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BAN THE BOX

We call it practicing veterinary medicine because we are always improving! Inhalant chambers have been around for a long time and some believe that this technique is safer for the staff and the animal. However, we now know so much more about the physiological and psychological risks this technique poses to both animals and humans, along with better alternatives.

MASK INDUCTION OR BOX INDUCTION

Induction of general anesthesia with inhalant anesthetic drugs alone ('masking' or 'boxing')

Masking down a patient is the act of restraining them and holding a gas mask over their face until they are anesthetized.

Box induction is the act of putting a cat into a non-porous plexiglass tank and running anesthetic gas into the tank to render them unconscious.

INHALANT INDUCTION IS DANGEROUS TO ANIMALS

- Patients cannot be accurately monitored.
- Post-operative analgesia is not provided by inhalants alone.
- There is a lack of protected airway with this method.
- Inhalant anesthetic drugs can cause dose-dependent depression of the CNS and cardiovascular and respiratory systems. Thus, a LOW dose of inhalant gas is safe, but the HIGH dose required to induce a patient to anesthesia when no concurrent drugs are administered is technically an overdose and is NOT safe.
- "Post-operative (long-term) cognitive impairment and muscle dysfunction are two common side effects described in the literature for both humans and animals. This is a disorder that is temporary but can last hours to weeks depending on the health status of the patient, including age and the duration of use. It is characterized in animals as a general depression or blunted natural behaviors. In studies evaluating post-isoflurane exposure, animal models have failed previously taught behaviors, had significantly slower responses, or poorer scores. General weakness is described in humans with post-operative muscle dysfunction and is suspected to be the same in animals." (8)

INHALANT INDUCTION IS DANGEROUS TO PEOPLE

- Staff members are exposed to high levels of waste anesthetic gases.
- No matter how tightly the mask fits or how careful you are with the induction chamber, anesthetic gas will contaminate the environment and the staff will be exposed to inhalant gas. Although anesthetic gases are very safe, chronic exposure has been shown to cause headaches and irritability and may lead to more serious health issues.
- "Exposure to waste anesthetic gases can cause serious injury and permanent damage." (6)
- Some potential effects of exposure to waste anesthetic gases are nausea, dizziness, headaches, fatigue, irritability, sterility, miscarriages, birth defects, cancer, liver disease, and kidney disease. (6)



INHALANT CHAMBERS INCREASE STRESS AND PERPETUATE FEAR

- Excessive stress can be induced by pungent odors and a prolonged induction period. Behaviors such as circling, pacing, digging, and jumping have also been described with inhalant anesthesia induction. This is likely due to the strong odor of isoflurane and its irritating effect on the airway and eyes. These behaviors indicate a state of distress in the animal.

- “Chamber induction in unmedicated, agitated cats is the least desirable technique described in these Guidelines, since an agitated cat will require more inhalant anesthetic to achieve the desired endpoint. This increased inhalant anesthetic requirement results in severe depression of the cardiovascular system. Additionally, an increased release of catecholamines predisposes the cat to development of cardiac arrhythmias.” (1)
- Inhalant chambers cause increased struggling, breath-holding, and excitement because induction times with inhalant anesthetics are generally slower than intravenous agents such as propofol. (9)
- Studies show that a single exposure to a stressful event can increase future fear, anxiety, and stress (FAS). Most of the studies were conducted where cats were simply examined, so we can certainly conclude that the use of inhalant chambers will likely cause significant stress at that time and in the future as well. Increased FAS will complicate future veterinary visits and can lead to the development of behavioral disorders which can damage the human animal bond or result in relinquishment or euthanasia.

STRESS INCREASES MORBIDITY AND MORTALITY

- Stress-induced cardiac arrhythmias can be severe, causing an increase in the likelihood of morbidity and mortality.
- The maintenance period of anesthesia is also more dangerous if inhalant anesthetic agents are the only drugs utilized. The patient has no basal level of analgesia and / or sedation to help blunt responses to surgical stimulus and high concentrations of inhalant drugs are required to keep the patient asleep. Inducing and maintaining patients with inhalants alone adds to the risk of anesthetic fatalities (10).

INCREASED FEAR, ANXIETY, AND STRESS COMPROMISE PATIENT CARE AND VETERINARY STAFF SAFETY

- Patients subjected to an inhalant chamber may display more fear and aggression. This can make administration of treatments and medications in hospital or at home following the procedure more difficult or unsafe for veterinary staff or clients.
- Dog and cat bites as well as cat scratches are the most common cause of injury to veterinary hospital staff (11), so increased pet fear and anxiety compromise the safety of staff.
- Overall, the implications of using an inhalant chamber are far-reaching. For all of the above reasons, taking steps to decrease physiological and emotional stress is an essential medical goal, one that is significantly undermined by use of an inhalant chamber or mask.

WHAT TO DO INSTEAD

MINIMIZING STRESS: TRANSPORTATION AND HANDLING ON ARRIVAL

Determine a plan with the caregiver prior to the visit when possible. This can include carrier training, low stress travel tips, scheduling at a particular time when the hospital is less hectic and providing pre-visit pharmaceuticals to help reduce fear and anxiety. Be prepared by having all equipment and supplies available prior to examining and sedating the animal.

Request that the pet caregiver transport the patient in a soft, squeezable carrier or a carrier with a top that can be easily removed to facilitate low-stress handling. When the pet arrives at the hospital, immediately place the pet, still in the carrier, in a quiet room on an elevated surface. Cover cat carriers with towels sprayed with Feliway.

Proper patient handling skills are paramount to minimizing stress and increasing safety during sedation or anesthesia (2, 3). Low-stress handling techniques are intended to minimize fear and pain experienced by pets during the veterinary examination and increase the safety of the veterinary team (2, 3). When handled appropriately with gentle restraint and Fear Free techniques, full anesthesia may not be necessary.

All staff that handle animals should be trained in feline friendly/Fear Free/low stress handling techniques and have an established SOP from the time the cat arrives until they leave. (1)

All animals are individuals, and we need to assess our own and the animal's body language. Be mindful of painful joints, patient's stress level, medical conditions, the nature of the procedure/exam, and temperature changes (i.e. cold stainless-steel tables), and adjust your handling based on each cat and their individual response to restraint. Make a handling plan which addresses who will be doing what, the order of procedures, what happens where and when, decisions regarding following the same plan as last time or needing to alter/update it, where will any injections be given, etc .

Gentle control should be used when removing the pet from the carrier, performing a physical exam, and administering intramuscular injections. Avoid pulling or shaking the cat out of the carrier. Instead, assess body language and take the carrier apart and/or use treat or toy to lure out of carrier. If the cat won't leave the carrier, take the top half of the carrier off, if possible, so that the cat can remain in the bottom half for as much of the exam as possible. If the cat is exhibiting stressed, fearful, or fear/pain related aggressive behaviors, with another staff member, remove the top half of the carrier while the other staff member places a towel between the two halves of the carrier. This provides a safe hiding place for the cat and allows you to wrap the towel around (ie, 'burrito wrap') the cat if needed. Towering over a cat from above or grabbing at it in a carrier or cage can be frightening and should be avoided. When doing this, you should be communicating with each other and have everything needed prior to. (ie locate where the cats front end is, one staff member removes top slowly as the other staff member uses one to two towels to place over the cat, sedation is drawn up ahead of time, and then sedation can be administered, lid replaced and the cat is monitored and remains in the safety of their carrier until sedated.)

For fearful cats who arrive in a soft carrier, you can sedate the cat while still in the comfort of the carrier. You can gently squeeze the sides of the carrier, collapsing the carrier onto the cat, and use a towel to secure them. An intramuscular injection can then be administered through the carrier. You can also use this same technique but instead of giving the injection through the carrier, you can unzip the door where the cats rear end is located of the carrier and administer injection.

Another option is to administer medications by attaching a catheter to the end of a syringe and squirting the drugs into the cat's mouth as they are hissing. There are many drugs that are well absorbed transmucosally. This can be an option to help reduce fear and stress so that the proper doses of drugs can be administered intravenously or intramuscular.

Other considerations include getting assistance from a more experienced handler, reassess and modifying approach/restraint, and if the procedure is not emergent (ie a wellness exam), rescheduling the procedure with a plan in the place that includes carrier training, PVP's, etc

- If the procedure is elective and the cat has become distressed, a viable option is to reschedule with a plan to address fear before the cat returns to the hospital. Without a complete physical examination, the potential for missing or misdiagnosing comorbidities is significantly increased, thereby increasing anesthetic risk. (1)

PATIENT CONSIDERATIONS, PREOPERATIVE ASSESSMENT, AND CONSIDERATIONS

"An individualized anesthetic plan with specific and sequential steps ensures the continuum of care throughout the entire anesthetic process. A complete anesthetic plan must address all phases of anesthesia, with inclusion of perioperative analgesia throughout each phase. Although each patient should be treated as an individual, having a set of anesthesia plans that are used repeatedly is appropriate. This allows the anesthesia team a level of comfort with their anesthesia protocols while adjusting plans based on individual patient needs." (12)

Goals of the pre-anesthetic period are to minimize patient stress, prepare an individualized anesthesia and analgesia plan, anticipate potential complications, and assemble monitoring and support equipment. (1)

Severity of pre-existing health problems guides the anesthetist in the choice of premedications, crystalloid fluid type and rate, induction agents, inhalant, and analgesic.

BETTER LIVING THROUGH CHEMICAL RESTRAINT

Chemical restraint is often necessary for animals displaying fear and aggression and should not be considered a last resort. (4, 5)

According to the American Association of Feline Practitioners/International Society of Feline Medicine Guidelines on Feline Friendly Handling, indications for chemical restraint include the following:

- when an animal shows fear, anxiety, stress, or aggression;
- situations in which pain, discomfort, or surgery is anticipated and where analgesia alone will be insufficient; or
- when gentle restraint does not provide sufficient safety for the team.

Fortunately, there are many chemical restraint alternatives to inhalant induction, starting with premedication at home.

Overall, the use of inhalant chambers and masks is dangerous and stressful for both pets and veterinary staff. Staff members are exposed to high levels of waste anesthetic gases. Patients cannot be accurately monitored, inhalant chambers and masking increases stress and perpetuates fear, increases the risk of morbidity and mortality, and compromises patient care and veterinary staff safety. "Given the many alternatives that exist, use of an induction chamber or mask is a poor choice for sedation or induction and should be avoided for all patients. We as a veterinary community must prioritize practices that are both safe and stress-reducing for our patients and colleagues." (7)

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ABOUT ME



Tabitha Kucera is an elite Fear Free and Low Stress Handling certified RVT, CCBC, and KPA-CTP. She is the owner of Chirrup and Chatter cat and dog behavior consulting and training. She loves educating through writing, behavior consulting, and lecturing on all things cats including Fear Free, kitten socialization, feline friendly handling, working with fearful animals, and more. She enjoys the opportunity to help people better understand and relate to cats.



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