**MODULE 4: DENTISTRY, RADIOLOGY, AND SURGERY**

**Lesson 1: Spay and Neuter Surgery Protocols**

[Note to Trainer: Information on current pain management recommendations is available from the International Veterinary Association for Pain Management’s website.]

1) What vaccines are required before booking a spay or neuter surgery?

**Answer:**

2) How old must a pet be before she or he can be spayed or neutered?

**Answer:**

3) Why does our practice recommend this age for spaying or neutering?

**Answer:**

4) Why is pain medication needed for surgery? How do you explain our practice’s pain medication protocol to a client?

*Sample Response: Pain medication not only decreases pain but also the* **incidence** *of licking and chewing at incisions, and reduces the risk of complications such as swelling, infection, and fever.*

5) What pain medication is used for cat neuters?

**Answer:**

6) What pain medication is used for dog neuters?

**Answer:**

7) What pain medication is used for cat spays?

**Answer:**

8) What pain medication is used for dog spays?

**Answer:**

9) What else is required before a pet is admitted to our hospital for a spay/neuter?

[Note to Trainer: Does your practice require deworming, preanesthetic blood testing, or a presurgical examination by a veterinarian?]

**Answer:**

10) How long does a pet remain in the hospital following a neuter surgery?

**Answer:**

11) How long does a pet remain in the hospital following a spay?

**Answer:**

12) When is a dog considered too old to spay or neuter?

**Answer:**

13) How should team members respond to clients who ask, “Will my dog/cat get fat after spaying/neutering?”

*Sample Response: Studies have shown that neutering and spaying can cause changes in metabolism and appetite. Cats may begin to eat more food within three days of castration. In a separate study cats were consuming 50% more food than cats that were not neutered seven weeks after neutering. In dogs, neutering triples the rate of obesity and spaying doubles the rate of obesity. Nonetheless, spaying and neutering do not have to lead to obesity. The pet’s activity level and the amount the owner feeds are important factors. Owners should be encouraged to carefully monitor their pet’s food intake to avoid obesity postsurgically (Edney and Smith 1986; Chastain and Panciera 2003; Nguyen et al. 2004; McGreevy et al. 2005).*

14) How do we respond to clients who ask, “Will spaying/neutering change my pet’s personality?”

*Sample Response: Intact male dogs represent 80% of dogs presented to veterinary behaviorists for dominance aggression (i.e., the most commonly diagnosed form of aggression). Intact males are also involved in 70-76% of reported dog bite incidents (Wise and Yang 1994; Beaver 1999).*

15) On average, will a spayed or neutered pet live longer than an unspayed or neutered pet?

**Answer: Yes, for the many reasons listed below**

16) What diseases occur in intact female pets?

**Answer: The major diseases that occur primarily in unspayed pets include pyometra and mammary tumors. Spaying an animal before the first heat cycle nearly eliminates the risk for mammary cancer. Spaying at any age removes the risk for a pyometra. Ovarian or uterine tumors, Brucellosis, and transmissible venereal warts are other health issues diagnosed in intact females, though these are less common (Chastain, Panciera, and Waters 1999; Kitchell 2007).**

17) What diseases occur in intact male pets?

**Answer: Benign prostatic hypertrophy and perianal tumors occur commonly in older intact males. Prostate cancer can occur in neutered or intact males. In male cats, roaming, fighting, and becoming infected with contagious diseases such as feline leukemia (FeLV) and feline immunodeficiency virus (FIV) are common. Nineteen percent of cats with abscesses or bite wounds have FeLV or FIV according to the FeLV/FIV guidelines at www.aafponline.org. In both dogs and cats, behaviors such as territorial marking/spraying, aggression, and roaming are frequent problems. Intact male dogs are a minority of the total dog population but account for the majority of animals that are hit by cars.**

18) What is pet overpopulation?

**Answer: There are too many pets. Eight to ten million lost and unwanted dogs and cats enter animal shelters every year in the United States. Four to six million of them are subsequently euthanized. Since 25% of dogs in shelters are purebreds, pet overpopulation is not simply a problem associated with mixed breeds.**

19) When does a female dog go into heat?

**Answer: At six to ten months of age, depending on the size of the dog**

20) When does a female cat go into heat?

**Answer:****At five to eight months of age, depending on the season**

21) How long does a heat last in a dog?

**Answer: The entire process lasts about three weeks but the bitch is only fertile for approximately seven days or less.**

22) How long does a heat last in a cat?

**Answer: Cats go in and out of heat continuously during the spring and summer. It can be difficult to tell when one heat cycle stops and another begins.**

23) Does our practice spay female dogs that are in heat? Why or why not?

**Answer:**

24) Does our practice spay female cats in heat?

**Answer:**

25) Does our practice spay pregnant dogs?

**Answer:**

26) Does our practice spay pregnant cats?

**Answer:**

27) Do stitches need to be removed after spaying/neutering?

**Answer:**

28) Even if stitches do not need to be removed, are all cases rechecked following surgery?

**Answer:**

29) What is a *Staph* infection?

**Answer: It is a bacterial skin infection (pyoderma) caused by bacteria in the family *Staphylococcus*. It is common to find *Staph* infections when preparing the patient for surgery, especially for spays and neuters in adolescent dogs.**

**MODULE 4: DENTISTRY, RADIOLOGY, AND SURGERY**

**Lesson 2: Elective Surgery**

[Note to Trainer: AAHA's position statement with regard to declawing is as follows: Declawing of domestic cats should be considered only after attempts have been made to prevent the cat from using its claws destructively or when clawing presents a significant health risk for people within the household. AAHA's position statement with regard to ear cropping and tail docking is as follows: Ear cropping and/or tail docking in pets for cosmetic reasons are not medically indicated nor of benefit to the patient. These procedures cause pain and distress, and, as with all surgical procedures, are accompanied by inherent risks of anesthetic complications, hemorrhage, and infection. Therefore, the American Animal Hospital Association opposes both the cropping of ears and the docking of tails when done solely for cosmetic reasons. See https://secure.aahanet.org/eweb/dynamicpage.aspx?site=resources&webcode=referencegroup for the full position statement.]

1) Does our practice perform declaws in cats? Why or why not?

**Answer:**

2) If our practice offers this surgery, how is it performed?

**Answer:**

3) What are some reasons that a cat should not be declawed?

**Answer:**

4) Does our practice recommend two (front) or four (front and hind) paw declawing? Why?

**Answer:**

5) Would the declaw procedure be approached differently for a three-year-old versus a 12-year-old cat?

**Answer:**

6) What is a tendonectomy?

**Answer:**

7) Does our practice offer tendonectomies?

**Answer:**

8) What is the minimum age/size for a kitten to be scheduled for declaw/tendonectomy?

**Answer:**

9) What pain medications are administered to declaw/tendonectomy patients?

[Note to Trainer: What pain score does a declawing fall into? What are pre- and postoperative pain management strategies?]

**Answer:**

10) How long is a cat hospitalized following declawing?

**Answer:**

11) What are the postoperative instructions following declaw or tendonectomy?

**Answer:**

12) What kind of cat litter is recommended following declaw surgery?

**Answer:**

13) What are Soft Paws™?

**Answer:**

14) Does our practice sell or recommend Soft PawsTM?

**Answer:**

15) When are dewclaws removed and why?

**Answer:**

16) Does our practice perform ear cropping?

**Answer:**

17) Does our practice offer laser surgery?

**Answer:**

18) What are the advantages of using a surgical laser?

**Answer: The laser seals and cauterizes blood vessels and nerve endings, which decreases bleeding, swelling, and immediate postoperative pain.**

19) What are the disadvantages of using a surgical laser?

**Answer: Stitches cannot be removed as soon postoperatively and laser surgery is more expensive.**

20) Does our practice offer **electrosurgery**? How does electrosurgery compare to laser surgery?

**Answer:**

21) Does our hospital offer **endoscopy**?

**Answer:**

22) Does our hospital offer **arthroscopy or laparoscopy**?

[Note to Trainer: If you do not offer these services, who are patients referred to?]

**Answer:**

23) Does our hospital have any other specialized surgical equipment?

**Answer:**

**MODULE 4: DENTISTRY, RADIOLOGY, AND SURGERY**

**Lesson 3: Hospital Policies and Procedures**

1) Which team member admits surgery patients? When are these patients admitted?

**Answer:**

2) How should team members respond when a client asks, “Why can’t I drop my pet off later if the surgery won’t be performed until after 11 a.m.?”

*Sample Response: All surgical patients are admitted first thing in the morning so the presurgical examinations, ECGs, and blood work can be performed before surgery is begun.*

3) Are all surgery patients weighed on admission?

**Answer:**

4) Who is responsible for weighing pets admitted for a dental procedure?

**Answer:**

5) What preanesthetic testing does our hospital require or recommend?

**Answer:**

6) How is preanesthetic blood testing explained to the client? What is it and why is it important?

**Answer:**

7) Does our practice recommend or require a preanesthetic ECG?

**Answer:**

8) When are clients provided an estimate for elective surgeries?

[Note to Trainer: Is every client given an estimate for any elective procedure? Is the estimate prepared during the last puppy or kitten vaccination visit, during a presurgical examination, or when the patient is being admitted for surgery? Which team member reviews the presurgical estimate?]

**Answer:**

9) When are intravenous (IV) fluids recommended during surgery?

[Note to Trainer: Are IV fluids mandatory or optional? Or does this depend on the patient and the procedure?]

**Answer:**

10) When does our practice recommend microchipping?

**Answer:**

11) What consent forms do clients sign for surgery, day procedures, microchipping, etc?

**Answer:**

12) Why and how are each pet’s belongings labeled? Where are they kept?

**Answer:**

13) Which team member is responsible for the pet’s belongings?

**Answer:**

14) Where are the files for hospitalized pets kept?

**Answer:**

15) What is a surgery white board? Does our practice use one?

**Answer:**

16) How are surgery packs sterilized?

**Answer:**

17) Are clients encouraged to phone to see how their pet did during surgery or will a team member phone the client after the animal has recovered from anesthesia?

**Answer:**

18) Are clients permitted to visit their pet postsurgically?

[Note to Trainer: The AAHA standards recommend that you have a written protocol on visitation.]

**Answer:**

19) What is the earliest that an owner can schedule a pick-up time for a pet that has been hospitalized overnight?

**Answer:**

20) What vaccines, if any, can be administered at the time of a routine surgery or dental cleaning?

**Answer:**

21) How should team members respond when a client asks, “If no one is in the clinic all night, why can’t my pet come home the night of their surgery?”

[Note to Trainer: Do you have someone in the hospital at night to monitor patients? If not, what happens if a patient is slow to recover or experiencing postsurgical complications? Do the doctors send these patients to an emergency facility for the night?]

**Answer:**

22) Which team member discharges the surgery patients?

**Answer:**

23) What discharge instructions do clients receive?

*Sample Response: Clients are given written discharge instructions and a copy of these instructions is kept in the patient’s medical record.*

24) What does an owner need to watch for postsurgically? What are some possible complications that can occur?

**Answer:**

25) What is an Elizabethan collar (E collar)?

**Answer:**

26) Which patients are discharged with an E collar? How much do they cost?

[Note to Trainer: If you have Bite-Nots™ or other collars or harnesses, discuss and demonstrate the use of these products as well. Can owners rent collars from you or do they need to be purchased? What is the procedure when an owner rents a collar? What should team members do when an owner returns a collar?]

**Answer:**

27) What is a **seroma**?

**Answer:**

28) How are seromas managed?

**Answer:**

29) What is a **hematoma**?

**Answer:**

30) How can hematomas be avoided?

*Sample Response: Good* ***hemostasis*** *after blood collection and during surgery and careful tissue handling prevent the development of hematomas. Hematomas are also more likely to occur if the pet is too active at home following surgery.*

31) Does our practice recommend rechecking patients with seromas or hematomas postsurgically?

**Answer:**

32) How long can a bandage remain on a patient?

*Sample Response: A bandage should never be left on for more than four or five days. Always schedule a recheck if the pet is discharged with a bandage on or enter a call back to remind the owner when to remove the bandage.*

33) Who are team members encouraged to speak with if a client makes a remark about the pet not being clean or the bill being more than the estimate was (or some similar customer complaint)?

**Answer:**

34) How do we handle special diets, medications, or personal items?

**Answer:**

**MODULE 4: DENTISTRY, RADIOLOGY, AND SURGERY**

**Lesson 4: Dentistry**

[Note to Trainer: Use a dental textbook and/or pictures for this section. Additional information is available at the American Veterinary Dental College’s (AVDC) website.]

1) Why is dental care important?

**Answer: When an infection is present in the gums or around the teeth, bacteria flood into the bloodstream every time a pet eats or chews. These bacteria can then infect other organs and tissues.**

2) What percentage of pets develops dental disease?

**Answer: Eighty percent of dogs and 70% of cats over three years of age have some degree of periodontal disease (Wiggs and Loprise 1997).**

3) How often do pets need their teeth cleaned?

*Sample Response: On average, teeth need to be cleaned once a year but the exact timing will depend on the breed, size, and genetics of the pet, the pet’s regular diet, and the type of home dental care it receives, if any.*

4) When does a pet need their first dental cleaning?

**Answer:**

5) What is involved in a dental cleaning/prophylaxis?

[Note to Trainer: Describe the procedure step by step.]

**Answer:**

6) What does an **ultrasonic scaler** do?

**Answer:**

7) Why are the teeth polished after cleaning?

**Answer:**

8) What is a feline oral resorptive lesion?

**Answer:**

9) How is a feline oral resorptive lesion treated?

**Answer:**

10) What is a slab fracture?

**Answer:**

11) How is a slab fracture treated?

**Answer:**

12) What pain medications does our hospital use in animals that have one or more dental extractions?

**Answer:**

13) Does our hospital use nerve blocks for dental extractions?

**Answer:**

14) When is a dental radiograph performed?

**Answer:**

15) What is periodontal disease?

**Answer:**

16) What organs are affected by periodontal disease?

**Answer: Periodontal disease primarily affects the kidneys, liver, heart, and joints (DeBowes et al. 1996).**

17) How can clients reduce plaque and tarter build-up in their pet’s mouths?

**Answer:**

18) Explain the benefits of tooth brushing for pets as if you were speaking with a client.

**Answer:**

19) How would you demonstrate brushing a pet’s teeth to a client? Are there tricks or tips we would use?

[Note to Trainer: Demonstrate tooth brushing for trainees and have them practice so they can help the client to do the same.]

**Answer:**

20) When is a chlorhexadine/zinc rinse (or other mouth rinse) recommended?

**Answer:**

21) What other home dental care techniques are recommended to clients to prevent or treat dental disease?

[Note to Trainer: Does your practice recommend dental toys, chews, sealants, or any other dental products?]

**Answer:**

22) What other advice can a team member relay to a client to protect their pets’ teeth?

*Sample Response: Owners are advised to not give their pets bones, chew hooves, ice cubes, or rocks.*

23) When does a pet receive a dental reminder?

**Answer:**

24) How and when are the pet’s teeth graded?

[Note to Trainer: Does your practice recommend the same system as AAHA and the AVDC?]

**Answer:**

25) At what grade do team members begin recommending teeth cleaning to clients?

**Answer:**

26) Can a dental cleaning be performed at the same time as another surgery?

[Note to Trainer: Can a lump removal be performed at the same time as a dental cleaning? Can a spay and an ACL repair be performed at the same time?]

**Answer:**

27) What are some hazards associated with dental cleaning? How should we protect ourselves and our patients?

*Sample Response: Gloves, protective clothing (i.e., scrub tops), face masks, and eye protection should always be worn during dental procedures to avoid biological samples and bacteria from contacting the team member performing the procedure. For the patient, the equipment is adequately sterilized or disposed of after each use so that infectious diseases such as FeLV or an upper respiratory tract infection do not get spread from pet to pet.*

28) What safety precautions need to be employed when performing dental radiographs?

*Sample Response: Despite the lower power of dental X-ray machines, the same precautions should be taken as with regular radiographs (see the radiology lesson for more details).*

**MODULE 4: DENTISTRY, RADIOLOGY, AND SURGERY**

**Lesson 5: Radiology**

[Note to Trainer: It may be beneficial to teach this lesson in the room where radiographs are performed. Either a stuffed animal or calm dog can be used for demonstration purposes.]

1) What is the correct term for X-ray?

**Answer: Radiograph**

2) Which team members are permitted to take radiographs?

**Answer:**

3) How is the doctor notified when the radiographs are ready?

**Answer:**

4) Where are the radiographs stored (if using conventional film radiographs) after the doctor is finished? If digital radiology is used, where are the radiographic images stored and how can they be sent to other doctors or hospitals?

**Answer:**

5) Are radiographs ever signed out to clients?

[Note to Trainer: Does a CCR enter a call back to be certain the radiographs are returned? Are clients asked to sign the radiographs out?]

**Answer:**

6) Can copies of radiographs be made for the client?

**Answer:**

7) What is the primary risk associated with taking radiographs?

[Note to Trainer: What are your hospital’s safety procedures for operating the radiograph machine? Where are the written procedures stored?]

*Sample Response: Radiation is the primary risk factor for team members. Lead aprons, gloves, and thyroid collars should be worn at all times and other techniques should be employed to minimize unnecessary exposure (e.g., use the collimator to focus the primary beam to minimize scattered radiation). Studies have shown that radiation causes cancer and birth defects. Pregnant women may not want to take radiographss, especially in the first four months of pregnancy. Pregnant women should consult their physician* (Seibert 2007).

8) What is an X-ray badge (dosimeter)?

**Answer:** The badges measure how much radiation the person wearing it has been exposed to while taking radiographs. The company that reads and records the radiation exposure from the badges keeps a permanent record of each person’s lifetime exposure to radiation and reports levels of exposure to that person.

9) How are the radiographs labeled and stored?

**Answer:**

10) When would an animal require sedation to perform a radiograph?

**Answer:**

11) Does our practice sedate animals that are struggling to try to position them properly for the radiograph?

**Answer:**

**MODULE 4: DENTISTRY, RADIOLOGY, AND SURGERY**

**Lesson 6: Anesthesia and Anesthetic Safety**

1) Which team member determines the anesthetic plan for each patient? What does this entail?

[Note to Trainer: In general, an anesthetic plan includes the risk classification, a pain management plan, and an emergency drug plan. For the veterinary emergency drug calculator recommended in the AAHA Standards, visit Colorado State University’s website www.cvmbs.colostate.edu/clinsci/wing/emdrughp.html.]

**Answer:**

2) Is approval from a doctor required prior to administering any drug to a patient?

**Answer:**

3) What pain medication does our clinic stock and how are these medications used?

**Answer:**

4) What are “standard” anesthetic protocols for dogs?

**Answer:**

5) What are “standard” anesthetic protocols for cats?

**Answer:**

6) Does our hospital have an **induction chamber** available?

**Answer:**

7) When might an induction chamber be employed?

**Answer:**

8) What equipment is used to monitor anesthesia? What do each of these units measure?

**Answer:**

9) When is blood pressure measured in anesthetized pets?

**Answer:**

10) What do **intubation** and **extubation** mean?

**Answer:**

11) What would we say to a client who asked, “Why is my pet hoarse after surgery?”

**Answer:**

12) What is a **palpebral reflex**?

**Answer:**

13) How can a team member assess if an animal is **too light** or **too deep**?

**Answer:**

14) What is an **elongated soft palate**?

[Note to Trainer: Do your team members need to discuss this condition with owners of brachycephalic breeds?]

**Answer: An elongated soft palate is one that is longer than normal and extends farther down in the airway than normal. An elongated soft palate is capable of obstructing the larynx and respiration. This is a common anatomic abnormality in brachycephalic breeds.**

15) What is **laryngeal paralysis**?

**Answer: Paralysis of the arytenoids cartilages and vocal folds causing them to hang down into the airway. This problem is common in older large breed dogs and is occasionally diagnosed in cats and small dogs. Laryngeal paralysis results in noisy breathing, exercise intolerance, and dyspnea (particularly in hot, humid conditions and during exercise). Laryngeal paralysis can be diagnosed by anesthetizing the patient and evaluating the airway with a laryngoscope.**

16) What is **perfusion**?

**Answer: Perfusion is a measure of how well the circulatory system is meeting the needs of the patient. Poor perfusion means that blood flow is sluggish and cells and tissues are not getting sufficient amounts of oxygen and nutrients.**

17) How do you know if a pet has poor perfusion?

**Answer: The capillary refill time (CRT) can assess tissue perfusion. This is achieved by pressing on the gum to blanch it then counting how many seconds it takes for the gum to turn pink again. One to two seconds is normal.**

18) How is hypotension treated in ill or anesthetized pets?

*Sample Response: Intravenous (IV) fluids are administered and medications that impact blood pressure are evaluated (and, if applicable, discontinued). If the pet is under anesthesia, the anesthetic plane can be lighted and, the temperature can be checked to make sure the pet is not hypothermic, and if necessary, a dopamine drip or constant rate infusion (CRI) can be initiated.*

19) What gas anesthetic products does our hospital use?

**Answer:**

20) What are some side effects for long-term exposure to gas anesthetics?

**Answer: In the short term, drowsiness, headache, itching, and irritability are side effects of exposure to waste anesthetic gases. In the long term, birth defects, liver and kidney disease, and nervous system disorders may occur. Some studies have suggested a link between exposure to these gases and cancer (McKelvey 1999).**

21) What is a **scavenger system**?

**Answer: A suction system to evacuate waste anesthetic gasses through a tubing system to the outside of the building or a canister containing carbon that filters out the waste anesthetic gas.**

22) What safety precautions are encouraged when working with gas anesthesia?

**Answer: Monitor the anesthetic machines to ensure they are functioning properly and there are no leaks in the system. Seal the anesthetic chambers tightly and use the proper size cuffed endotracheal tube (ET) for each pet (McKelvey 1999).**

23) What safety precautions are encouraged when refilling an anesthetic machine?

**Answer: In its liquid form, anesthetics can be absorbed through the skin. Gloves should be worn and team members should wash their hands afterwards. The highest levels of contamination usually occur when the liquid anesthetic is accidentally spilled (McKelvey 1999).**

24) What hazards are associated with the use of oxygen?

**Answer: Fire and explosion are the two most common hazards associated with the use of oxygen (McKelvey 1999).**

25) What precautions are required when working with oxygen?

**Answer: No smoking, wrap wet gauze around oxygen sources when using lasers or electrocautery near an oxygen source. This is usually needed when using hot equipment in the mouth or on the face, near the ET tube.**

26) What are the risks associated with the use of **induction chambers**?

**Answer: High gas exposure to team members when removing the pet from the chamber. Pets cannot be monitored well while in the chamber.**

27) What are team members asked to do if they accidentally stick themselves with a needle while administering an anesthetic injection?

*Sample Response: Wash the wound and immediately seek medical attention if you feel weak, dizzy, or faint.*

28) Who do team members report accidents to?

**Answer:**

29) What are the consequences associated with administering an IV anesthetic outside the vein?

**Answer: Ketamine can cause burning and stinging and propofol can cause tissue sloughing. Depending on the volume injected, most IV medications can cause painful edema and bruising if administered extravascularly (i.e., outside the vein)*.***

30) How and where are anesthetic drugs stored?

**Answer:**

**Module 4 Suggested Reading**

American Animal Hospital Association. 2007. *Anesthesia Standards.* AAHA Standards. Lakewood, CO: AAHA.

American Animal Hospital Association. 2007. *Dentistry Standards. AAHA Standards.* Lakewood, CO: AAHA.

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