

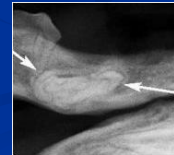
## Dental Radiography

PVSEC Lecture/Lab  
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## Dental Radiology

- Excellent detail
- Convenient
- Affordable
- **\*\*Essential to completely investigate tooth structures and oral pathology\*\***



## Dental Film

- Sizes: 0,1,2,3,4
- 4 "occlusal" film
- 2 "bite wing" film
- D and E speed
  - D = Ultraspeed
    - Less grainy
    - Greater detail
  - E = Ektaspeed
    - Fast, 1/2 exposure time



## Dental Film

- Marked with dot
- Labeled for positioning
- Moisture resistant packet
- Lead foil at bottom
- Film between black paper
- Silver halide crystals are sensitized by x-ray photons



## Film Processing

- Chair side Darkroom
- Lid allows visualization without affecting film development
- Hand portals
- Four containers inside
  - Developer (15-30 sec)
  - Water
  - Fixer (1min/10-30min)
  - Water



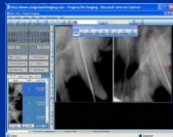
## Developer & Fixer

- Developer
  - Sensitive silver halide crystals change to black metallic silver
  - Grey and Black parts of image
- Fixer
  - Unsensitive silver halide crystals removed
  - Transparent or white parts of image
  - Hardens emulsion ("fixes" image)
  - Silver particles in solution = hazardous waste



## Digital Radiography

- Advantages
  - Image produced faster
  - Digital transfer
  - Enhancement of image
  - Less radiation per exposure
  - No chemicals or lead foil
- Disadvantages
  - Less detail than film
  - Total upfront system cost
- Digital Systems
  - Phosphor Storage Plates
  - Intraoral Digital Sensors



## Phosphor Storage Plates

- Sizes 0-4
- Reusable thousands of times with care
- Stores latent image
- Plate stored in barrier envelope
- PSP placed in scanner
- Image viewed in 15-30 seconds



## Intraoral Digital Sensors

- Hard-wired
- Images in 5-7 sec
- Sizes 0-2
- Protective sleeves
- No #4 sensor



## Digital Sensor Shootout

VETDENTALRAD.COM VDR

- AFP, Bio-Ray, All Pro DR, All Pro CR (Scan X), Progeny, Ashtel
- Same x-ray, same positioning, same cadaver
- 4 distinct views
- Free CD to view images on your computer
- Also offer Telemedicine dental x-ray readings

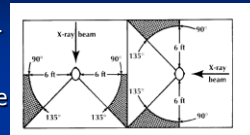
## Dental X-Ray Machine

- Fixed kVp (70-90)
- Fixed mA (10-15)
- Adjust TIME:
  - Seconds or Impulses
  - 1 impulse = 1/60 sec
  - 30 impulses = 0.5 sec
- Too light = underexposed
  - Need more time
- Too dark = overexposed
  - Need less time



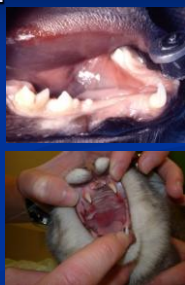
## Dental Radiation Safety

- 6 feet from beam or
- Behind Barrier
- 90-135 degree angle from central x-ray
- Not in path of beam
- Dosimetry Badge
- Lead Apron
- Portable Shield



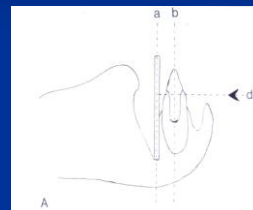
## Intraoral Radiographic Techniques

- Parallel Technique
- Bisecting Angle Technique

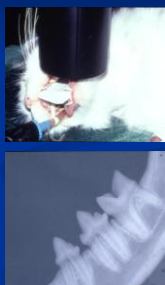
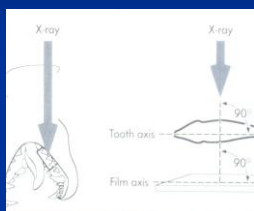


## Parallel Technique

- Plane of the dental film (a) is parallel to the long axis of the tooth (b) and perpendicular to the radiographic beam (d)
- Mandibular cheek teeth

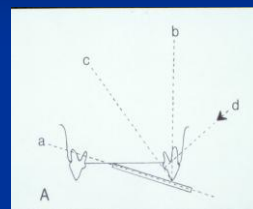


## Parallel Technique

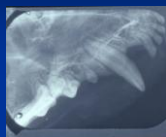


## Bisecting Angle Technique

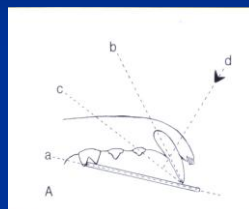
- Palatal vault and mouth floor prevent using parallel method on maxillary teeth, incisors, and canines
- Film placed as parallel as possible (a) to long axis of tooth (b). Angle between a and b is the bisecting line angle (c). X-ray beam (d) is directed perpendicular to the bisecting line angle.



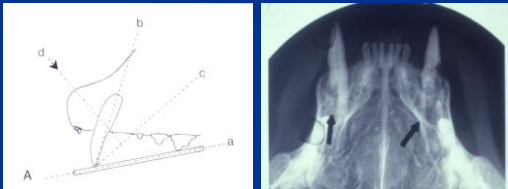
## Bisecting Angle Technique Maxillary cheek teeth



## Bisecting Angle Technique Rostral Mandible



### Bisecting Angle Technique Rostral Maxilla



Practical, In-Clinic Bottom Line  
for Bisecting Angle

# 45 Degrees

### Dental Film Positioners

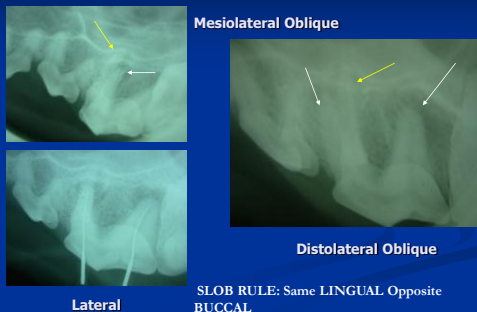
- Gauze
- Tape roll
- Mouth wedges



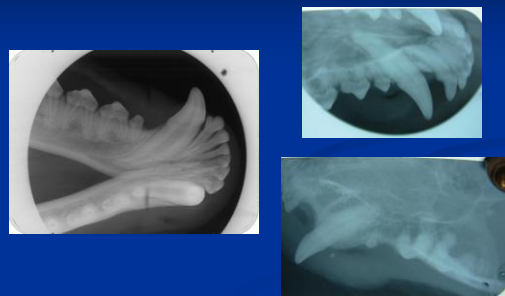
### Basic Intraoral Radiographic Survey

- 6 views
- Rostral Maxilla
- Rostral Mandible
- Right and Left Maxilla
- Right and Left Mandible
- Additional views to visualize all 3 roots of upper fourth premolar
- Lateral + Oblique views for canine teeth

### Projections for Maxillary Fourth Premolar



### Lateral Oblique Projection Canine Teeth



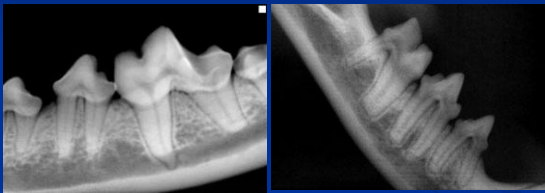
## Lateral Projection Canine Teeth



## Radiographic Interpretation

- Identify location and structures
- Recognize normal from abnormal
- Diagnose or classify the pathology
- Radiographic findings should correlate with history, clinical exam, and other diagnostics when making a diagnosis

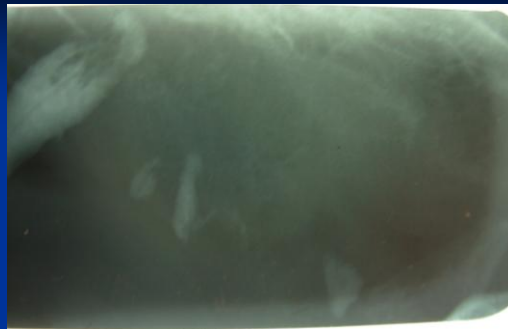
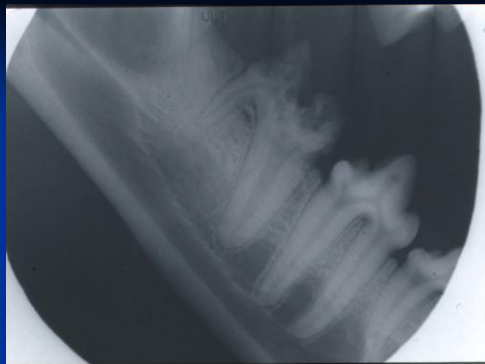
## Radiographic Anatomy



## Examples of Abnormal Radiographic Findings

- Periapical lucency
- Apical lysis
- Large endodontic systems
- Destruction of periodontal structures
- Tooth resorption
- Ankylosis
- Retained root tips
- Supernumerary teeth
- Malformed teeth
- Osteomyelitis
- Bone lysis secondary to neoplasia
- Traumatic injuries





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