# Introduction

Monitoring represents the process by which anesthesiologists recognize and evaluate potential physiologic problems in a timely manner. The term is derived from *monere*, which in Latin means to warn or remind. In perioperative care, monitoring implies the following four essential features: observation, instrumentation, interpretation of data, and initiation of corrective therapy when indicated.***(Barash PG et al,2007).***

What is monitoring? The verb monitor means to check systemically or to keep watch over.In the context of anesthesiology,monitoring means using both our senses and electronic devices to repeatedly or continuously measure important variables in an anesthestized patient.***(Miller RD,2005).***

Effective monitoring reduces the potential for poor outcomes that may follow anesthesia by identifying derangements before they result in serious or irreversible injury. Standards for basic anesthetic monitoring have been established by the American Society of Anesthesiologists (ASA). Today's standards (last amended on October 25, 1995) emphasize the importance of regular and frequent measurements, integration of clinical judgment and experience, and the potential for extenuating circumstances that can influence the applicability or accuracy of monitoring systems.***(Park R et al., 2003).***

Standard I requires qualified personnel to be present in the operating room, to monitor the patient continuously and modify

anesthesia care based on clinical observations and the responses of the patient to dynamic changes resulting from surgery or drug therapy. Standard II focuses attention on continually evaluating the patient's oxygenation, ventilation, circulation, and temperature and specifically mandates the following :

1- Using an oxygen analyzer with a low concentration limit alarm during general anesthesia.
2- Quantitative assessment of blood oxygenation during any anesthesia care
3- Quantitative monitoring of tidal volume and capnography are encouraged in patients undergoing general anesthesia.
4- Ensuring the adequacy of circulation by the continuous display of the electrocardiogram (ECG), and determining the arterial blood pressure at least at 5minute intervals. During general anesthesia, circulatory function is to be evaluated by assessing the quality of the pulse, either electronically or by palpation or auscultation.
5- Endotracheal intubation requires qualitative identification of carbon dioxide in the expired gas. During general anesthesia, capnography and end-tidal carbon dioxide analysis are encouraged.
6- During all anesthetics, the means for continuous measuring the patient's temperature must be available. When changes in body temperature are intended or anticipated, temperature should be continuously measured and recorded on the anesthesia record. ***(Park R et al., 2003).***

Electronic monitors improve a physician's ability to respond because they are able to make repetitive measurements at higher frequencies than humans and do not fatigue. Monitoring devices increase the specificity and precision of clinical judgments.***(Barash PG et al,2007).***

Electronic monitoring, no matter how sophisticated or comprehensive, does not necessarily reduce the need for clinical skills such as inspection, palpation, and auscultation. Although the authors believe that electronic monitors augment clinical judgments when properly used, there is little evidence that electronic monitors, by themselves, reduce mortality or morbidity. ***(Park R et al., 2003)***.

Moreover, there is considerable controversy regarding the need to apply specific monitors in unique clinical situations, particularly those that may add significant cost. Monitoring can be classified as invasive, minimally invasive, or noninvasive. Invasive monitors place patients at risk for complications related to their application and use. Anesthesiologists must balance the potential risk of instituting invasive monitoring with the presumed benefits derived from its application.***(Stoeling RK, 2004)***.

The variety of devices available for patient monitoring is expansive and changing as advances in biomedical engineering find their way into the marketplace. The Association for the Advancement of Medical Instrumentation has been effective in promoting design guidelines to ensure patient and operator safety and reduce stress and distractions often associated with medical monitoring. ***(Stoeling RK, 2004)***.