European Veterinary Dental College

EVDC Training Support Document

Preparation of Radiograph Sets (Cat and Dog)

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Introduction

The EVDC entry requirements require the submission of dental and temporomandibular joint (TMJ) radiograph sets for both the cat and dog, as described in the EVDC Guide to Radiograph Requirement document. The following descriptions are intended to aid production of suitable images for submission.

General guidance

EVDC Applicants and Residents/trainees are directed to read the current EVDC Constitution and Bylaws and the Guide to Radiograph Submission which applies to their training programme before they continue reading this document.

A few points listed here as a reminder:

- All radiographs included in a set must be obtained during a single session.

- It is recommended to choose 3 to 4 year old animals with normal mesaticephalic anatomy from which to obtain both the dental and TMJ radiographs.

- Do not waste time by trying to obtain a dental radiograph series from a brachycephalic animal. It is very unlikely that you will be able to adequately isolate some teeth so the series will not be approved.

- Check that there is full dentition present (see the Guide to Radiograph Requirement for exceptions).

- Use of a cadaver is permitted if necessary. This eliminates anaesthetic time pressure and ethical issues regarding obtaining radiographs from patients for non-clinical purposes.

- If a cadaver is used it must be prepared as though it is an anaesthetised patient, including placement of an endotracheal tube.

Also note that:

- All references to "film" in the text should be read as "film or other sensor".

- It is recommended to use as large a film/sensor size as possible to include several teeth in each image and ensure that the entirety of the teeth being examined and all necessary surrounding detail can be included in the image.

- Films should be kept flat for all views. Curvature results in image distortion.

- It helps to lay the films on a thin sheet of Perspex or other rigid plastic (e.g. pieces cut from a rigid CD case) or a tongue depressor to prevent bending of the film. It is possible to prevent pressure damage to films from tooth contact by sandwiching the film between two such sheets of Perspex.

- Paper towel, sponges, sandbags and other positioning aids will be required to maintain animals and films in position for some views.

- When left and right views are required, these should ideally be near mirror images if the anatomy is bilaterally symmetrical.

Standard Dental Views for the Dog

The descriptions below are based on having the animal placed in sternal recumbency for imaging the maxillary dentition and dorsal recumbency for imaging the mandibular dentition. If lateral recumbency is preferred, the techniques can be modified accordingly.

Maxillary dentition

Position the dog in sternal recumbency, with a sandbag under the chin supporting the head. For each view, adjust the position so that the hard palate is maintained in a horizontal plane. In practise, it is not essential to maintain the palate in the horizontal plane; however, this helps to avoid any rotation of the head to left or right

1. **Rostro-caudal bisecting angle view of the maxillary incisor teeth, including the canine teeth.**
   This view provides a slightly magnified anatomically accurate representation of the incisor tooth roots. The incisor tooth crowns will be slightly foreshortened.
   The canine teeth will not be ideally represented due to their different root angulations compared with the incisor teeth and due to superimposition of other teeth over the images of their roots. The canine teeth must be fully included in this view but will not be otherwise assessed. *Clinically it is necessary to obtain slightly oblique rostro-caudal views to assess the canine teeth accurately but those views are not required in a radiograph set submitted to fulfil EVDC credentials requirements.*

   a. Open the mouth and place a suitably sized film between the crowns of the canine teeth.

   b. Both maxillary canine crown tips should be touching the film with the majority of the film extending symmetrically into the oral cavity whilst ensuring that enough of the film projects rostrally to capture the entire lengths of the incisor teeth.

   c. If one canine tooth is shorter than the other, use a radiolucent positioning aid to pack up the shorter crown until it approximates the height of the longer crown.

   d. Looking from lateral (either left or right as convenient), visualise an angle between the long axis of the incisor teeth and the plane of the film.

   e. Bisect that angle with an imaginary line.

   f. Bring the cone of the x-ray machine as close as possible to the maxilla dorsally, with the central beam aligned with the mid sagital plane of the dog.

   g. Keeping the central beam aimed at the midline, rotate the head of the x-ray machine in the sagital plane until the central x-ray beam is directed perpendicular to the imaginary line bisecting the tooth/film angle. *If the end of the cone of the x-ray machine is perpendicular to the central x-ray beam, the end of the cone will be parallel to and close to the bisecting line.*

   h. The central beam should remain aligned with the midline of the dog.

   i. The teeth to be imaged need to fall, and be centred, within the circumference of the cone, with >=3mm of surrounding tissue also included to permit detection of adjacent pathology.

2. **Lateral bisecting angle views of the maxillary canine and rostral premolar teeth.**
   This is a true orthogonal lateral projection of the canine tooth. The x-ray beam is in the transverse plane of the head; this is not an oblique view. However, the apex must be clearly visible with >=3 mm around the apex with no significant superimpositions with other structures (teeth, mandibular cortex, vomer etc.), so, where this is not achieved with a straight lateral view, a lateral oblique view should be used. If the premolars are not correctly represented on the canine view then an additional film should be included in the set to show them. The third incisor tooth may be better represented on this view than on the previous view.

a. Open the mouth and place a suitably sized film between the crowns of the canine teeth rostrally and the crowns of the premolar teeth caudally, so that the film is nearly parallel to the hard palate.

b. Both maxillary canine crown tips should be touching the film, with that of the tooth that is being imaged near the corner of the film and with the majority of the film extending caudally into the oral cavity.

c. If one canine tooth is shorter than the other, use a radiolucent positioning aid to pack up the shorter crown until it approximates the height of the longer crown.

d. Looking rostro-caudally into the oral cavity, visualise the angle between the long axis of the maxillary canine tooth and the plane of the film.

e. Bisect that angle with an imaginary line.

f. Bring the cone of the x-ray machine as close as possible to the maxilla, directing the central x-ray beam horizontally, perpendicular to the sagittal plane of the head.

g. Keeping the central beam in the transverse plane, rotate the x-ray head until the central x-ray beam is perpendicular to the imaginary bisecting line. *If the end of the cone of the x-ray machine is perpendicular to the central x-ray beam, the end of the cone will be parallel to and close to the bisecting line.*

h. The canine tooth needs to fall within the circumference of the cone, with >=3mm of surrounding tissue also included to permit detection of adjacent pathology.

i. Note the positioning and beam angulation as these can be used as a guide when imaging the opposite side.

3. **Lateral bisecting angle view of the remaining premolars and molars.**
This view will not isolate all tooth roots but will provide an anatomically accurate image of the fourth premolar.

a. Open the mouth and place a suitably sized film diagonally against the hard palate with the cusp tip of the fourth premolar to be imaged touching the edge of the film and the majority of the film in the oral cavity, ensuring that the film is caudal enough to be able to image the second molar tooth.

b. Looking into the oral cavity from rostrally, visualise the angle between the long axis of the fourth premolar tooth (which is typically similar to the angle of the canine tooth) and the plane of the film.

c. Bisect that angle with an imaginary line.

d. Bring the cone of the x-ray machine as close as possible to the maxilla, directing the central x-ray beam perpendicular to the sagittal plane of the head.

e. Keeping the central beam in the transverse plane, rotate the x-ray head until the central x-ray beam is perpendicular to the imaginary bisecting line. *If the end of the cone of the x-ray machine is perpendicular to the central x-ray beam, the end of the cone will be parallel to and close to the bisecting line.*

f. The teeth to be imaged need to fall within the circumference of the cone, with >=3mm of surrounding tissue also included to permit detection of adjacent pathology.

g. Note the positioning and beam angulation as these can be used as a guide when imaging the opposite side.

4. **Root separation view for the maxillary fourth premolar (and molars).**
   Separating the superimposed images of the root apices of the mesiobuccal and palatal roots of the maxillary fourth premolar tooth requires an additional view.

   a. Open the mouth and place a suitably sized film diagonally against the hard palate with the cusp tip of the fourth premolar to be imaged touching the edge of the film and the majority of the film in the oral cavity, ensuring that the film is caudal enough to be able to image the second molar tooth.

   b. Looking into the oral cavity from rostrally, visualise the angle between the long axis of the fourth premolar tooth (which is typically similar to the angle of the canine tooth) and the plane of the film.

   c. Bisect that angle with an imaginary line.

   d. Bring the cone of the x-ray machine as close as possible to the maxilla, directing the central x-ray beam perpendicular to the sagittal plane of the head.

   e. Rotate the x-ray head in the transverse plane to bring the central x-ray beam perpendicular to the imaginary bisecting line. *If the end of the cone of the x-ray machine is perpendicular to the central x-ray beam, the end of the cone will be parallel to and close to the bisecting line.*

   f. Now rotate the head of the x-ray machine in the horizontal plane to direct the central beam at an angle caudally between the tooth roots. This is an oblique view.

   g. The tooth roots to be imaged need to fall within the circumference of the cone, with >=3mm of surrounding tissue also included to permit detection of adjacent pathology.

   h. Obtain a test exposure and if unsatisfactory, adjust the beam angulation to compensate for image elongation or lack of root separation and try again.

   i. *If caudal angulation does not provide adequate root separation then the beam can be angled rostrally. This is generally not as convenient due to the shape of the head, and requires an increased x-ray exposure to penetrate the increased amount of superimposed tissue.*

   j. Note the positioning and beam angulation as these can be used as a guide when imaging the opposite side.

5. **Extra-oral lateral near-parallel view for the maxillary fourth premolar, molar one and two (Only needed if adequate root separation cannot be achieved using the previous view).**
   In some animals, intra-oral film positioning is unsatisfactory for imaging the maxillary fourth premolar and molar tooth roots. If this is the case, try a lateral view with extra-oral film placement. For this view the animal is placed in lateral recumbency.

   a. Place the dog in lateral recumbency with the side to be imaged down.

   b. Place a mouth prop between the canine teeth to hold the mouth open.

   c. With the nose horizontally aligned, rotate the head slightly so that the buccal tooth roots are parallel to the film using a positioning aide to keep the head aligned.

   d. Place a suitably sized film on the table beneath the head adjacent to the maxillary molar teeth.

   e. Bring the cone of the x-ray machine as close as possible to the opposite side of the head, directing the central x-ray beam perpendicular to the film on the table.

   f. Rotate the x-ray head to direct the central x-ray beam sufficiently dorso-caudally to avoid superimposition of the contra-lateral dental arcade on the teeth to be imaged. *This can be*

checked by shining a light into the oral cavity from 20cm away and visualising the position of shadows.

  g. The teeth to be imaged need to fall within the circumference of the cone, with >=3mm of surrounding tissue also included to permit detection of adjacent pathology.

  h. If images of the apices of the fourth premolar are not sufficiently separated, angle the central beam more caudally.

  i. Note the positioning and beam angulation as these can be used as a guide when imaging the opposite side.

Mandibular Dentition

Position the dog in dorsal recumbency, with a sandbag under the neck if necessary to tilt the head so that the plate is parallel to the table. In practise, it is not essential to maintain the palate in the horizontal plane; however, it is advisable to help avoid any rotation of the head to left or right

6. **Rostro-caudal bisecting angle view of the mandibular incisors and canine teeth.**
   This view provides reasonably anatomically accurate representations of the mandibular canine and incisor tooth roots as the angles of the roots are normally similar. The tooth crowns will be foreshortened to a variable degree. The canine tooth roots are usually clearly visualised without significant superimposition of other structures and will be assessed when radiograph sets are reviewed. If the canine roots are not clearly shown, additional oblique views should be obtained.

   a. Open the mouth holding the tongue loosely against the mandibular incisor teeth and place a suitably sized film between the crowns of the canine teeth. *It is equally acceptable to fold the tongue caudally out of the way, but film placement is not as easy if this is done.*

   b. Both canine crown tips should be touching the film, near the edge, with the majority of the film extending symmetrically into the oral cavity.

   c. If one canine tooth is shorter than the other, use a radiolucent positioning aid to pack up the shorter crown until it approximates the height of the longer crown.

   d. Looking from lateral (either left or right as convenient), visualise the angle between the average of the long axes of the canine and incisor tooth roots and the film. *Note that the priority is accurate imaging of the tooth roots and their surrounding tissues.*

   e. That angle is bisected by an imaginary line.

   f. The central beam should remain aligned with the mid sagital plane of the dog.

   g. Bring the cone as close as possible to the mandible, directing the central x-ray beam perpendicular to the imaginary bisecting line keeping the central x-ray beam directed along the mid sagital plane. *If the end of the cone of the x-ray machine is perpendicular to the central x-ray beam, the end of the cone will be parallel to and close to the bisecting line.*

   h. The teeth to be imaged need to fall within and be centred within the circumference of the cone, with >=3mm of surrounding tissue also included to permit detection of adjacent pathology.

7. **Lateral bisecting angle view of the mandibular canine teeth and rostral premolars.**
   Note that this is a true orthogonal projection of the canine tooth. This view will also image some of the premolar teeth. The x-ray beam is in the transverse plane of the head; this is not an oblique view. However, the canine tooth apices must be clearly visible with >=3 mm around the apex and no significant superimpositions with other structures (mandibular symphysis, mental foramen etc.), so, where this is not achieved with a straight lateral view, a lateral oblique view should be used. If the premolars are not correctly represented on the canine view then an additional film should be included in the set to show them.

a. Open the mouth holding the tongue loosely against the mandibular incisor teeth and place a suitably sized film between the crowns of the canine teeth. It is equally acceptable to fold the tongue caudally out of the way, but film placement is not as easy if this is done.

b. Both mandibular canine crown tips should be touching the film, with that of the tooth that is being imaged near the corner of the film and with the majority of the film extending caudally into the oral cavity.

c. If one canine tooth is shorter than the other, use a radiolucent positioning aid to pack up the shorter crown until it approximates the height of the longer crown.

d. Looking into the oral cavity from rostrally, visualise the angle between the long axis of the mandibular canine tooth and the plane of the film.

e. Bisect that angle with an imaginary line.

f. Bring the cone of the x-ray machine as close as possible to the mandible, directing the central x-ray beam horizontally, perpendicular to the sagital plane of the head.

g. Keeping the central beam in the transverse plane, rotate the x-ray head until the central x-ray beam is perpendicular to the imaginary bisecting line. *If the end of the cone of the x-ray machine is perpendicular to the central x-ray beam, the end of the cone will be parallel to and close to the bisecting line.*

h. The canine tooth needs to fall entirely within and the root be centred within the circumference of the cone, with >=3mm of surrounding tissue also included to permit detection of adjacent pathology.

i. Note the positioning and beam angulation as these can be used as a guide when imaging the opposite side.

8. **Lateral parallel view of the mandibular fourth premolar and the molars.**
If a large dog is used it may not be possible to obtain images of all these teeth in one view. In this situation it is preferable to have the fourth premolar and first molar on one view and to have all three molars imaged on a second view.

a. Open the mouth and place a suitably sized film between the mandibular body and tongue so that it is parallel to the long axes of the teeth and maintain it in place with a positioning aid.

b. Ensure that the film extends ventrally to beyond the border of the mandible. The edge of the film should be palpable externally beyond the ventral margin on the mandible.

c. Bring the cone as close as possible to the mandible

d. Direct the central x-ray beam perpendicular to the film. *If the end of the cone of the x-ray machine is perpendicular to the central x-ray beam, the end of the cone will be parallel to the film and close to or touching the skin.*

e. The teeth to be imaged need to fall within the circumference of the cone, with >=3mm of surrounding tissue also included to permit detection of adjacent pathology. Ideally the full height of the mandible should be imaged.

Standard Dental Views for the Cat

Maxillary dentition

Position the cat in sternal recumbency, with a sandbag under the chin supporting the head with the hard palate in a horizontal plane. In practise, it is not essential to maintain the palate in the horizontal plane; however, this helps to avoid any rotation of the head to left or right

1) **Rostro-caudal approximate bisecting angle view of the maxillary incisor teeth, including the canine teeth and full width of the rostral maxilla.**
   This view provides a slightly magnified anatomically accurate representation of the incisor teeth. The canine teeth will not be ideally represented due to superimposition of other teeth over the images of their roots. It is difficult to obtain satisfactory images using size two films so it is recommended to use size 4. *Clinically it is necessary to obtain slightly oblique rostro-caudal views to assess the canine teeth accurately but those views are not required in a radiograph set submitted to fulfil credentials requirements.*

   a. Open the mouth and place a suitably sized film between the crowns of the canine teeth.

   b. Both maxillary canine crown tips should be touching the film with as much of the film as possible extending into the oral cavity. The film may be positioned symmetrically or at a 45 degree angle with a corner deep in the oral cavity.

   c. If one canine tooth is shorter than the other, use a radiolucent positioning aid to pack up the shorter crown until it approximates the height of the longer crown.

   d. Looking from lateral (either left or right as convenient), visualise the angle between the long axis of the canine tooth root and the plane of the film.

   e. Bisect that angle with an imaginary line.

   f. Bring the cone of the x-ray machine as close as possible to the maxilla dorsally, with the central beam aligned with the mid sagital plane of the cat.

   g. Keeping the central beam aimed along the mid sagital plane, rotate the head of the x-ray machine until the central x-ray beam is directed perpendicular to the imaginary line bisecting the tooth/film angle. *If the end of the cone of the x-ray machine is perpendicular to the central x-ray beam, the end of the cone will be parallel to and close to the bisecting line.*

   h. The teeth to be imaged need to fall and be centred within the circumference of the cone, with >=3mm of surrounding tissue also included to permit detection of adjacent pathology.

2) **Lateral bisecting angle views of the maxillary canine teeth and premolars.**
   This is a true orthogonal lateral projection of the canine tooth. The x-ray beam is in the transverse plane of the head; this is not an oblique view. However, the canine and premolar apices must be clearly visible with >=3 mm of surrounding tissue with no significant superimpositions with other structures. Where this is not achieved with a lateral view, a lateral oblique view of the canine tooth should be obtained. *The fourth premolar and molar tooth will not be satisfactorily imaged in this view due to superimposition of the zygomatic arch.*

   a. Open the mouth and place a suitably sized film between the crowns of the canine teeth rostrally and the crowns of the premolar teeth caudally, so that the film is nearly parallel to the hard palate.

   b. Both maxillary canine crown tips should be touching the film, with that of the tooth that is being imaged near the corner of the film and with the majority of the film extending caudally into the oral cavity.

c. If one canine tooth is shorter than the other, use a radiolucent positioning aid to pack up the shorter crown until it approximates the height of the longer crown.

d. Looking rostro-caudally into the oral cavity, visualise the angle between the long axis of the maxillary canine tooth and the plane of the film.

e. Bisect that angle with an imaginary line.

f. Bring the cone of the x-ray machine as close as possible to the maxilla, directing the central x-ray beam horizontally, perpendicular to the sagital plane of the head.

g. Keeping the central beam in the transverse plane, rotate the x-ray head until the central x-ray beam is perpendicular to the imaginary bisecting line. *If the end of the cone of the x-ray machine is perpendicular to the central x-ray beam, the end of the cone will be parallel to and close to the bisecting line.*

h. The canine tooth needs to fall within the circumference of the cone, with >=3mm of surrounding tissue also included to permit detection of adjacent pathology.

i. Note the positioning and beam angulation a as these can be used as a guide when imaging the opposite side.

3) Extra-oral near-parallel view of the maxillary premolars and molar tooth.
The extra-oral view normally provides more accurate premolar tooth images with less superimposition of other structures.

a. Position the cat in lateral recumbency, with the side to be imaged down.

b. Place a mouth prop between the canine teeth.

c. Place a suitably sized film on the table beneath the head.

d. Rotate the head slightly so that the premolar tooth roots are parallel to the film.

e. Bring the cone of the x-ray machine as close as possible to the cat, directing the central x-ray beam perpendicular to the film on the table.

f. Rotate the x-ray head to direct the central x-ray beam slightly dorso-caudally, just sufficiently to avoid superimposition of the contra-lateral dental arcade on the teeth to be imaged. *This can be checked by shining a light into the oral cavity from 20 cm away and visualising the position of shadows.*

g. The tooth roots to be imaged need to fall within the circumference of the cone, with >=3mm of surrounding tissue also included to permit detection of adjacent pathology.

h. If images of the apices of the fourth premolar are not sufficiently separated, angle the central beam more caudally.

i. Note the positioning and beam angulation and use these as a guide when imaging the opposite side.

Mandibular dentition

Position the cat in dorsal recumbency so that the hard palate is maintained in a horizontal plane. In practise, it is not essential to maintain the palate in the horizontal plane; however, this helps to avoid any rotation of the head to the left or right.

1) Rostro-caudal bisecting angle view of the mandibular incisors and canine teeth.
This view provides reasonably anatomically accurate representations of the mandibular canine and incisor tooth roots as the angles of the roots are normally similar. The tooth crowns will be foreshortened to a variable degree.

a. Open the mouth holding the tongue loosely against the mandibular incisor teeth and place a suitably sized film between the crowns of the canine teeth. It is equally acceptable to fold the tongue caudally out of the way, but film placement is not as easy if this is done.

b. Both mandibular canine crown tips should be touching the film with the majority of the film extending symmetrically into the oral cavity.

c. If one canine tooth is shorter than the other, use a radiolucent positioning aid to pack up the shorter crown until it approximates the height of the longer crown.

d. Looking from lateral (either left or right as convenient), visualise the angle between the average of the long axes of the canine and incisor tooth roots and the film.

e. That angle is bisected by an imaginary line.

f. Bring the cone as close as possible to the mandible, directing the central x-ray beam perpendicular to the imaginary bisecting line whilst keeping the central x-ray beam directed along the mid sagital plane. *If the end of the cone of the x-ray machine is perpendicular to the central x-ray beam, the end of the cone will be parallel to and close to the bisecting line.*

g. The central beam should remain aligned with the mid sagital plane of the cat.

h. The teeth to be imaged need to fall and be centred within the circumference of the cone, with >=3mm of surrounding tissue also included to permit detection of adjacent pathology.

2) **Lateral bisecting angle view of the mandibular canine and rostral premolar teeth.**
Note that this is a true orthogonal projection of the canine tooth. This will also image some of the premolar teeth. The x-ray beam is in the transverse plane of the head; this is not an oblique view. However, the canine tooth apices must be clearly visible with >=3 mm around the apex and no significant superimpositions with other structures (mandibular symphysis, mental foramen etc.), so, where this is not achieved with a lateral view, a lateral oblique view should be used.

a. Open the mouth holding the tongue loosely against the mandibular incisor teeth and place a suitably sized film between the crowns of the canine teeth. It is equally acceptable to fold the tongue caudally out of the way, but film placement is not as easy if this is done.

b. Both mandibular canine crown tips should be touching the film, with that of the tooth that is being imaged near the corner of the film and with the majority of the film extending caudally into the oral cavity.

c. If one canine tooth is shorter than the other, use a radiolucent positioning aid to pack up the shorter crown until it approximates the height of the longer crown.

d. Looking rostro-caudally into the oral cavity, visualise the angle between the long axis of the mandibular canine tooth and the plane of the film.

e. Bisect that angle with an imaginary line.

f. Bring the cone of the x-ray machine as close as possible to the mandible, directing the central x-ray beam horizontally, perpendicular to the sagital plane of the head.

g. Keeping the central beam in the transverse plane, rotate the x-ray head until the central x-ray beam is perpendicular to the imaginary bisecting line. *If the end of the cone of the x-ray machine is perpendicular to the central x-ray beam, the end of the cone will be parallel to and close to the bisecting line.*

h. The canine tooth needs to fall and the root be centred within the circumference of the cone, with >=3mm of surrounding tissue also included to permit detection of adjacent pathology. Ideally the full height of the mandible should be imaged.

    i.   Note the positioning and beam angulation and use these as a guide when imaging the opposite side.

3) Lateral parallel view of the mandibular premolars and molar

    a.   Open the mouth and place a suitably sized film between the mandibular body and tongue so that it is parallel to the long axes of the teeth.

    b.   Ensure that the film extends ventrally beyond the border of the mandible. The edge of the film should be palpable externally beyond the ventral margin on the mandible.

    c.   Bring the cone as close as possible to the mandible

    d.   Direct the central x-ray beam perpendicular to the film. *If the end of the cone of the x-ray machine is perpendicular to the central x-ray beam, the end of the cone will be parallel to the film and close to or touching the skin.*

    e.   The teeth to be imaged need to fall within the circumference of the cone, with >=3mm of surrounding tissue also included to permit detection of adjacent pathology. Ideally the full height of the mandible should be imaged.

Standard Temporomandibular Radiograph Sets

The techniques described below can be applied to both the cat and dog.

Note that radiopaque markers must be included within the primary beam when obtaining the radiographs indicating left and/or right sides.

A set of TMJ radiographs consists of:

1) A dorsoventral or ventro-dorsal view:

    a. The animal is placed in dorsal or ventral recumbency.

    b. The mouth is closed with the palate parallel to the radiographic film.

    c. The x-ray beam is centred on the midline with the central transverse collimator line passing slightly rostral to both horizontal ear canals. This approximates centring between the joints.

2) Left and right lateral-oblique views providing near mirror images of the joints.

    a. The animal is placed in lateral recumbency.

    b. The mouth may be open or closed.

    c. The joint to be examined should be on the lower side, closest to the radiographic film.

    d. The head is angled slightly by axial rotation (to lift the mandible) and/or by lifting the nose (see below).

    e. The x-ray beam is centred on the joint space that is to be imaged.

Lateral-oblique positioning methods

1) Nose-up rotation view:

    a. Initially position the sagittal plane of the head parallel to the radiographic film

    b. Elevate the nose to between 5° and 20° (lower end for mesaticephalic dogs).

    c. The joint to be examined should now:

        i) Appear rostral to the opposite joint.

        ii) Be free from superimposition by other significant skeletal structures or the endotracheal tube.

    d. Position the left and right radiographic markers:

        i) For the imaged joint, place the marker on the film close to but not where it will be superimposed on the image of the mandibular body.

        ii) Position the marker for the opposite side on the cranium caudo-dorsal to the area of interest.

2) Axial rotation view:

    a. Initially position the head so that the sagittal plane is parallel to the radiographic film.

    b. Looking rostro-caudally, rotate the head between 10° and 20° on its long axis (lower end for mesaticephalic dog).

        i) Clockwise for the left TMJ

        ii) Anti-clockwise for the right TMJ.

    c. The joint to be examined should now:

       i) Appear ventral to the opposite joint.

       ii) Be free from superimposition with other significant skeletal structures or the endotracheal tube.

    d. Position the left and right radiographic markers:

       i) For the imaged joint, place the marker on the film close to but not where it will be superimposed on the image of the mandibular body.

       ii) Position the marker for the opposite side on the cranium caudo-dorsal to the area of interest.

3) Combination of nose-up and axial rotation view:

    a. Initially the sagittal plane of the head is positioned parallel to the radiographic film.

    b. The head is rotated as described for axial rotation.

    c. The nose is elevated as described for nose-up rotation.

    d. The joint to be examined should now:

       i) Appear rostro-ventral to the opposite joint.

       ii) Be free from superimposition with other significant skeletal structures or the endotracheal tube.

    e. Position the left and right radiographic markers:

       i) For the imaged joint, place the marker on the film close to but not where it will be superimposed on the image of the mandibular body.

       ii) Position the marker for the opposite side on the cranium caudo-dorsal to the area of interest.