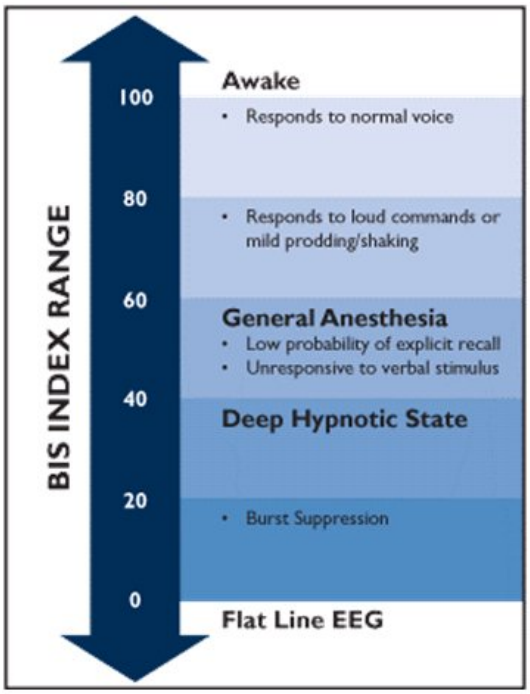
Intra-Operative Awareness

Anesthetic Pearls: Anesthetic Implications of Intra-Op Awareness

- Incidence of 0.2-0.4% in general surgical population (possible under-reporting of true incidence).
- Incidence is higher in surgery procedures for obstetric, cardiac, and major trauma.

Risk factors:

1. Gender (female)
2. Age < 60 years
3. Elective surgery
4. Low doses of volatile anesthetics
5. Muscle relaxants
6. Narcotic-based anesthetic technique



Monitoring for patient movement is recommended to assess potential for intra-op awareness in an unparalyzed patient. Patients who have experienced intra-op awareness commonly report auditory perceptions, a sensation of weakness or paralysis, pain, visual perceptions, or anxiety. Relatively high percentages of patients who suffer an episode of intra-op awareness later complain of sleep disturbances, flashbacks, and nightmares. However, relatively few individuals progress to develop actual post-traumatic stress disorder. One of the most recent monitoring systems developed is the BIS or PSA Array. The number projected on the screen is derived from bispectral analysis using an algorithm that computes the inter-frequency phase relationships and incorporates voltage, frequency, and coherence of the EEG. **No method is 100% effective in detecting the potential for intra-op awareness.**

Guidelines for Prevention of Intra-Op Awareness

1. Provide a pre-operative interview to decrease patient anxiety and fear.
2. Consider incorporating the possibility of intraoperative awareness as a part of the informed consent (especially for high-risk scenarios such as obstetric, cardiac, and major trauma anesthesia).
3. Maintain the highest degree of vigilance to avoid an anesthetic machine malfunction or the inadvertent administration of the wrong anesthetic (muscle relaxant in a syringe swap).
4. Unless there is a specific clinical contraindication, administer a volatile anesthetic at a dose > 0.6 MAC.
5. Monitor the end-tidal concentrations of volatile anesthetic agents.
6. Avoid techniques that rely mainly on anesthetics associated with preservation of the auditory evoked response, such as Opioids and Benzodiazapines, rather include volatile anesthetics that suppress the auditory evoked response.
7. Avoid muscle relaxants, especially doses which produce complete paralysis, unless required for the surgery.
8. If paralysis is necessary consider monitoring the bispectral index (**BIS** or **PSA**) or the auditory steady-state response. These monitors must be interpreted with the understanding that the positive and negative predictive values are not 100%.
9. If the induction is prolonged, consider supplemental doses of intravenous induction agents.
10. The administration of "top-up" doses should be considered before key noxious events that may exacerbate the potential for awareness (surgical incision and sternotomy).
11. Avoid light planes of anesthesia unless medically indicated (may improve "fast-tracking" of patients but increases the risk of awareness).
12. If a light plane of anesthesia is medically necessary (obstetric, cardiac, and major trauma) consider the use of anesthetic agents that preserve the hemodynamic state but have unique amnestic qualities such as Benzodiazepines, Ketamine, or Scopolamine.
13. Maintain an operating environment with minimal auditory stimuli (especially stimuli that are negatively oriented to the patient).