



## **RADIOGRAPH SET REQUIREMENTS**

### **Information for Equine Residents**

The AVDC Equine Training Program and Credentials Requirements include submission of a full-mouth radiograph set of an equine mouth and nose. This document provides information on how to take, process and submit a copy in a format that can be readily reviewed.

1. The radiographs must show the complete crown and all roots of all teeth (with the exception that first premolar teeth may be missing). The radiographs are to include 5 mm of the tissue adjacent to the apex of each root and with no root structures 5 mm or less from the film/image edge. There are no restrictions on intraoral or extraoral technique, as long as each tooth is imaged. Intraoral images of the canine teeth should be included in a bisecting angle technique along with extra oral images. If a cadaver is missing canine teeth, an additional cadaver or live horse may be substituted for canine images. When necessary, more than one radiograph of a tooth may be submitted. Include in the label a description of why an additional radiograph is indicated. The sinus structures (frontal, conchal and maxillary) should be included in the lateral, dorsoventral and lateral dorsoventral oblique views of the skull.
2. The maximum number of views that may be submitted as part of a digital image radiograph set is 30. Each radiograph is to be labeled as an extraoral or an intraoral view, describing which tooth/teeth are being evaluated. The description of the positioning should be used as described in the publication "A Standardized Nomenclature for Radiographic Projections Used in Veterinary Medicine" Smallwood Et Al. Veterinary Radiology Vol. 26, No. 1, 1985; pp 2-9. See example radiograph set for these descriptions.
3. The positioning (e.g. root length), exposure, and processing are to be optimal. Note: Radiographs that are correctly positioned but of poor exposure or that have other technical defects will not be approved.
4. Mounting: The radiographs are to be mounted using "labial mounting", with "Left" and "Right" stated on the mounted set:
  - images of teeth from the patient's left side are to be mounted on the right side of the radiograph and vice versa.
  - crowns of the maxillary teeth are to point down, crowns of the mandibular teeth are to point up.
5. Use of a cadaver (must be whole-head, with jaws intact and all soft tissue present) is **recommended**. Label the radiographs: Cadaver, species, age and breed if known. Please note that, if a radiograph set is not approved, individual views that were not adequate can be re-taken and swapped into the set for submission as a new radiograph set; AVDC recommends keeping the original cadaver in a freezer in case it is needed for additional views. If a sedated patient was used for the radiographic set, this same patient would have to be used for subsequent re-takes of specific views that were not approved, or the resident could submit a full radiographic set of a different patient/cadaveric specimen.
6. Radiographic images produced by digital dental imaging systems are permitted.

7. An informational document ('Equine Radiographic Technique Description') and examples of approved radiograph sets are available on the online *Information for Registered Residents* page; scroll down to the *Radiograph Set* section and click on the links.
8. Radiograph sets must not contain labels or other information that could identify the resident who submitted the set or hospital from which they were submitted.

### **Submitting a Radiograph Set**

The quality of the image must be sufficient to ensure that zooming in to view parts of the image during review will not result in unacceptable loss of image quality. High quality files (.tiff, .jpg, .pdf files or images embedded in a Word.doc file) are recommended – see details, below. Transfer for submission as an Acrobat.pdf format file is permitted – however, use the High Quality Print setting in Adobe Acrobat to avoid pixilation of the radiographs. Do NOT save word document as a pdf file...the labeling and images will be altered when saving. Use the print function only for pdf images.

Maximum file size permitted as a DMS submission is 50 MB.

DMS submissions may consist of images produced by:

- A digital dental radiographic system.

The images should be submitted as a Word or PDF document.

Name the file: *YourLASTNAME,FirstName RadSet Equine* for example: *ROENTGEN,William RadSet Equine*.

Submissions are to be made via DMS – log into DMS, click the Begin New Document link on the right side of the *Welcome* screen, click Equine Radiograph Set and then upload the file by clicking Attach File on the top command line. Once the file is uploaded (you will see the file names in the document screen below the wide blue line), be sure to click the Submit this Document box in the yellow window on the right of the document screen and then click **Save Changes** in the top command line before exiting the document.

### **AVDC Process Following Submission**

1. All radiograph sets will be evaluated blindly. Each radiograph set is assigned a code number by the Executive Secretary, and will be identified to the Credentials Committee members only by this number.
2. Comments and recommendations are forwarded by the review team members to the Chair of the Committee. If two members recommend approval, the radiograph set is approved. If one member recommends approval and one does not, the Chair reviews the radiograph set and the reviewers' comments, and casts a deciding vote. To view a copy of the AVDC Radiograph Set Evaluation Form, click *Cred Comm Radiograph Set Review Form* in the Radiograph section of the *Information for Registered Residents* web page.
3. The Credentials Committee may, at its discretion, request clarification if there are specific issues that would otherwise prevent approval of a radiograph set. In this case, a final decision will be withheld until a response to the '**Action Required**' DMS email notification is received from the resident.
4. For radiograph sets that are Not Approved, the Committee prepares a list of major reasons for non-approval.
5. The resident is informed of the results of the review by the Executive Secretary.
6. The AVDC will, whenever possible, report the results of the review within 4 weeks
7. of receipt of the radiograph set.

**If a radiograph set is Not Approved, the specific views that were inadequate can be retaken and swapped into the set. The revised set can then be submitted as a new radiograph set.**

### **Rebuttal Option**

Following receipt of a non-approval decision, the resident may submit a rebuttal, which is to include reasons why the resident considers each of the **major** concerns listed by the Credentials Committee to be inappropriate. A **maximum of 30 days** is permitted for receipt by the Executive Secretary of a Rebuttal of a non-approved radiograph set decision.

A **rebuttal** is not considered an appeal by AVDC, and is sent to the members of the review team who originally reviewed the item. The decision on the rebuttal will be made as for any other item submitted to the Credentials Committee.

If the rebuttal does not result in approval of the item, the resident has the right to request that the original item and the rebuttal are considered as an Appeal of an Adverse Decision, which will be handled according to AVDC appeals procedures noted below.

### **Appeal**

At any point in the process following receipt of an adverse decision on any item reviewed by AVDC, the resident may elect to submit a formal Appeal to AVDC. **The appeal must be received within 20 days of notification of the adverse decision.** The AVDC Appeal Policy is available in the *Appeals* section of the *Information for Registered Residents* web page. The appeal 20 day deadline does not start if a rebuttal is submitted.

## **DENTAL RADIOGRAPHIC TECHNIQUES FOR THE HORSE**

This document is provided as an informational resource for AVDC Equine residents who are generating an equine dental radiograph set for Credentials Committee review. It is not intended to be a comprehensive guide to equine dental and nasal radiography. It is a companion document to the Radiograph Requirement – Information for Equine Residents file, which is available in the Radiology section of the Information for Registered Residents page and the Equine Training Program Information page of the AVDC web site. Further an example of a passing radiograph set is also available in DMS in the Radiograph set Submission Guidelines section.

### **Standard Views**

#### **Occlusal Intraoral Views of the Maxillary Incisor and Canine Teeth –Bisecting Angle Technique**



The imaging plate/sensor is placed in the mouth so that the edge of the plate/sensor is contacting the mesial aspect of the maxillary 2<sup>nd</sup> premolars. In some cases, the direct digital (DR) sensor can be turned 45 degrees, so that the corner of the sensor is advanced between the maxillary cheek teeth.

The central beam is directed 90 degrees to the plane that bisects the angle between the incisor reserve crown-root and the imaging plate. Due to the curvature of the incisors, the reserve crown-root, rather than the clinical crown, is used to determine the angle between the tooth and the imaging plate/sensor.

**Oblique Views** are obtained by shifting the radiograph generator 15 degrees laterally and directing the central beam on the maxillary 3<sup>rd</sup> incisor.



### **Lateral Extraoral View of the Maxillary Canine Teeth**

The plate/sensor is positioned on the side of the head, with the diastema between incisors and cheek teeth centered.

As a straight lateral view will superimpose the right and left canine teeth, the central beam is directed in either a slight rostrocaudal (or caudorostral) direction and/or a slight ventrodorsal (or dorso-ventral).

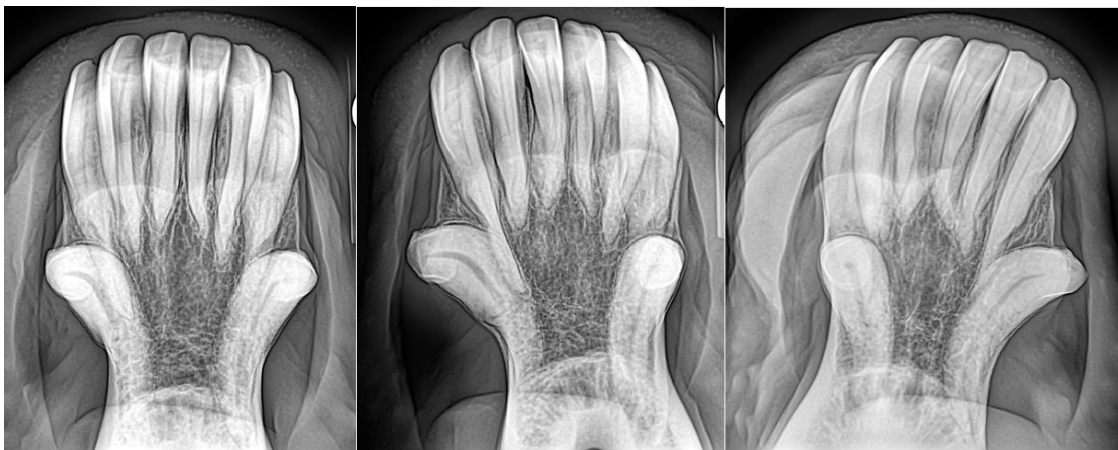


### **Occlusal Intraoral Views of the Mandibular Incisors and Canine Teeth, Bisecting Angle Technique**

The plate/sensor is placed in the mouth to the level of the mesial edge of the mandibular 2<sup>nd</sup> premolars. Adequate sedation is used to prevent chewing motion.

The central beam is directed perpendicular to the imaginary line that bisects the angle formed by the reserve crown-root of the incisors.

The oblique occlusal views are obtained by moving the generator 15-30 degrees left or right, centering the beam on the 3<sup>rd</sup> incisors.

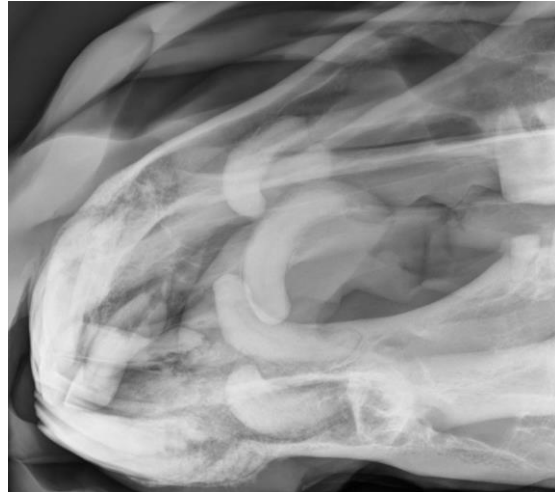


### **Lateral Extraoral View of the Mandibular Canine Teeth**

The plate is positioned on the side of the horse's head, with the mouth open or closed.

The central beam is directed as the diastema between the incisors and cheek teeth. Separation of the reserve crown-root of the mandibular 3<sup>rd</sup> incisors and canine teeth will vary, and it may not always be possible to isolate the canine tooth root.

A slightly (10-30 degree) VD or DV oblique or rostrocaudal or caudorostral oblique angle may improve isolation of the mandibular canine teeth.



### **Maxillary Cheek Teeth: Extraoral Views (Orthogonal Projections)**

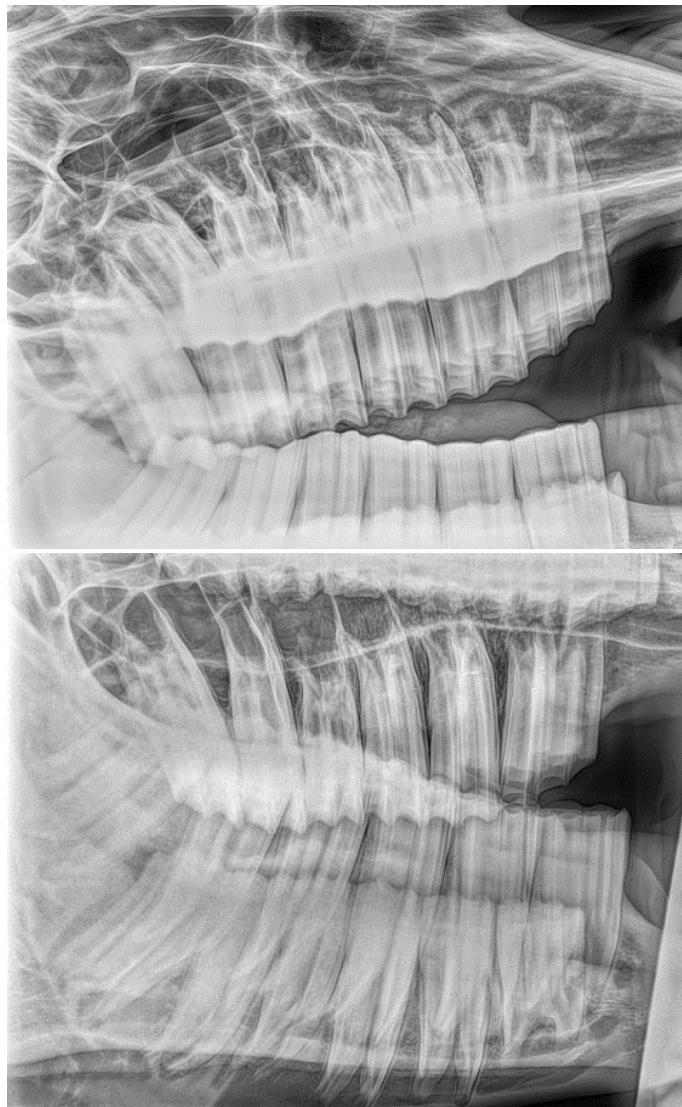
The mouth is opened widely with a speculum or an incisor bite block

The plate/sensor is placed on the side of the head, with the center over the rostral aspect of the facial crest.

The central beam is 30 degrees dorsal to the plane of the palate for the dorsoventral projection, and 45 degrees ventral to the plane of the palate for the ventrodorsal projection.

This angle may be adjusted to >45 degrees in the younger horse, so that the apices of the cheek teeth are not superimposed on the crowns of the contralateral arcade. Note that this is the same positioning for imaging the ipsilateral mandibular cheek teeth apices.

Similarly, the crowns of the ipsilateral mandibular cheek teeth are usually projected in the D30V projection of the maxillary cheek teeth.



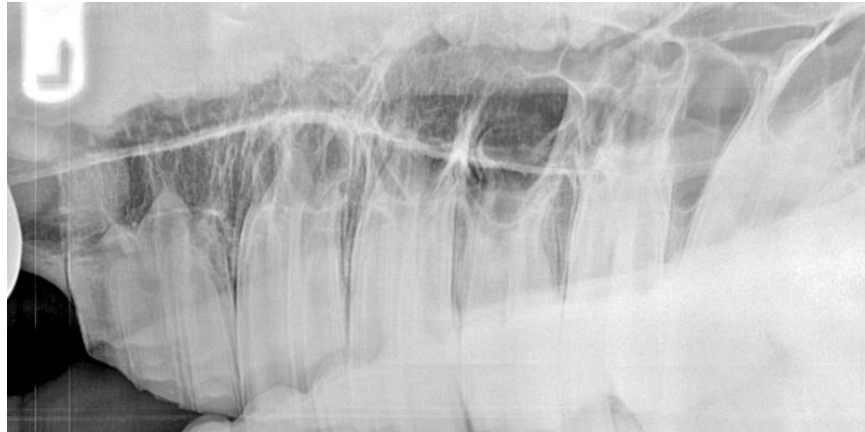
### **Maxillary Cheek Teeth: Intraoral View (Bisecting Angle, Orthogonal Projection)**

The mouth is maintained in an open position with a full mouth speculum.

The indirect radiography (CR) plate (4x8 inches) is placed on the occlusal aspect of the cheek teeth and against the palate.

The central beam is directed perpendicular to the plane that bisects the angle formed by the long axis of the tooth and the imaging plate.

In the young horse, the bisecting angle technique may project the apices off the imaging plate, and the image will have to be purposefully foreshortened to include the apices and 5 mm of apical alveolar bone.



### **Mandibular Cheek Teeth: Extraoral Views (Orthogonal Projections)**

The mouth is opened fully with a speculum or bite block. The plate/sensor is placed on the side of the horse's head, with the center of the plate over the rostral end of the facial crest.

The clinical crowns of the mandibular cheek teeth are imaged by directing the central beam 10-30 degrees to the plane of the palate in a dorsoventral direction, as previously described for the DV view of the maxillary cheek teeth. With the plate/sensor on the horse's left side, this would image the crowns of the left mandibular cheek teeth, and the image would be presented with the rostral cheek teeth to the viewer's left.

To image the apices of the mandibular cheek teeth, the central beam is directed in a ventrodorsal direction, 45-60 degrees to the plane of the palate, as previously described for imaging the apices of the maxillary cheek teeth. With the plate/sensor on the horse's left side, this view would be presented with the horse's rostral cheek teeth on the viewer's left.

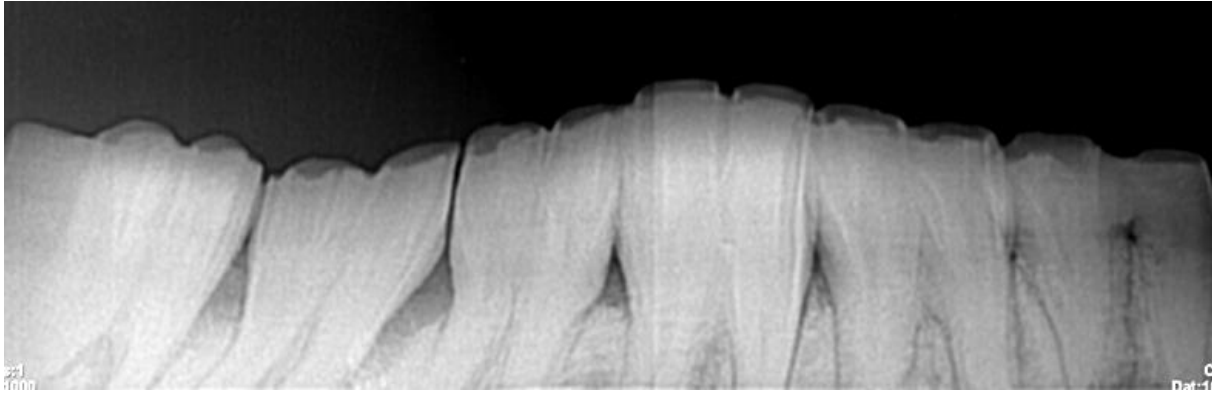


### **Mandibular Cheek Teeth, Intraoral Imaging (Parallel Technique, Orthogonal Projection)**

The mouth is opened with a speculum, and the horse must be sedated adequately to eliminate tongue movement.

The CR plate (2-3 x 8 inches) is placed between the tongue and the mandibular cheek teeth.

The beam is directed perpendicular to the plane of the plate. Slight (5-10 degree) ventrodorsal obliquity will increase the amount of reserve crown-root imaged.



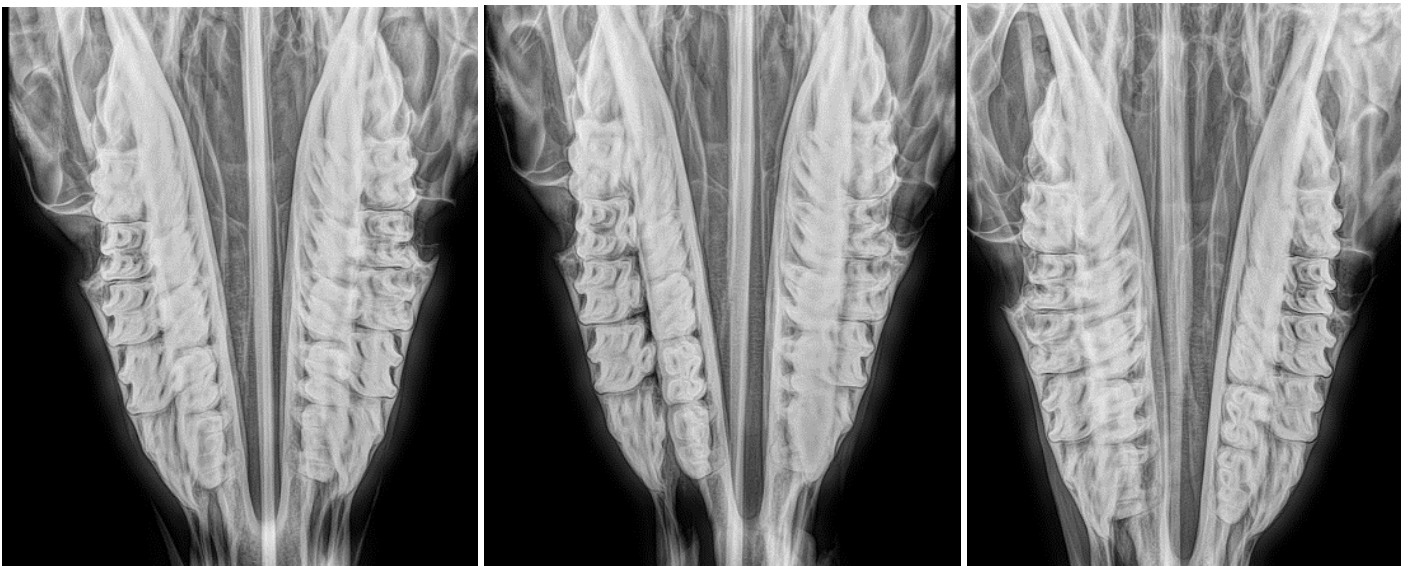
### **Dorsoventral Views**

The mouth is closed for these projections.

The plate/sensor is placed under the head, flat against the ventral aspect of the mandibles.

Central beam is directed perpendicular to the plane of the palate, centered on the line connecting the rostral end of the right and left facial crests.

The offset mandible views are obtained with similar positioning, except that the mandible is held to the left or right.



### **Lateral (Sinus) View**

The mouth can be closed or open for this view.

The plate or sensor is placed on the side of the head, with the center of the plate over the rostral end of the facial crest, insuring that adequate plate is available for imaging the dorsal aspect of the head.

The central beam is directed perpendicular to the plane of the plate/sensor, at the level of the rostral end of the facial crest.



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