Introduction

In the past few years, the radiology department has become an increasing area of activity for pediatric anesthesiologists. Several factors have driven this growth in activity. First, pediatricians and surgeons began to order more imaging studies because advances in imaging technology improved the diagnosis and management of disease. Because young children will not remain motionless for these studies, the need for sedation and general anesthesia expanded. Second, the Joint Commission of Accreditation of Health Care Organizations emphasized safety as a consequence of increasing reports of adverse events. Many hospitals then reviewed their sedation practices and did not find standards of care. Because anesthesiology values safety and standards, hospitals asked anesthesiologists to provide this service. Finally, radiologists did not view sedation as a part of the practice of radiology. Consequently, they have requested anesthesiologists to assume this role. During the same time, critical care and emergency room pediatricians began to offer sedation and anesthesia services because of manpower shortages in pediatric anesthesiology and the fact that anesthesiology was not embracing this activity as part of its specialty. As a result, non anesthesiologists provide anesthesia

and sedation services for imaging in many institutions. In the future, we see the increased use of imaging technology in the operating room and other locations to aid surgery and other procedures as well as in research to investigate brain function. Non anesthesiologists will assume this activity unless pediatric anesthesiology takes leadership. Thus, for the future of our specialty, it is important for pediatric anesthesiology to embrace the growth in radiology and to provide anesthesia-sedation services wherever they may be **(Taghon TA. et al., 2006).**

As computed tomography (CT) and MRI continue to evolve, they will be increasingly used to guide diagnosis and treatment, especially in critically ill and medically complex children **(Taghon TA. et al., 2006).**

The number of diagnostic and therapeutic procedures done outside of the operating room has increased dramatically in the recent years. In children, most of these procedures require sedation, analgesia or both to achieve the degree of cooperation or immobilization necessary to complete these procedures successfully. While most of these procedures themselves pose little risk to the child, the administration of sedation or analgesia may add substantial risk (**Malviya S. et al., 2000).**

The demand of procedures performed on children outside the operating room setting often exceeds the capacity of anesthesia services. The number of children requiring sedation outside the traditional operating room is rapidly approaching the number of children requiring anesthesia in the operating room **(David Gozala and Yaacov Gozal. 2008).**

The growing number of diagnostic procedures, both invasive and noninvasive, has created a clinical challenge to provide sedation or anesthesia for a wide variety of patients in a safe and cost-effective manner. Although procedures may be scheduled on an outpatient basis, those who need anesthesia or sedation may disproportionately come from populations such as pediatric patients and patients with significant coexisting disease. The increasing number of diagnostic procedures and limited anesthesia provider resources have led to a variety of paradigms for providing sedation services, including the involvement of other specialists as well as nursing staff. In order to avoid adverse events, particularly in high-risk populations, attention needs to be paid both to pre-procedural assessment and to following guidelines regarding monitoring and drug dosages **(Lucinda L and Everett. 2001).**

The treatment pain and anxiety in children undergoing therapeutic and diagnostic procedures in the emergency

department has improved dramatically over the last few years. The availability of non invasive monitoring devices and the use of short acting sedative and analgesic medications enable physicians to conduct save and effective sedation and analgesia treatment **(Itai shavit et al., 2006).**

Infants and children, who undergo radiological imaging studies, whether diagnostic or interventional, may require sedation. Sedation may be indicated in order to minimize motion artifact, facilitate successful completion of the procedure, provide analgesia and, potentially, minimize risk to the patient **(Mason KP, 2008)**.

The anesthesiologist can play an important role in the care of patients during radiological diagnostic studies. The continued advancement in diagnostic technology such as MRI will require that anesthesiologists as well as other care providers meet the needs of patients safely and efficiently **(Mason KP, 2008)**.

ROLE OF THE ANESTHESIA DEPARTEMENT

A good relationship between the department of radiology and department of anesthesiology is critical to providing safe anesthetic coverage. Each department has its own need, goals, and guidelines. In order to achieve the common goal of being able to perform a successful exam under anesthesia while

minimizing the patient's exposure to risk, each department must be familiar with the other's needs. It is helpful to delegate a team of anesthesiologists that is committed to providing off-site anesthesia care. Each member of the anesthesia team should rotate regularly through the different radiology sites in order to maintain a familiarity not only with the procedures but also with the particular anesthesia demands unique to each site **(Mason KP, 2008)**.

It is critical to have skilled and flexible anesthesia technicians and biomedical engineers. These personnel should be familiar with all the off-site radiology suites as well as the individual needs associated with each site. The technicians are responsible for ensuring on a daily basis that each site is equipped with the necessary anesthesia machines, monitors, and equipment. Their maintenance of the machines and monitors is critical because often the equipment is different from that in the operating, rooms. Frequently, the equipment is handed down to the radiology department after the anesthesia machines and monitors are updated in the operating room. Some anesthesia equipment is actually retired from the operating rooms to find a permanent home in the radiology department. Some anesthesiologists may be unfamiliar with the older machinery, and may rely on the anesthesia and

bioengineering technicians for an in-service on the equipment, especially in locations with quick and multiple turnovers (the MRI) suite, which may schedule up to eight anesthetics per day), a conscientious technician is critical to ensuring that all used equipment is replaced and that supplies are restocked (laryngoscope handles and blades, laryngeal mask airways (LMAS), face masks, etc). A standard anesthesia cart should be at each anesthesia site, fully stocked with essential medications, necessary adjuvant equipment, spare ambu bag, end tracheal tubes, LMAs. Suction catheters, Intravenous supplies, laryngoscope handles and blades, and a variety of oral/nasopharyngeal airway. Jet ventilation equipment should be readily available. Especially in an off-site location, a team of good technicians and biomedical engineers is critical because it ensures that all necessary anesthesia equipment is available and properly functioning **(Taghon TA. et al., 2006).**