General recommendations for the induction period:

- Adequate pre-medication including adequate analgesia is highly beneficial in most cases as it will reduce the dose of induction agent required and facilitate induction. Appropriate calm restraint and an unstimulating environment will also facilitate induction.
- The timing of induction relative to premedication is important and should coincide with the peak effect of the premedication agents, i.e. >30 minutes after IM acepromazine, 10 minutes after IM medetomidine.
- Premedication will reduce the dose of induction agent needed.
- Alpha-2 agonists will often dramatically reduce the dose of induction agent needed and delay onset of induction – beware of overdose.
- Secure IV access and effective premedication are prerequisites for the safe induction of anaesthesia.
- Oxygen (and a means of delivery) should always be available.
- IV induction agents (propofol, alfaxan) should be administered slowly to effect – the correct dose is enough!
- The use of appropriate drugs by the IM route is acceptable in patients whose temperament precludes safe handling and/or IV access.

It may on occasion be appropriate to consider induction with a volatile agent; however the relative merits of each technique need to be considered.

IV induction:

- little equipment needed
- usually easy to administer
- induction can be rapid and smooth
- relatively cheap
- no environmental pollution
- once given, retrieval is impossible; so beware dose calculations
- must weigh patient accurately
- most have profound cardiorespiratory side effects and are poorly tolerated by debilitated, hypotensive patients, and those with renal or hepatic impairment
- abuse potential
Injectable induction agents

Propofol

- emulsion in lipid
- No preservative: emulsion supports rapid bacterial growth (28-day preparation available)
- Not irritant extravascularly
- Respiratory depression (especially when given rapidly)
- Cardiovascular depression (bradycardia with opioids)
- No analgesia
- Smooth induction: pain on injection occasionally reported
- Occasional hyperextension/tremors
- Rapid hepatic metabolism (± extra-hepatic metabolism) – less so in cats
- Rapid recovery, no hangover

Alfaxalone

- Launched in UK in new formulation (cyclodextrin)
- No preservative but does not support bacterial growth as well as propofol
- Not irritant extravascularly; can be used IM
- Respiratory depression (not as pronounced as propofol)
- Cardiovascular depression (less than propofol)
- No analgesia
- Smooth rapid induction
- Very rapid hepatic metabolism & rapid recovery
- Excitable recoveries may occur in inadequately pre-medicated patients

Ketamine

- Onset of action relatively slow
- Dissociative anaesthetic agent
- Poor muscle relaxation – must be given with benzodiazepine or alpha-2 agonist
- Minimal respiratory depression
- Cardiovascular effect is minimal in healthy animals, care in hypotensive animals
- Analgesic and anti-hyperalgesic
- Has been associated with excitable recoveries

Etomidate

- Not licensed for animal use in the UK
- Hyperosmolar; pain on injection (emulsion form available)
- Myoclonic movements after induction
- Minimal cardiovascular or respiratory depression
- Rapid recovery
- Used in high-risk patients in Europe & the USA
- Potent inhibitor of adrenocortical function
Volatile agent induction

Inhalational techniques for inducing anaesthesia are useful in many cases. The technique benefits greatly from sedative pre-medication. Attention to scavenging and the reduction of contamination is required. Excessive dead space in chambers will slow the rate of induction.

Advantages

- permits provision of a high FiO2
- obviates the need for the use of intravenous agents and their associated unwanted effects
- useful where protein binding or total protein is reduced, making the estimation of the dose of usually heavily protein bound intravenous agents difficult

Disadvantages

- Often stressful to the patient
- Does not allow rapid control of the patient’s airway
- Nitrous oxide may be a useful adjunct to mask induction, the second gas effect reducing induction time by hastening uptake of the volatile agent. Use of nitrous oxide will reduce the FiO2
- Mask induction should be avoided in
  - Patients with upper airway obstruction
  - Patients at risk of regurgitation/ reflux
  - Patients with severe dyspnoea and/or intrinsic pulmonary disease
  - Patients with reduced pulmonary blood flow

Sevoflurane is generally preferable to isoflurane for volatile inductions due to its less pungent vapour and lower blood solubility (the latter leading to more rapid uptake).

Intramuscular induction

These techniques are most commonly used where IV access is not readily available, and usually are based on the use of ketamine co-administered with either an alpha-2 agonist or a benzodiazepine. Animals anaesthetised with IM agents should be regarded as such, and not just heavily sedated. These patients require the same standards of care and monitoring as those receiving more complex techniques. Difficulty in recognizing the transition phase from sedation to anaesthesia complicates (and may compromise) airway control. The use of IM anaesthetic techniques is not without risk and oxygen supplementation is always recommended.