English Summary

Infants and children may require sedation when undergoing radiological imaging studies, whether diagnostic or interventional. The provision of safe anesthesia for the pediatric patients depends on a clear understanding of the physiologic and anatomic differences between children and adults. Differences in airway anatomy make the potential for technical airway difficulties greater in infants than in teenagers or adults.

MRI is the product of radio waves applied to an object in a strong permanent magnetic field through a coiled antenna around the body, and a one sort of radio-echo (Resonance) of the radio waves can be measured when the application of the radio waves is interrupted. A powerful computer calculates the results and transforms these data into an image.

Most pediatric sedation organizations follow the ASA pre-sedation evaluation guidelines which include three components **(1)** Child's medical history, **(2)** Focused physical examination and **(3)** Risk assessment. After triaging patients who are candidates for sedation, all the equipments should be checked before each sedation procedure.

Monitoring during MRI carries some difficulties due to the following causes: Magnetic interference, Radio magnetic interference, time varied magnetic field and wave guides. Sophisticated monitoring equipment has been developed and designed to be compatible with most MRI units, particularly the higher strength magnets.

Generally, there are four levels of sedation defined by the ASA: minimal sedation (anxiolysis), moderate sedation (conscious), deep sedation (unconscious) and general anesthesia. The personnel involved in monitoring and delivering pediatric sedation will influence the choice of sedation drug. Minimal and moderate sedation can be performed by qualified nurse while the last two levels must be performed by the anesthesiologist.

Sedation techniques aim for allay fear and anxiety, obtain the cooperation of the child, achieve immobilization to the degree needed for the procedure, reduce awareness and induce amnesia, reduce discomfort and pain, keep the child safe with minimal respiratory depression. Caution should be used when administering multiple sedation agents.

Infants are sedated well with low doses of chloral hydrate. However, rates of successful sedation with chloral hydrate in children range from 85–98 %.In infants and young children, orally or (less commonly) rectally administered drugs are adequate for sedation. In children with mental deficiency, parenteral sedation, usually intravenous, may be the preferred method. Intravenous sedation allows for rapid induction and recovery. However, intravenous sedation must be titrated for each patient, using the recommended dosage range.

Reasons for pre-selection of general anesthesia includes previously failed sedation, potential for failed sedation and perceived medical risk.

MRI and CT procedures themselves cause little risk to children, but sedation or general anesthesia when used to facilitate these procedures may add substantial risk, so the sedation of children requires a systematic approach including:

(1) No administration of sedating medication without the safety net of medical supervision; **(2)** Careful pre-sedation evaluation; **(3)** Appropriate fasting for elective procedures; **(4)** In urgent procedures, a balance between depth of sedation and risk; **(5)** A focused airway examination; **(6)** A clear

understanding of the pharmacokinetic and pharmacodynamic effects of medications; **(7)** Appropriate training and skills in airway management; **(8)** Appropriate equipment for airway management and venous access; **(9)** Appropriate medications and reversal agents; **(10)** Sufficient number of people to carry out the procedure and monitor the patient; **(11)** Appropriate physiological monitoring during and after the procedure; **(12)** A properly equipped and staffed recovery area; **(13)** Recovery to presedation level of consciousness before discharge; **(14)** Appropriate discharge instructions.

Vascular malformations are congenital and represent aberrant connections between blood vessels. Vascular malformations may be composed of lymphatic, arterial,; and venous connections. These lesions although present at birth, are often discrete and not clearly visible. As the child grows, the vascular malformation may expand rapidly. Embolization and sclerotherapy may decrease the size of the malformation, enable a more complete resection, as well as reduce blood flow to the lesion in order to reduce surgical risks

Adverse reactions to iodinated contrast agents occur at low rates but are encountered not infrequently given their widespread use. Older ionic agents, newer nonionic agents, and the newest nonionic isoosmolar agents are available with the oldest agents having the highest incidence of adverse reactions and the newest agents having a significantly lower incidence