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ABSTRACT

Contemporary research is beginning to unpack commonalities across etiologies and risk factors between the human and canine communities for various pathologic oral lesions. Despite these commonalities, unique challenges in breeding, lifestyle experiences, diet, and environmental exposures have greatly impacted the incidence of oral cancerous lesions in “man’s best friend.” Moreover, widespread lack of owner education about the importance of oral cancer screenings often leads to a late diagnosis for the canine species. As cancerous fatalities for canines continue to accelerate, it is increasingly imperative that a deeper focus on assessments and diagnostics is developed as a critical means of controlling prognosis and subsequent treatment outcomes. This article discusses the current process of care for identifying and managing canine oral cancers.

COURSE OBJECTIVES

Upon completion of this course, the dental professional should be able to:

1. Describe common etiologies and risk factors associated with cancerous oral tumors in the canine population
2. Identify common signs, symptoms, and key indicators of canine oral cancers
3. Explore assessment and diagnostic parameters including imaging and biopsy instruments utilized to identify oral cancers in canines
4. Evaluate appropriate treatment and palliative care options for canines diagnosed with oral cancers



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Unleashing the data: Identifying oral cancers in the canine population

A PEER-REVIEWED ARTICLE | by Katrina M. Sanders-Stewart, MD, BSDH, RDH, RF

Introduction

Although dogs have been lovingly referred to as “man’s best friend,” they can also be considered “researchers’ best friends.” Beagle studies are commonly utilized when studying conditions related to human oral disease, noting that the oral microbiota of canines may be similar to that of humans.¹ Beagles are a favorable breed for research and trials due to their docile temperament and relatively small size in comparison to other breeds.

Contemporary data across canine

studies have shown compelling results that may provide critical insights into human conditions. Specifically, canines provide insight for controlled risk factors, examining a diet-controlled, lifestyle-controlled population of nonsmokers and nondrinkers that can deliver more pragmatic data that can be deeply relevant to the management of human oral disease.

This article examines the current understandings affiliated with oral cancers within the canine population and may be able to provide

critical considerations with regard to relationships in the assessment, diagnosis, planning, implementation, evaluation, and maintenance of human oral cancers.

There are 74 million dogs currently living in the United States² experiencing similar environmental and carcinogen exposure as their human owners. The average life expectancy of a domesticated dog ranges from 6.8 to 13.0 years, depending on myriad factors.³ Cancer is at least as common in dogs as it is in humans, with approximately 45% of dogs over the age of 10 years dying of cancer.⁴

As trends in canine oral tumors and cancers continue to demonstrate unique similarities to those of humans, critical study in the area of canine oral cancers is crucial. It is hoped that emerging research on the risk factors, response to various therapies, and evaluation of quality of life seen in the veterinary dental profession may offer insight into the therapy of human diseases of similar nature. This article discusses some of the common understandings of canine oral cancers and offers opportunity for reflection of veterinary data as it relates to human disease.

Epidemiology of canine oral cancers and tumors

Approximately 6%–7% of the cancers experienced by the canine population are oral in nature.⁵ The most common location of oral tumors in canines is the gingiva (24.4%), followed by the lip (14.1%) and the tongue (8.1%).⁵

In purebred dogs, oral tumors were primarily discovered in Labrador retrievers (13.0%), followed by golden retrievers (11.1%) and boxers (3.2%); however, mixed-breed dogs presented with the greatest frequency, comprising 26.0% of reported oral tumor cases.⁵

The median age in dogs diagnosed with an oral or pharyngeal neoplasm

is 9.8 years.⁶ There is an equal proportion of both male and female dogs that experience oral cancer; however, studies have demonstrated a significantly greater risk of fibrosarcomas, melanomas, and tonsillar carcinomas in male dogs.⁷

It should be noted that demographic data for the incidence of oral tumors has observed an increase in cases, which is attributed to the improvement in veterinary care including routine oral care and regular examinations for earlier diagnoses. Additionally, with increased longevity associated with optimal preventive health care, it is speculated that longer lifespans elevate the risk of development of cancer later in life.⁵

Assessment of risk factors

Similar to that of human cancers, there are often specific medical conditions or lifestyle risk factors that can contribute to elevated concerns of canine oral cancers. While traditional lifestyle factors such as tobacco habits, low consumption of fruits and vegetables, and alcohol use do not directly pertain to canine oral cancers, it should be stated that domesticated dogs experience similar living environments to that of their human owners, and as such, some similarities can be surmised.

Oral microbiota: Contributory factors of poor calculus control and inadequate toothbrushing as well as contact with a pet owner who was a smoker did not yield statistically significant differences between dogs in control groups versus case groups. However, it was noted that *Tannerella forsythia* and *Porphyromonas gingivalis* were associated with a significant increase in cases of dogs experiencing oral mucosal melanoma when compared with the control group.⁸

Viruses: As with human studies, current methodologies are looking

at papillomavirus entities as contributory factors in the elevated risk of cancers. Most notably, studies are evaluating the links between canine papillomavirus 1 (CPV-1) and oral oncological lesions.⁹ Interestingly, there are currently 14 genomed canine papillomaviruses; however, CPV-1 has rendered the greatest concern. Younger dogs (under one year of age) can develop wartlike or cauliflowerlike lesions in the oral cavity, which have oftentimes evolved to nonregressing squamous cell carcinoma.¹⁰

Obesity: Retrospective studies have evaluated the correlation between overweight status or obesity and risks for various types of cancers. While the studies are still experimental in nature, it does leverage the conversation regarding the importance of exercise and nutritional conditions in the overall risk associated with DNA-genome mutation diseases such as cancer. Additionally, cancers may be notated as a secondary condition associated with overweight or obese status, as seen in cases of orthopedic disease or insulin resistance resulting in the development of neoplasms.¹¹

Environmental: Currently, research is looking to environmental factors that may elevate the risk for the development of cancerous tumors. Theories currently being evaluated in research are looking to environmental factors such as exposure to secondary tobacco smoke within the household as well as long-term exposure to urban pollutants, which are believed to be responsible for more frequent development of oral tumors.⁵

Clinical screening

Veterinarians employ a meticulous and multidimensional approach when assessing for oral cancer in dogs, recognizing the gravity of this

affliction in canine health. A comprehensive evaluation begins with a thorough physical examination, where clinicians scrutinize the oral cavity for anomalies such as discolored lesions, ulcerations, or abnormal masses.¹² Palpation of the oral structures is paramount, aiding in the identification of subtle changes in tissue texture or swelling that may elude visual inspection alone.

In tandem with these clinical methodologies, veterinarians judiciously consider the patient’s medical history, breed predispositions, and behavioral changes indicative of oral discomfort. The integration of these diverse assessment modalities not only facilitates accurate diagnosis but also informs treatment planning, allowing for tailored interventions that prioritize the welfare of the canine patient. The amalgamation of clinical acumen, advanced diagnostic techniques, and a nuanced understanding of canine pathology underscores the veterinarian’s commitment to early detection and management of oral cancer, ultimately contributing to enhanced outcomes and improved canine well-being.

Diagnosis

Radiography and advanced imaging modalities such as computed tomography (CT)¹³ enable a detailed exploration of the extent and invasiveness of potential neoplastic lesions.¹⁴ Veterinarians may also opt for fine-needle aspiration or biopsy procedures to procure tissue samples for histopathological examination, which remains the gold standard for definitive cancer diagnosis.¹⁵ Precision and thoroughness in diagnosis serve as linchpins in the overarching endeavor to optimize treatment outcomes and elevate the standard of care for canine patients.

Signs and symptoms: Canine oral cancer presents a formidable

challenge in veterinary oncology, characterized by a spectrum of subtle yet indicative signs. An astute recognition of these manifestations is pivotal for early intervention and improved prognosis. Observable alterations in oral hygiene, including persistent halitosis, gingival inflammation, or excessive drooling, often serve as early harbingers. Oral masses—ranging from small nodules to ulcerative lesions—may manifest, prompting a meticulous examination of the oral cavity. Dogs may exhibit dysphagia, reluctance to eat, or changes in chewing habits, reflecting the discomfort associated with neoplastic growth.¹⁶

Further subtleties may emerge, such as asymmetry or swelling in the oral region, potentially indicative of tumor infiltration. Weight loss and lethargy, though nonspecific, may accompany the progression of oral malignancies. Regional lymphadenopathy, particularly in the mandibular or retropharyngeal nodes, can signal metastatic spread. Behavioral shifts,

including irritability or reluctance to be handled around the head, may underscore pain or discomfort.

Clinicians must adopt a comprehensive and systematic approach to recognize these nuanced signs, considering breed predispositions and the multifactorial nature of oral pathology in canines. Early detection of such signs is pivotal, serving as a cornerstone for timely diagnosis and the formulation of efficacious treatment strategies in the challenging landscape of canine oral cancer.

Diagnostic modalities: Canine oral cancers encompass a diverse array of malignancies affecting the oral cavity, each presenting distinct characteristics and potential challenges. Table 1 outlines various types and states of oral cancers observed in dogs.

Understanding the diverse nature of these oral cancers is crucial for accurate diagnosis, treatment planning, and improving the overall prognosis for affected canine patients. Regular veterinary checkups

TABLE 1: Clinical diagnoses in canine oral cancers^{17,18}

| Diagnosis | Description |
|---|---|
| Melanoma | Often found in the oral mucosa, melanomas are aggressive tumors derived from pigment-producing cells. |
| Squamous cell carcinoma (SCC) | Arising from the squamous epithelial cells, SCC is a common oral cancer affecting various oral structures. |
| Fibrosarcoma | Derived from fibrous connective tissues, fibrosarcomas may occur in the oral region, exhibiting infiltrative growth patterns. |
| Osteosarcoma | Osteosarcomas can affect the jawbones and oral structures, causing destructive bone lesions. |
| Fibromatous epulis | A benign oral tumor arising from periodontal ligaments, fibromatous epulis can manifest as a localized growth. |
| Ameloblastoma | Originating from odontogenic tissues, ameloblastomas are rare tumors that may affect the jawbones and surrounding structures. |
| Oral papilloma | Caused by papillomavirus infection, oral papillomas often appear as benign, wartlike growths affecting the oral mucosa. |
| Malignant peripheral nerve sheath tumor (MPNST) | Derived from nerve sheath cells, MPNSTs may occur in the oral cavity, presenting diagnostic challenges. |
| Lymphoma | While systemic, lymphoma can involve oral structures, leading to swelling and tissue infiltration. |
| Adenocarcinoma | Arising from glandular tissues, adenocarcinomas can affect salivary glands or other oral glandular structures. |

and prompt evaluation of oral abnormalities contribute to early detection and intervention.

Prognosis

The ideal care plan for the therapy of canine oral cancers requires a critical survey of identification of advancement of the cancerous lesion and subsequent prognosis of the dog's ability to respond to therapy.

In general, benign oral tumors will typically progress slowly, while malignant tumors will more rapidly enlarge and invade surrounding oral tissues. Certain cases of cancerous tumors may present locally, impacting surrounding oral structures such as the roots of teeth, bone, and other oral soft tissues. Other tumors may be very aggressive and may metastasize to lymph nodes or surrounding organ systems.

Cases of a malignant oral tumor may call for a full staging, in which the treating veterinarian will perform a search for potential spread of the tumor to other sites within the body.¹⁶ This staging can provide critical data regarding the prognosis of an oral cancer case. Full staging typically includes bloodwork, urinalysis, radiographs of the lungs, and possible ultrasound of the abdomen to screen local lymph nodes. The results of a histopathology report will provide critical data about how the tumor is likely to behave and can thus provide information about the probability of recurrence or metastasis.

Treatment plan options

The approach to pet cancer care and treatment is similar to that in humans, which may include utilizing a judicious fusion of surgical, radiation, or chemotherapy interventions. Conversely, pet cancer care may also include the use of holistic therapies based on the type of cancer, progression, location, and prognosis.

Additionally, clinical trials may provide promising treatment options.¹⁹ The complexity lies in tailoring these modalities to the specific tumor type, location, and individual patient factors, prioritizing canine well-being.

In most cases, dogs presenting in earlier stages of the cancerous tumor may be appropriate candidates for advanced therapy, including the delivery of intravenous chemotherapy and radiation. Typically, earlier stages of the cancerous process may render more optimal results; however, an average of 15% of dogs experienced local recurrence of the cancer within approximately 139 days. Median survival time following diagnosis for dogs receiving hypofractionated radiation therapy with platinum-containing chemotherapy is approximately 363 days, and it should be noted that survival times have improved from previous research findings.²⁰

Tumor treatment/surgery: The stage, location, and extent of the tumor may warrant surgical removal of tumorous growths or the freezing of tumor material via a procedure called cryosurgery. While surgery (mandibulectomy or maxillectomy) is the most common treatment for oral cancers, it typically involves not only removal of the tumor but also removal and subsequent reconstruction of the teeth, soft tissue, or bone surrounding the tumor. Flint Animal Cancer Center of the Colorado State University Veterinary School says there are four considerations to performing surgery on pets with cancer: to diagnose, to cure the pet cancer patient, to provide pain relief or improved function for the pet, or to debulk the tumor.²¹

Radiation therapy: Of note, the vast majority of pet owners who chose to treat their pets with radiation therapy were pleased with their decision, noting 92% of pet owners

were happy with the treatment and 88% of pet owners indicated they would deliver treatment again if warranted.²²

Radiation therapy is commonly used in pet cancer treatment. The localized ionizing radiation damages the DNA in the tumor cells resulting in cell death, or more commonly through oxygen-free radical formation. When radiation is used in pet cancer for a curative result, pets will commonly receive daily radiation therapy over a three- to four-week period. Used for palliative purposes, radiation therapy may be administered over the course of a few days or once a week for a limited time.

When radiation is used with a curative intent, acute side effects may occur during or shortly after treatment. New advances in radiation technology, such as the Varian Trilogy linear accelerator used at Colorado State University, can reduce the severity or possibly eliminate the side effects for tumors in some areas being treated.²³ Stereotactic radiation therapy (SRT), another form of radiation therapy, delivers radiation with surgical scalpel precision. SRT can be used for curative or palliative treatment.²³

Chemotherapy: The injection of drugs directly into a cancerous tumor can provide control over a growing tumor. Aggressive treatments such as chemotherapy or radiation treatment can express overt adverse effects, which are also managed during the course of treatment. Chemotherapy may be administered intravenously, orally, under the skin, intramuscularly, or directly into the tumor.

Unlike humans, pets do not experience as many side effects with chemotherapy. Approximately 70% of the pet population experiences little to no side effects. Grooming pets during chemotherapy may need to be

adjusted as it does slow the regrowth of hair. When side effects do occur, they are similar to those in humans, such as nausea, vomiting, diarrhea, and lowered white blood cell count.²⁴

Holistic therapies: In certain cases, a pet owner may consider the use of a variety of holistic therapies aimed at controlling or managing the symptoms of cancer or cancer treatment in canines, including herbal, mineral, and/or vitamin supplementation. This may also include nontraditional therapies such as acupuncture or even the use of medicinal mushrooms with anticancer benefits.²⁵

Palliative care options: Although perhaps considered controversial in the veterinary community, the difficult discussion in educating a pet owner about palliative care options over active therapy is one that is made based on myriad factors, including the overall health and age of the dog, the stage and prognosis of the oral cancer, and the willingness of the pet owner to consent to and subsequently manage a dog undergoing cancer therapy.

It is with dignity that pet owners, when ready, are able to assist their companions “across the rainbow bridge” through the use of euthanasia techniques. Euthanasia in the canine community can be a gentle and humane modality for ceasing the pain and suffering associated with the ramifications of oral cancer. Veterinarians have several quality of life assessments available to use in guiding this decision-making process,²⁶ and it should be noted that the choice to consent to euthanasia is ultimately that of the pet owner.

Preventive therapies

The management of risk factors becomes a critical component of the opportunity to prevent the development and/or acceleration of an oral cancer tumor. This may include details such

as weight control for the prevention of obesity and control of environmental or household carcinogens.

Specific supplements or food products may provide some support, including fish oil, animal protein, blueberries, blackberries, broccoli, pumpkin, turmeric, coconut oil, apples, sweet potatoes, beets, asparagus, green beans, and pomegranates.²⁷

Routine home care for canine teeth not only assists with the reduction of pathogenic oral bacteria, which may contribute to oral cancer tumors; it also permits the pet owners to familiarize themselves with their pet's mouth, thus providing an earlier opportunity to identify changes in the tissue or new odors that may warrant further testing. Additionally, routine dental examinations and therapies by a licensed veterinarian will permit routine oral cancer screenings, which may aid in earlier detection.

Environmental conditions can also contribute to cancer risk, most notably in outdoor yards treated with pesticides. Interestingly, pets have been utilized as a means of screening for potential environmental carcinogens for many years.²⁸

Humans who believe there may be a carcinogen contaminant in their home can have the bloodwork of their dog evaluated for air, food, and/or water contaminants in their home, and thus learn about opportunities to control these environmental factors.²⁸ As such, additional preventive modalities may include acquiring bloodwork to identify environmental factors that may contribute to the development of cancer.

Finally, research is currently considering the use of a canine oral melanoma vaccine as a means of primary prevention.²⁹ Research is also evaluating the efficacy of this vaccine as a treatment adjunct in dogs currently being treated for oral melanoma.

Evaluation

Long-term outcomes in the management of canine oral cancers hinge on early detection, comprehensive treatment, and vigilant posttherapy monitoring. Surgical interventions, often the primary approach, aim for complete tumor excision, enhancing survival rates when coupled with precise diagnostic insights. Adjuvant therapies such as radiation and chemotherapy further bolster treatment efficacy. However, the prognosis is intricately tied to factors such as tumor type, stage, and inherent biological variations.

Regular follow-ups are imperative, allowing veterinarians to detect recurrences or metastases promptly. While some cases showcase prolonged remission and enhanced quality of life, others may necessitate ongoing palliative care.

The evolving landscape of veterinary oncology underscores the significance of tailored, multimodal strategies, emphasizing both curative and palliative aspects. Advanced imaging and molecular diagnostics continue to refine prognostic accuracy, fostering a more personalized and optimistic outlook. Long-term success in canine oral cancer management intertwines medical expertise, caregiver commitment, and the resilience of our canine companions, reaffirming the pursuit of extended, meaningful lives for our beloved four-legged friends.

Conclusion

The relevance of studying canine oral cancers cannot be denied. The critical survey of canine cancers has impacted the understanding of human cancers of the head and neck. Contemporary research is looking to canine cancers to better understand the increase in prevalent nonsmoker, nondrinker cancers in humans. The spontaneity of this disease in patients

without the common risk factors of tobacco and alcohol habits lends itself to optimal study patterns, evaluating how canine cancers can perhaps shed light on the origin of cancer and even evaluating specific lifestyle risk patterns that may be observed across the canine population and into humans.³⁰

In addition, dogs provide optimal abilities to understanding genome associations, as they often deliver large and multiple litters, which can provide a powerful system for linkage studies.³¹ Finally, dogs frequently demonstrate the same precursor syndromes that humans experience prior to the detection of metastatic tumors, which certainly provides critical data to understanding key components of the formation and subsequent development of human tumors.



AUTHOR'S NOTE: This article is dedicated in loving memory of my late father's best friend, Maverick Sanders (1/1/2010–6/11/2022), a loyal companion and cherished friend, whose spirit lives on in our hearts forever. Maverick's fight through canine oral cancer was the inspiration for this educational content.

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QUESTIONS

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- What is the most common location of canine oral cancers?
 - The gingiva
 - The palate
 - The lips
 - The tongue
- Why are dog studies commonly used in research related to human oral disease?
 - Dogs have similar lifestyles to humans.
 - Dogs are more prone to oral cancers.
 - The oral microbiota of dogs is similar to that of humans.
 - Dogs are easy to train for research.
- What percentage of dogs over the age of 10 years is reported to die of cancer?
 - 20%
 - 30%
 - 45%
 - 60%
- Which breed has the greatest frequency of reported oral tumor cases?
 - Labrador retrievers
 - Golden retrievers
 - Boxers
 - Mixed-breed dogs
- At what age do younger dogs develop wartlike observations linked to squamous cell carcinoma?
 - 6 months
 - 1 year
 - 2 years
 - 3 years
- What is the median age in dogs diagnosed with an oral or pharyngeal neoplasm?
 - 5 years
 - 8 years
 - 11 years
 - 5 years
- What contributes to the increase in reported cases of oral tumors in dogs?
 - Improved veterinary care
 - Lack of routine oral care
 - Increased exposure to urban pollutants
 - Shorter lifespans
- What are the contributory factors associated with *Tannerella forsythia* and *Porphyromonas gingivalis* in dogs with oral mucosal melanoma?
 - Poor calculus control and inadequate toothbrushing
 - Exposure to secondary tobacco smoke
 - Lack of physical exercise
 - High consumption of fruits and vegetables
- How is canine papillomavirus 1 (CPV-1) linked to oral oncological lesions in dogs?
 - CPV-1 causes oral tumors directly.
 - CPV-1 leads to the development of melanomas.
 - CPV-1 may evolve into squamous cell carcinoma.
 - CPV-1 has no association with oral cancers.
- What is one environmental factor believed to contribute to more frequent development of oral tumors in dogs?
 - Exposure to sunlight
 - Long-term exposure to urban pollutants
 - Consumption of processed foods
 - Lack of exercise
- How do veterinarians assess for oral cancer in dogs?
 - Only through visual inspection
 - Physical examination and diagnostic imaging
 - Blood tests and genetic analysis
 - Behavioral observation only
- What is the gold standard for definitive cancer diagnosis in dogs?
 - Radiography
 - Physical examination
 - Fine-needle aspiration or biopsy
 - CT scan
- What are the three primary modalities used in the treatment of canine oral cancers?
 - Surgery, acupuncture, and chemotherapy
 - Radiation, holistic therapies, and surgery
 - Surgery, radiation, and chemotherapy
 - Palliative care, surgery, and environmental control
- Which treatment option is considered controversial in the veterinary community?
 - Surgery
 - Radiation therapy
 - Holistic therapies
 - Palliative care
- What is the purpose of full staging in the diagnosis of oral cancer in dogs?
 - To identify the breed of the dog
 - To determine the cause of cancer
 - To search for potential spread of the tumor
 - To assess the dog's overall health
- What is the median survival time following diagnosis for dogs receiving hypofractionated radiation therapy with platinum-containing chemotherapy?
 - 180 days
 - 275 days
 - 363 days
 - 450 days
- What is the primary goal of radiation therapy in canine cancer treatment?
 - To induce hair loss in dogs
 - To provide control over a growing tumor
 - To eliminate side effects of chemotherapy
 - To promote tumor growth
- How is chemotherapy typically administered in dogs?
 - Orally
 - Through intravenous injection
 - Injection into the tumor
 - Topical application
- What are some potential side effects of chemotherapy in dogs?
 - Increased appetite and weight gain
 - Nausea, vomiting, and diarrhea
 - Improved coat quality
 - Elevated white blood cell count
- What is one holistic therapy mentioned for managing the symptoms of cancer or cancer treatment in canines?
 - Herbal supplementation
 - Radiation therapy
 - Surgery
 - Bloodwork analysis
- What is considered a critical component of the opportunity to prevent the development of an oral cancer tumor in dogs?
 - Regular exercise
 - Weight control
 - Exposure to sunlight
 - High consumption of processed foods

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PROVIDER INFORMATION

Dental Board of California: Provider RP5933.
Course registration number CA code: 3-5933-22346.
Expires 7/31/2024.

"This course meets the Dental Board of California's requirements for three (3) units of continuing education."



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AADH code: AADHEBM-308-4-2025-3

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22. How might routine home care for canine teeth contribute to early detection of oral abnormalities?

- A. It prevents the development of tumors.
- B. It reduces pathogenic oral bacteria.
- C. It causes changes in tissue texture.
- D. It provides genetic insights.

23. How do humans use dogs to screen for potential environmental carcinogens?

- A. Dogs receive bloodwork to identify contaminants.
- B. Dogs undergo surgery for cancer prevention.
- C. Dogs participate in clinical trials for cancer research.
- D. Dogs are monitored for changes in behavior.

24. What is the primary purpose of a canine oral melanoma vaccine?

- A. To cure existing tumors
- B. To manage symptoms of cancer
- C. To prevent oral cancers
- D. To eliminate side effects of chemotherapy

25. What is the main focus of the evaluation section in this course?

- A. Long-term outcomes in the management of canine oral cancers
- B. Environmental factors contributing to cancer risk
- C. Diagnostic modalities for canine oral cancers
- D. Epidemiology of canine oral cancers

26. Why is early detection considered crucial in the management of canine oral cancers?

- A. To reduce the need for surgery
- B. To enhance survival rates
- C. To eliminate the need for chemotherapy
- D. To minimize the risk of recurrence

27. What factors are intricately tied to the prognosis of canine oral cancers?

- A. Breed and gender
- B. Age and lifestyle factors
- C. Tumor type, stage, and biological variations
- D. Treatment modality and owner commitment

28. Why are regular follow-ups imperative in the management of canine oral cancers?

- A. To monitor the progression of tumors
- B. To detect recurrences or metastases promptly
- C. To assess the dog's overall health
- D. To provide palliative care

29. What does the evolving landscape of veterinary oncology emphasize in the management of canine oral cancers?

- A. Surgical interventions
- B. Curative aspects only
- C. Tailored, multimodal strategies
- D. Palliative care options

30. How has the study of canine oral cancers impacted the understanding of human cancers of the head and neck?

- A. It has no impact on human cancer research.
- B. It has provided insights into nonsmoker, nondrinker cancers.
- C. It has increased the prevalence of tobacco use.
- D. It has only focused on genomic associations in humans.

Unleashing the data: Identifying oral cancers in the canine population

| | | | |
|----------------------|---------------------|-----------------------------|----------|
| NAME: | TITLE: | SPECIALTY: | |
| ADDRESS: | EMAIL: | AGD MEMBER ID (IF APPLIES): | |
| CITY: | STATE: | ZIP: | COUNTRY: |
| TELEPHONE (PRIMARY): | TELEPHONE (OFFICE): | | |

REQUIREMENTS FOR OBTAINING CE CREDITS BY MAIL/FAX: 1) Read entire course. 2) Complete info above. 3) Complete test by marking one answer per question. 4) Complete course evaluation. 5) Complete credit card info or write check payable to Endeavor Business Media. 6) Mail/fax this page to DACE.

If you have any questions, please contact dace@endeavorb2b.com or call (800) 633-1681. A score of 70% or higher is required for CE credit.

COURSE CAN ALSO BE COMPLETED ONLINE AT A LOWER COST. Scan the QR code or go to dentalacademyofce.com to take advantage of the lower rate.



EDUCATIONAL OBJECTIVES

- Describe common etiologies and risk factors associated with cancerous oral tumors in the canine population
- Identify common signs, symptoms, and key indicators of canine oral cancers
- Explore assessment and diagnostic parameters including imaging and biopsy instruments utilized to identify oral cancers in canines
- Evaluate appropriate treatment and palliative care options for canines diagnosed with oral cancers

COURSE EVALUATION

- Were the individual course objectives met?
Objective #1: Yes No Objective #3: Yes No
Objective #2: Yes No Objective #4: Yes No

Please evaluate this course by responding to the following statements, using a scale of Excellent = 5 to Poor = 0.

- | | | | | | | |
|--|-----|----|---|---|---|---|
| 2. To what extent were the course objectives accomplished overall? | 5 | 4 | 3 | 2 | 1 | 0 |
| 3. Please rate your personal mastery of the course objectives. | 5 | 4 | 3 | 2 | 1 | 0 |
| 4. How would you rate the objectives and educational methods? | 5 | 4 | 3 | 2 | 1 | 0 |
| 5. How do you rate the author's grasp of the topic? | 5 | 4 | 3 | 2 | 1 | 0 |
| 6. Please rate the author's effectiveness. | 5 | 4 | 3 | 2 | 1 | 0 |
| 7. Was the overall administration of the course effective? | 5 | 4 | 3 | 2 | 1 | 0 |
| 8. Please rate the usefulness and clinical applicability of this course. | 5 | 4 | 3 | 2 | 1 | 0 |
| 9. Please rate the usefulness of the references. | 5 | 4 | 3 | 2 | 1 | 0 |
| 10. Do you feel that the references were adequate? | Yes | No | | | | |
| 11. Would you take a similar course on a different topic? | Yes | No | | | | |

12. If any of the continuing education questions were unclear or ambiguous, please list them.

13. Was there any subject matter you found confusing? Please describe.

14. How long did it take you to complete this course?

15. What additional dental continuing education topics would you like to see?

Mail/fax completed answer sheet to:

Endeavor Business Media

Attn: Dental Division; 7666 E. 61st St. Suite 230, Tulsa, OK 74133
Fax: (918) 831-9804

Payment of \$69 is enclosed (this course can be completed online for \$39. Scan the QR code or go to dentalacademyofce.com to take advantage of the lower rate).

Make check payable to Endeavor Business Media

If paying by credit card, please complete the following:

MC Visa AmEx Discover

Acct. number: _____

Exp. date: _____ CVC #: _____

Billing address: _____

Charges on your statement will show up as Endeavor.

- | | |
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| 1. (A) (B) (C) (D) | 16. (A) (B) (C) (D) |
| 2. (A) (B) (C) (D) | 17. (A) (B) (C) (D) |
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| 10. (A) (B) (C) (D) | 25. (A) (B) (C) (D) |
| 11. (A) (B) (C) (D) | 26. (A) (B) (C) (D) |
| 12. (A) (B) (C) (D) | 27. (A) (B) (C) (D) |
| 13. (A) (B) (C) (D) | 28. (A) (B) (C) (D) |
| 14. (A) (B) (C) (D) | 29. (A) (B) (C) (D) |
| 15. (A) (B) (C) (D) | 30. (A) (B) (C) (D) |

CUSTOMER SERVICE: (800) 633-1681

EXAM INSTRUCTIONS. All questions have only one answer. If mailed or faxed, grading of this examination is done manually. Participants will receive confirmation of passing by receipt of a Verification of Participation form. The form will be mailed within two weeks after receipt of an examination.

COURSE EVALUATION AND FEEDBACK. We encourage participant feedback. Complete the evaluation above and e-mail additional feedback to Rachel McIntyre (rmcintyre@endeavorb2b.com) and Laura Winfield-Roy (lwinfield@endeavorb2b.com).

COURSE CREDITS AND COST. All participants scoring 70% or higher on the examination will receive a verification form for three (3) continuing education (CE) credits. Participants are urged to contact their state dental boards for CE requirements. The cost for courses ranges from \$20 to \$110.

CANCELLATION AND REFUND POLICY. Participants who are not 100% satisfied can request a refund by contacting Endeavor Business Media in writing.

RECORD KEEPING. Endeavor Business Media maintains records of your successful completion of any exam for a minimum of six years. Please contact our offices for a copy of your CE credits report. This report, which will list all credits earned to date, will be generated and mailed to you within five business days of receipt.

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Dental Board of California: Provider RP9833. Course registration number CA code: 3-6933-22346. Expires 7/31/2024.

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