

To assess the depth of anaesthesia look at the:

Dorsal palpebral reflex, gag reflex, pedal reflex, position of eyes in orbit, jaw tone, response to noxious stimuli, cardiovascular and respiratory parameters.

## THE SIGNS AND STAGES OF ANAESTHESIA

- The transition from consciousness has been traditionally divided into various stages and planes.
  - Each stage or plane is defined by specific signs of anaesthesia.
  - The classical signs of anaesthesia are mostly provided by the presence or absence of reflex stimuli.
  - The most commonly evaluated sign in veterinary medicine is the **palpebral reflex**.
  - Also important, because of the use of endotracheal tubes, is the **gag (pharyngeal) reflex**.
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- In the discussion of the stages of anaesthesia we shall use the ether anaesthesia model.
  - The stages of anaesthesia are:
    - STAGE I
    - STAGE II
    - STAGE III -: Planes I, II, & III
    - STAGE IV

### STAGE I

- **STAGE OF VOLUNTARY EXCITEMENT**
- The animal is conscious and may make forcible attempts to avoid being anaesthetised.
- Reflexes are normal, possibly even hyperreflexic.
- Breathing is entirely volitional.
- There is fear and apprehension → epinephrine release → increased heart and respiratory rates.
- Excessive salivation may occur.
- Urine and faeces may be voided.

## STAGE II

### • STAGE OF INVOLUNTARY EXCITEMENT

- There is abrupt loss of consciousness on entering this stage.
- Voluntary centres in the brain are depressed and abolished.
- Reflex response to external stimuli is exaggerated and limb movements may become violent, necessitating restraint.
- Vocalisation may occur.
- There is increased sympathetic tone.
- The eyelids are wide open and the pupils are dilated.
- Respiration is irregular and breath-holding occurs, usually accompanying struggling.

## STAGE II

- The pharyngeal reflexes of swallowing and vomiting are present (but become progressively depressed and disappear upon entering stage III). Thus reflex vomiting is common unless food has been withheld for at least 6 hours before anaesthesia.
- The cough reflex is also present.
- Urination and defecation may occur.
- Stages I & II are associated with difficulties for the anaesthetist and thus the goal is to minimise the length of time the subject remains in these stages and to enter stage III as quickly and smoothly as possible.

## STAGE III

### • STAGE OF SURGICAL ANAESTHESIA

#### • PLANE I: light anaesthesia

- There is onset of regular autonomic breathing and cessation of all limb movements.
- Palpebral, conjunctival, and corneal reflexes all disappear.
- The gag reflex is still present.
- The response to nociception (sensing noxious stimuli) is still present; the pedal reflex in dogs and cats is strong.
- Cardiovascular function is minimally affected.
- The eyeballs move from side to side. This becomes sluggish as anaesthesia deepens until the eyes become fixed, signifying entry into the second plane.

## STAGE III

- **Plane II: medium anaesthesia**
- The respiration is similar to the first plane with the respiratory rate increasing and depth decreasing only when approaching the third plane.
- Gag reflex is lost.
- Eyeballs are fixed.
- Muscle relaxation is progressively more pronounced.
- The pedal reflex becomes sluggish.
- Cardiovascular function is mildly depressed.
- **This plane is adequate for minor surgeries.**

## STAGE III

- **Plane III: deep anaesthesia**
- Autonomic breathing is still present, but respiratory rate increases while depth decreases. There is a noticeable pause between inspiration and expiration.
- Pedal reflex disappears.
- Cardiovascular function is moderately depressed.
- **This stage and plane is suitable for all types of surgery.**

## STAGE IV

- **OVERDOSAGE**
- There is complete paralysis of the intercostal muscles. The breathing involves only diaphragmatic activity, and thus the respiration appears jerky and gasping in nature.
- The pupils are central and dilated; fish-eye appearance.
- Cardiovascular function is generally impaired. There is hypotension and decreased cardiac contractility. Pulse rate is initially increased.
- Respiratory arrest occurs. The gasping becomes progressively less in amplitude and finally ceases. Cyanosis appears.
- Circulatory collapse & heart failure occurs. The cyanosis is replaced by an ashen grey colour.
- Death follows.