design and statistical methods.

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5. *Use information technology to manage information, access on-line medical information, and support their own education*
  - a. The PICU fellow will demonstrate their ability to perform on-line literature searches to support their patient care decisions and they will present those searches to the rounding PICU attending.
6. *Facilitate the learning of students and other health care professionals*
  - a. The PICU fellow will conduct 1 didactic presentation on a PICU topic of their choice to the PICU multidisciplinary health care team.

***Interpersonal and communication skills:*** Fellows must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their patients' families, and professional associates.

1. *Create and sustain a therapeutic and ethically sound relationship with patients*
  - d. The PICU fellow will explain the plan for the day with the family and discuss with them any significant changes in the condition of their child or the plan.
2. *Use effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills*
  - e. The PICU fellow will answer any questions and discuss any concerns the family raises in regards to their child.
3. *Work effectively with others as a member or leader of a health care team or other professional group*
  - f. The PICU fellow rotating on the cardiovascular surgery service will lead and participate in morning cardiovascular surgery rounds and incorporate discussions from other members of the health care team (for example, nursing, respiratory therapy, pharmacy, nutrition service) into the daily care plan.

***Professionalism:*** Fellows must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

1. *Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supercedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and ongoing professional development*
  - h. The PICU fellow will read the American College of Physicians Ethics Manual and discuss one section in a Division conference. The manual is available at: <http://www.acponline.org/ethics/ethicman.htm#alloc>. The fellow will also be observed for demonstration of respect, compassion, integrity; a responsiveness to the needs of patients and society that supercedes self-interest, accountability to patients, society, and the profession, and a commitment to excellence and ongoing professional development during daily contact with the faculty.

## Program Goals and Objectives

2. *Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices*
  - i. The PICU fellow will attend the University of Tennessee Health Science Center systems-based lecture series on confidentiality, informed consent, and business practices.
  - j. The PICU fellow will participate in the Bereavement conferences and discuss end of life issues with the health care team.
  - k. The PICU fellow will pass the University of Tennessee Health Science Center course on HIPPA.
  - l. The PICU fellow will read the American College of Physicians Ethics Manual and discuss one section in a Division conference. The manual is available at: <http://www.acponline.org/ethics/ethicman.htm#alloc>.
3. *Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities*
  - m. The PICU fellow will participate in the Bereavement conferences and discuss end of life issues with the health care team.
  - n. The PICU fellow will develop and carry out the patient management plans and state the results of those interventions to the multidisciplinary health care team during afternoon rounds, will explain the plan for the day with the multidisciplinary health care team and family and update them with any significant changes in the condition of their child or the plan. Observation by the faculty will focus in part on the ability of the PICU fellow to discuss these issues in a sensitive manner that is responsive to the patients' culture, age, gender, and disabilities.

***Systems-based practice:*** Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.

1. *Understand how their patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice*
  - a. The PICU fellow will participate in the PediFlite Critical Care Transport team as the physician team member. He/she will travel to rural and small city community hospitals in order to stabilize and transport the child back to Le Bonheur Children's Medical Center. He/she will have a first hand opportunity to observe other health care organizations, interact directly with other physicians in the larger community, and become aware of the larger health care system in this part of the United States.
  - b. The PICU fellow will contact by phone referring physicians to provide follow-up and feedback regarding their patients.
  - c. The PICU fellow will attend the University of Tennessee Health Science Center systems-based lecture series on health care organizations.

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2. *Know how types of medical practice and delivery systems differ from one another, including methods of controlling health care costs and allocating resources*
  - a. The PICU fellow will attend the University of Tennessee Health Science Center systems-based lecture series on types of medical practices, delivery systems, and health care organizations. The PICU fellow will have the opportunity to attend 1 national meeting per year where discussions with other trainees and pediatric critical care practitioners will allow the fellow to explore these various practice and delivery patterns.
3. *Practice cost-effective health care and resource allocation that does not compromise quality of care*
  - a. The PICU fellow as the leader of the multidisciplinary health care team will state a plan for diagnostic and therapeutic interventions for each patient using a cost-effective manner. He/she will compare the costs of specific diagnostic and therapeutic interventions, costs that can be obtained from various administrative offices of Le Bonheur Children's Medical Center. For example, the costs of specific laboratory tests can be obtained from the laboratory administration office.
  - b. The PICU fellow as the leader of the multidisciplinary health care team will state a plan for resource allocation at times when the number of patients exceeds the number of physical bed spaces in the PICU without compromising the quality of care for the most critically ill of the patients.
4. *Advocate for quality patient care and assist patients in dealing with system complexities*
  - a. The PICU fellow will develop and carry out the patient management plans and state the results of those interventions to the team during afternoon rounds. He/she will be the leader of the multidisciplinary health care team and, as such, will advocate for the best care for their patient.
  - b. The PICU fellow will explain the plan for the day with the family and discuss with them with any significant changes in the condition of their child or the plan. He/she will answer any questions, discuss any concerns the family raises in regards to their child, and discuss with members of the Department of Medical Social Work any issues in which system complexities are of a concern to the family.
5. *Know how to partner with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance*
  - a. The PICU fellow will develop and carry out a discharge plan in coordination with the Discharge Planner and the Medical Social Worker in the Transitional Care Unit for the care of technology-dependent children. These plans will require coordination with health care managers and home health care providers for the care of these high-risk patients.

## Program Goals and Objectives

- b. The PICU fellow will discuss and coordinate the transfer of children with congenital heart disease to other tertiary care centers that may be able to provide specialized care that the University of Tennessee Health Science Center does not or cannot provide.

### **TCU Rotation**

#### ***Patient care:***

1. *Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families*
  - s. The PICU fellow will explain the plan for the day with the family and discuss with them any significant changes in the condition of their child or the plan.
2. *Gather essential and accurate information about their patients*
  - t. The PICU fellow will obtain and record a daily interim history, physical exam, and laboratory information in preparation for morning rounds either on their own or with the aid of other members of the multidisciplinary healthcare team.
3. *Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment.*
  - u. The PICU fellow will state a plan for diagnostic and therapeutic interventions for each patient using clinical judgment and literature evidence.
4. *Develop and carry out patient management plans*
  - v. The PICU fellow will develop and carry out the patient management plans and state the results of those interventions to the team during afternoon rounds.
5. *Counsel and educate patients and their families*
  - w. The PICU fellow will explain the plan for the day with the family and update them with any significant changes in the condition of their child or the plan.
6. *Use information technology to support patient care decisions and patient education*
  - x. The PICU fellow will gather recent literature from internet sources supporting elements of the patient care plan and explain how the literature supports these elements to the rounding team.
7. *Perform competently all medical and invasive procedures considered essential for the area of practice*
  - y. The PICU fellow will perform intubations, central venous and arterial access, conscience sedation, pericardiocentesis, thoracentesis, lumbar punctures, and chest tubes on patients.
8. *Provide health care services aimed at preventing health problems or maintaining health*
  - z. The PICU fellow along with other members of the health care team will provide necessary immunizations. He/she will call the patient's primary care provide to keep

## Program Goals and Objectives

them up-to-date on the patient's condition and prepare the primary care provider information relevant to the continuity of care for these technology dependent children.

9. *Work with health care professionals, including those from other disciplines, to provide patient-focused care*
  - aa. The PICU fellow will seek out recommendations from consulting and co-managing services, integrate these recommendations into the overall patient care plan, and explain these recommendations to the rounding attending.

**Medical knowledge:** Fellows must demonstrate knowledge about established and evolving biomedical, clinical, and cognate (e.g. epidemiological and social-behavioral) sciences and the application of this knowledge to patient care.

1. *Demonstrate an investigatory and analytic thinking approach to clinical situations*
  - h. The PICU fellow will be able to identify the following clinical situations, their evaluation, and state the appropriate clinical management:
    - i. Respiratory distress and failure
    - ii. Upper versus lower airway respiratory failure
    - iii. Sepsis and septic shock
    - iv. Low cardiac output state
    - v. Pericardial effusion and tamponade
    - vi. Pulmonary hypertension
    - vii. Cyanosis
    - viii. Pulmonary edema
    - ix. Pneumothorax
    - x. Pericardial effusion/tamponade
    - xi. Myocardial ischemia
    - xii. Acute respiratory distress syndrome
    - xiii. Dysrhythmias
    - xiv. Anaphylactic shock and allergic reactions to medications
    - xv. Altered mental status, coma
    - xvi. Increased intracranial pressure
    - xvii. Intracerebral hemorrhage/stroke
    - xviii. Poisonings and overdoses
    - xix. Hyperthermia/hypothermia
    - xx. Seizures
    - xxi. Withdrawal from narcotics
    - xxii. ICU psychosis
    - xxiii. Metabolic encephalopathies
    - xxiv. Gastrointestinal hemorrhage
    - xxv. Hepatic failure
    - xxvi. Abdominal distension
    - xxvii. Coagulopathies
    - xxviii. Renal insufficiency/failure

## Program Goals and Objectives

- xxix. Pain and anxiety in the muscle relaxed patient
- xxx. Brain death

2. *Know and apply the basic and clinically supportive sciences which are appropriate to their discipline*
  - i. The PICU fellow will be able to state the anatomy, physiology, pathophysiology, pharmacology, and management for each of the following:
    - i. Asthma
    - ii. Bronchiolitis
    - iii. Pneumonia/pneumonitis
    - iv. Upper airway obstruction (croup, epiglottitis, subglottic stenosis, retropharyngeal abscess, etc)
    - v. Pulmonary contusion
    - vi. Necrotizing enterocolitis
    - vii. Peritonitis
    - viii. Meningitis/encephalitis
    - ix. Intracranial hemorrhage
    - x. Venocclusive disease
    - xi. Graft vs host disease
  - j. The PICU fellow will read and interpret radiographs performed in the PICU setting and recognize and discuss the appropriate management of the following common radiographic findings:
    - i. Pleural effusion
    - ii. Pericardial effusion
    - iii. Pneumothorax
    - iv. Hemothorax
    - v. Pneumomediastinum
    - vi. Subcutaneous emphysema
    - vii. Pneumonia/pneumonitis
    - viii. Atelectasis
    - ix. Hyperinflation
    - x. Paralyzed diaphragm

***Practice-based learning and improvement:*** Fellows must be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices.

1. *Analyze practice experience and perform practice-based improvement activities using a systematic methodology*
  - a. The PICU fellow will review 1 case per 6 month period as a chart review in the presence of a Division faculty member.
2. *Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems*

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- a. The PICU fellow will conduct 1 journal article review per 6 month period to be presented to and evaluated by the Division faculty
  - b. The PICU fellow will cite specific published literature to support their care plans.
3. *Obtain and use information about their own population of patients and the larger population from which their patients are drawn*
- a. The PICU fellow will discuss pertinent epidemiological studies by investigators in the Department of Pediatrics at the University of Tennessee Health Science Center. For example, discuss antibiotic resistance patterns in the city of Memphis.
4. *Apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness*
- a. The PICU fellow will conduct 1 journal article review per 6 month period to be presented to and evaluated by the Division faculty with particular focus in discussion on study design and statistical methods.
5. *Use information technology to manage information, access on-line medical information, and support their own education*
- a. The PICU fellow will demonstrate to faculty their ability to perform on-line literature searches to support their patient care decisions and they will present those searches to the rounding team.
6. *Facilitate the learning of students and other health care professionals*
- a. The PICU fellow will conduct 1 didactic presentation on a PICU topic of their choice to the PICU multidisciplinary health care team.

***Interpersonal and communication skills:*** Fellows must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their patients' families, and professional associates.

1. *Create and sustain a therapeutic and ethically sound relationship with patients*
  - g. The PICU fellow will explain the plan for the day with the family and discuss with them any significant changes in the condition of their child or the plan.
2. *Use effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills*
  - h. The PICU fellow will answer any questions and discuss any concerns the family raises in regards to their child.
3. *Work effectively with others as a member or leader of a health care team or other professional group*
  - i. The PICU fellow rotating in the TCU will participate in rounds and incorporate discussions from other members of the health care team (for example, nursing, respiratory therapy, pharmacy, nutrition service) into the daily care plan. He/she will call other physicians involved in the care of the patients in the TCU and

## Program Goals and Objectives

discuss the care plan with them. He/she will also call physicians from whom consultations are requested to discuss the issues to be addressed.

**Professionalism:** Fellows must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

1. *Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supercedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and ongoing professional development*
  - o. The PICU fellow will read the American College of Physicians Ethics Manual and discuss one section in a Division conference. The manual is available at: <http://www.acponline.org/ethics/ethicman.htm#alloc>. The fellow will also be observed for demonstration of respect, compassion, integrity; a responsiveness to the needs of patients and society that supercedes self-interest, accountability to patients, society, and the profession, and a commitment to excellence and ongoing professional development during daily contact with the faculty.
2. *Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices*
  - p. The PICU fellow will attend the University of Tennessee Health Science Center systems-based lecture series on confidentiality, informed consent, and business practices.
  - q. The PICU fellow will participate in the Bereavement conferences and discuss end of life issues with the health care team.
  - r. The PICU fellow will pass the University of Tennessee Health Science Center course on HIPPA.
  - s. The PICU fellow will read the American College of Physicians Ethics Manual and discuss one section in a Division conference. The manual is available at: <http://www.acponline.org/ethics/ethicman.htm#alloc>.
3. *Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities*
  - t. The PICU fellow will participate in the Bereavement conferences and discuss end of life issues with the health care team.
  - u. The PICU fellow will develop and carry out the patient management plans and state the results of those interventions to the multidisciplinary health care team during afternoon rounds, will explain the plan for the day with the multidisciplinary health care team and family and update them with any significant changes in the condition of their child or the plan. Observation by the faculty will focus in part on the ability of the PICU fellow to discuss these issues in a sensitive manner that is responsive to the patients' culture, age, gender, and disabilities.

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***Systems-based practice:*** Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.

1. *Understand how their patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice*
  - a. The PICU fellow will participate in the PediFlite Critical Care Transport team as the physician team member. He/she will travel to rural and small city community hospitals in order to stabilize and transport the child back to Le Bonheur Children's Medical Center. He/she will have a first hand opportunity to observe other health care organizations, interact directly with other physicians in the larger community, and become aware of the larger health care system in this part of the United States.
  - b. The PICU fellow will contact by phone referring physicians to provide follow-up and feedback regarding their patients.
  - c. The PICU fellow will attend the University of Tennessee Health Science Center systems-based lecture series on health care organizations.
2. *Know how types of medical practice and delivery systems differ from one another, including methods of controlling health care costs and allocating resources*
  - a. The PICU fellow will attend the University of Tennessee Health Science Center systems-based lecture series on types of medical practices, delivery systems, and health care organizations. The PICU fellow will have the opportunity to attend 1 national meeting per year where discussions with other trainees and pediatric critical care practitioners will allow the fellow to explore these various practice and delivery patterns.
3. *Practice cost-effective health care and resource allocation that does not compromise quality of care*
  - a. The PICU fellow as the leader of the multidisciplinary health care team will state a plan for diagnostic and therapeutic interventions for each patient using a cost-effective manner. He/she will compare the costs of specific diagnostic and therapeutic interventions, costs that can be obtained from various administrative offices of Le Bonheur Children's Medical Center. For example, the costs of specific laboratory tests can be obtained from the laboratory administration office.
  - b. The PICU fellow as the leader of the multidisciplinary health care team will state a plan for resource allocation at times when the number of patients exceeds the number of physical bed spaces in the PICU without compromising the quality of care for the most critically ill of the patients.
4. *Advocate for quality patient care and assist patients in dealing with system complexities*
  - a. The PICU fellow will develop and carry out the patient management plans and state the results of those interventions to the team during afternoon rounds.

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- He/she will be the leader of the multidisciplinary health care team and, as such, will advocate for the best care for their patient.
- b. The PICU fellow will explain the plan for the day with the family and discuss with them with any significant changes in the condition of their child or the plan. He/she will answer any questions, discuss any concerns the family raises in regards to their child, and discuss with members of the Department of Medical Social Work any issues in which system complexities are of a concern to the family.
5. *Know how to partner with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance*
- a. The PICU fellow will develop and carry out a discharge plan in coordination with the Discharge Planner and the Medical Social Worker in the Transitional Care Unit for the care of technology-dependent children. These plans will require coordination with health care managers and home health care providers for the care of these high-risk patients.
  - b. The PICU fellow will discuss and coordinate the transfer of children to other tertiary care centers that may be able to provide specialized care that the University of Tennessee Health Science Center does not or cannot provide.

### **Anesthesia Rotation**

#### ***Patient care:***

1. *Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families*
  - bb. The PICU fellow will explain the plan for the day with the family and discuss with them with any significant changes in the condition of their child or the plan.
2. *Gather essential and accurate information about their patients*
  - cc. The PICU fellow will obtain and record the necessary history, physical exam, and laboratory information in preparation for the anesthesia either on their own or with aid of other members of the multidisciplinary healthcare team.
3. *Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment.*
  - dd. The PICU fellow will state a plan for diagnostic and therapeutic interventions for each patient using clinical judgment and literature evidence.
4. *Develop and carry out patient management plans*
  - ee. The PICU fellow will develop and carry out the patient management plans with respect of choice of anesthetic and discuss those choices prior to the surgical case with the team.

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5. *Counsel and educate patients and their families*
  - ff. The PICU fellow will explain the plan for the day with the family and update them with any significant changes in the condition of their child or the plan. He/she will discuss risks of the selected anesthetic with the family at the discretion of the anesthesiologist.
6. *Use information technology to support patient care decisions and patient education*
  - gg. The PICU fellow will gather recent literature from internet sources supporting elements of the patient care plan and explain how the literature supports these elements to the rounding team.
7. *Perform competently all medical and invasive procedures considered essential for the area of practice*
  - hh. The PICU fellow will perform intubations, bag-mask ventilation, central venous and arterial access, conscience sedation, pericardiocentesis, thoracentesis, lumbar punctures, and chest tubes on patients at the discretion of the anesthesiologist.
8. *Provide health care services aimed at preventing health problems or maintaining health*
  - ii. Not applicable in this setting with this group of patients.
9. *Work with health care professionals, including those from other disciplines, to provide patient-focused care*
  - jj. The PICU fellow will seek out recommendations from consulting and co-managing services, integrate these recommendations into the overall patient care plan, and explain these recommendations to the anesthesiologist.

**Medical knowledge:** Fellows must demonstrate knowledge about established and evolving biomedical, clinical, and cognate (e.g. epidemiological and social-behavioral) sciences and the application of this knowledge to patient care.

1. *Demonstrate an investigatory and analytic thinking approach to clinical situations*
  - k. The PICU fellow will be able to identify the following clinical situations, their evaluation, and state the appropriate clinical management:
    - i. Low cardiac output state
    - ii. Cyanosis
    - iii. Pulmonary edema
    - iv. Pneumothorax
    - v. Dysrhythmias
    - vi. Increased intracranial pressure
    - vii. Malignant hyperthermia
    - viii. Hepatic failure
    - ix. Abdominal distension/“full stomach”
    - x. Coagulopathies
    - xi. Renal insufficiency/failure
    - xii. Pain and anxiety in the muscle relaxed patient

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2. *Know and apply the basic and clinically supportive sciences which are appropriate to their discipline*
  1. The PICU fellow will be able to state the pharmacology and pharmacokinetics for each of the following:
    - i. Sedative hypnotic drugs
    - ii. Neuromuscular blocking agents
    - iii. Opioids
    - iv. Inhalation anesthetic agents
    - v. Reversal agents
  - m. The PICU fellow will interpret invasive and noninvasive monitoring devices and recognize the following clinical conditions:
    - i. Hypoxia
    - ii. Hypotension/hypertension
    - iii. Hyperventilation/hypoventilation
    - iv. Hypercarbia/hypocarbia
    - v. Acidosis
    - vi. Pulsus paradoxus
    - vii. Hypovolemia
    - viii. Hyperthermia/hypothermia

***Practice-based learning and improvement:*** Fellows must be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices.

1. *Analyze practice experience and perform practice-based improvement activities using a systematic methodology*
  - a. The PICU fellow will review 1 case per 6 month period as a chart review in the presence of a Division faculty member.
2. *Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems*
  - a. The PICU fellow will conduct 1 journal article review per 6 month period to be presented to and evaluated by the Division faculty
  - b. The PICU fellow will cite specific published literature to support their care plans.
3. *Obtain and use information about their own population of patients and the larger population from which their patients are drawn*
  - a. The PICU fellow will discuss pertinent epidemiological studies by investigators in the Department of Pediatrics at the University of Tennessee Health Science Center. For example, discuss antibiotic resistance patterns in the city of Memphis.
4. *Apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness*

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- a. The PICU fellow will conduct 1 journal article review per 6 month period to be presented to and evaluated by the Division faculty with particular focus in discussion on study design and statistical methods.
5. *Use information technology to manage information, access on-line medical information, and support their own education*
  - a. The PICU fellow will show to the faculty their ability to perform on-line literature searches to support their patient care decisions and they will present those searches to the health care team.
6. *Facilitate the learning of students and other health care professionals*
  - a. The PICU fellow will conduct 1 didactic presentation on a PICU topic of their choice to the PICU multidisciplinary health care team.

***Interpersonal and communication skills:*** Fellows must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their patients families, and professional associates.

1. *Create and sustain a therapeutic and ethically sound relationship with patients*
  - j. The PICU fellow will explain the plan for the day with the family and discuss with them any significant changes in the condition of their child or the plan.
2. *Use effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills*
  - k. The PICU fellow will answer any questions and discuss any concerns the family raises in regards to their child.
3. *Work effectively with others as a member or leader of a health care team or other professional group*
  1. The PICU fellow rotating in the PICU will participate in morning rounds in preparation for surgery and incorporate discussions from other members of the health care team (for example, nursing, respiratory therapy, pharmacy, nutrition service) into the daily care plan. He/she will call other physicians involved in the care of the patients undergoing the procedure and discuss the care plan with them. He/she will also call physicians from whom consultations are requested to discuss the issues to be addressed.

***Professionalism:*** Fellows must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

1. *Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supercedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and ongoing professional development*

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- v. The PICU fellow will read the American College of Physicians Ethics Manual and discuss one section in a Division conference. The manual is available at: <http://www.acponline.org/ethics/ethicman.htm#alloc>. The fellow will also be observed for demonstration of respect, compassion, integrity; a responsiveness to the needs of patients and society that supercedes self-interest, accountability to patients, society, and the profession, and a commitment to excellence and ongoing professional development during daily contact with the faculty.
2. *Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices*
    - w. The PICU fellow will attend the University of Tennessee Health Science Center systems-based lecture series on confidentiality, informed consent, and business practices.
    - x. The PICU fellow will participate in the Bereavement conferences and discuss end of life issues with the health care team.
    - y. The PICU fellow will pass the University of Tennessee Health Science Center course on HIPPA.
    - z. The PICU fellow will read the American College of Physicians Ethics Manual and discuss one section in a Division conference. The manual is available at: <http://www.acponline.org/ethics/ethicman.htm#alloc>.
  3. *Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities*
    - aa. The PICU fellow will participate in the Bereavement conferences and discuss end of life issues with the health care team.
    - bb. The PICU fellow will develop and carry out the patient management plans and state the results of those interventions to the multidisciplinary health care team during rounds, will explain the plan for the day with the multidisciplinary health care team and family and update them with any significant changes in the condition of their child or the plan. Observation by the faculty will focus in part on the ability of the PICU fellow to discuss these issues in a sensitive manner that is responsive to the patients' culture, age, gender, and disabilities.

***Systems-based practice:*** Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.

1. *Understand how their patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice*
  - a. The PICU fellow will participate in the PediFlite Critical Care Transport team as the physician team member. He/she will travel to rural and small city community hospitals in order to stabilize and transport the child back to Le Bonheur Children's Medical Center. He/she will have a first hand opportunity to observe other health care organizations, interact directly with other

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- physicians in the larger community, and become aware of the larger health care system in this part of the United States.
- b. The PICU fellow will contact by phone referring physicians to provide follow-up and feedback regarding their patients.
  - c. The PICU fellow will attend the University of Tennessee Health Science Center systems-based lecture series on health care organizations.
2. *Know how types of medical practice and delivery systems differ from one another, including methods of controlling health care costs and allocating resources*
- a. The PICU fellow will attend the University of Tennessee Health Science Center systems-based lecture series on types of medical practices, delivery systems, and health care organizations. The PICU fellow will have the opportunity to attend 1 national meeting per year where discussions with other trainees and pediatric critical care practitioners will allow the fellow to explore these various practice and delivery patterns.
3. *Practice cost-effective health care and resource allocation that does not compromise quality of care*
- a. The PICU fellow as the leader of the multidisciplinary health care team will state a plan for diagnostic and therapeutic interventions for each patient using a cost-effective manner. He/she will compare the costs of specific diagnostic and therapeutic interventions, costs that can be obtained from various administrative offices of Le Bonheur Children's Medical Center. For example, the costs of specific laboratory tests can be obtained from the laboratory administration office.
  - b. The PICU fellow as the leader of the multidisciplinary health care team will state a plan for resource allocation at times when the number of patients exceeds the number of physical bed spaces in the PICU without compromising the quality of care for the most critically ill of the patients.
4. *Advocate for quality patient care and assist patients in dealing with system complexities*
- a. The PICU fellow will develop and carry out the patient management plans and state the results of those interventions to the team during rounds. He/she will be the leader of the multidisciplinary health care team and, as such, will advocate for the best care for their patient.
  - b. The PICU fellow will explain the plan for the day with the family and discuss with them any significant changes in the condition of their child or the plan. He/she will answer any questions, discuss any concerns the family raises in regards to their child, and discuss with members of the Department of Medical Social Work any issues in which system complexities are of a concern to the family.
5. *Know how to partner with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance*

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- a. The PICU fellow will develop and carry out a discharge plan in coordination with the Discharge Planner and the Medical Social Worker. These plans will require coordination with health care managers and home health care providers.
- b. The PICU fellow will discuss and coordinate the transfer of children to other tertiary care centers that may be able to provide specialized care that the University of Tennessee Health Science Center does not or cannot provide.