MONITORING ANESTHETIC DEPTH

Table 1: Table showing depths of Anaesthesia

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| Stages | Description | |
| 1 | Inducement, excitement, pupils constricted, voluntary struggling | |
| 2 | Obtunded reflexes, pupil diameters start to dilate, still excited, involuntary struggling | |
| 3 | Planes | There are three planes- light, medium, and deep |
| Light | More decreased reflexes, pupils constricted, brisk palpebral reflex, corneal reflex, absence of swallowing reflex, lacrimation still present, no involuntary muscle movement. | |
| Medium | Ideal plane for most invasive procedures, pupils dilated, loss of pain, loss of palpebral reflex, corneal reflexes present. | |
| Deep (early overdose) | Respiratory depression, severe muscle relaxation, bradycardia, no reflexes (palpebral, corneal), pupils dilated | |
| 4 | Very deep anesthesia. Respiration ceases, cardiovascular function depresses and death ensues immediately. | |

**Relating changes of reflexes to anesthetic depth**

• Palpebral reflex: varies between species. Dogs may have no reflex at adequate surgical depth although complete loss in horses indicates moderately deep anesthesia

• Corneal reflex: does not disappear until deep anesthesia. Should always be present

• Nystagmus: usually indication of excitement and light anesthesia. However, dissociative anesthetics (e.g., Ketamine) cause nystagmus at moderate anesthetic depth. In horses, central stimulation induced by severe hypoxia or hypercapnia also causes this phenomenon, and should not be confused with light plane of anesthesia as animals are perishing!

• Lacrimation: Parasympathetic stimulation, usually signs of light plane of anesthesia

• Medioventral eye ball position: the most desirable position in most species with the exception in horses (central)

• Jaw tone: moderate to loose, most desirable

**Most Reliable Signs of Anesthetic Depth**

• Gross purposeful movement

• Reflex movement in response to stimulation

• Immediate hemodynamic response to stimulation; sudden marked increase in heart rate or blood pressure.

• Immediate respiratory response to stimulation; sudden marked increase in respiratory rate or depth of breathing.

• Response to stimulation prior to actual incision (such as clipping, surgical preparation, drape, clamps).

**Reliable Signs of Anesthetic Depth**

• History of vaporizer setting

• Muscle tone (e.g. jaw tone)

• Pupillary light reflex

• Palpebral reflex

• Corneal reflex

• Moist cornea (lacrimination or tears)

• Position of the eyeball

**Less Reliable Signs of Anesthetic Depth**

• Heart Rate: may increase or decrease with increased depth of anesthetic plane. At deep plane it may accompany bradycardia, but also severe cardiovascular depression may increase heart rate to compensate for fall in stroke volume. (differentiate from noxious stimulation induced increase; less marked in changes).

• Respiration rate: may increase or decrease with deepening anesthesia. At deep plane, it may accompany apnea, but also may initiate a rapid shallow breath following a period of apnea as a compensation. (similar to hemodynamics, fall in tidal volume tends to increase respiration rate.)

• Blood pressure is similar to heart rate, but probably more reliable. In general, the volatile anesthetics; halothane, isoflurane, sevoflurane, and desflurane produce a dose-dependent decrease in arterial blood pressure and many anesthetists use this depression to assess the depth of anesthesia.

Taken from= https://instruction.cvhs.okstate.edu/vmed5412/pdf/15AnestheticMonitoring2006.pdf