

Indications for Panoramic Radiography

- Evaluation of trauma
- Third molars
- Large lesions
- Generalized disease
- Inability to tolerate intraoral films
- Assessment for surgical procedures

A small icon of a clipboard with a checklist and a pen, indicating a list of indications.

Advantages

- Well-tolerated by patients
- Minimal time to expose when compared to intraoral radiographs
- Broad anatomical coverage
- Relatively low patient dose
- Useful for patient education (although never exposed only for that purpose!)

A small icon of a patient's head and neck, representing the anatomical area covered by the radiograph.

Disadvantages

- Resolution is not as good as intraoral films. This results in decreased detail
- Only objects in focal trough are seen clearly
- Distortion of image
 - Overlapped teeth
 - Magnification
 - Minification
 - Objects of interest outside of focal trough

A small icon of a hand holding an X-ray film, representing the process of radiography.

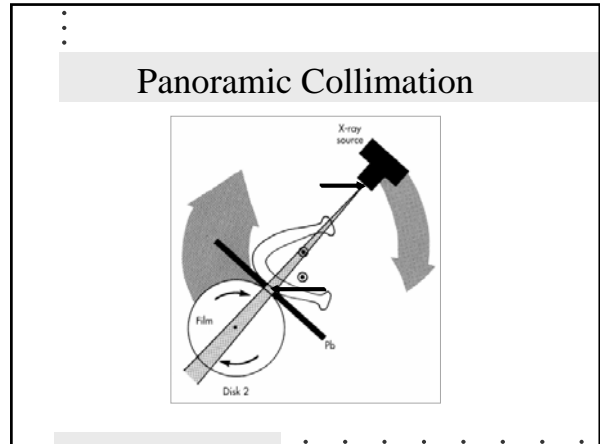
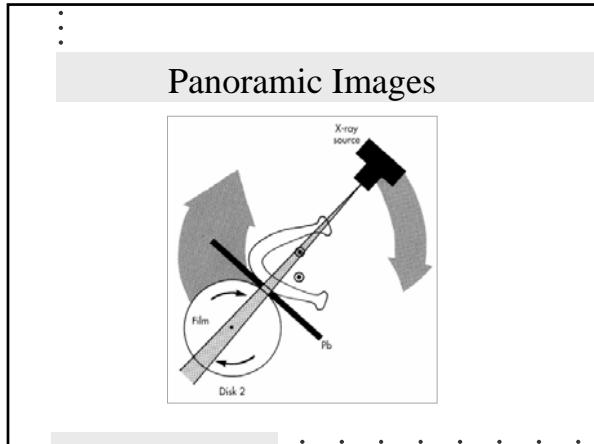
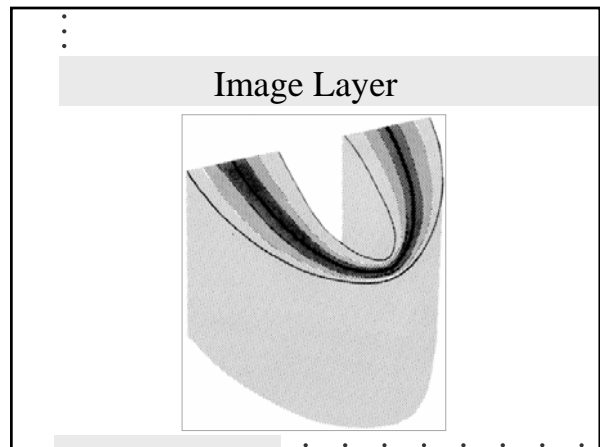


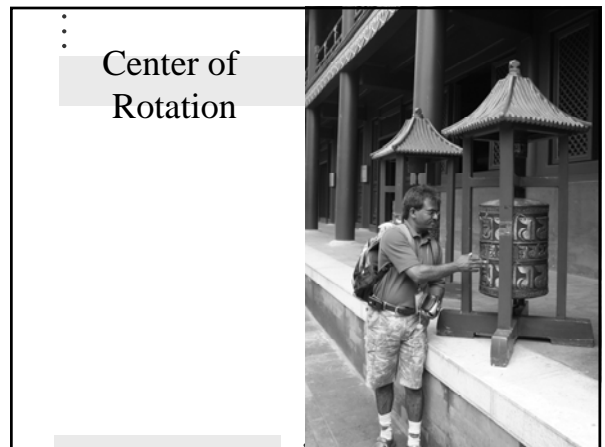
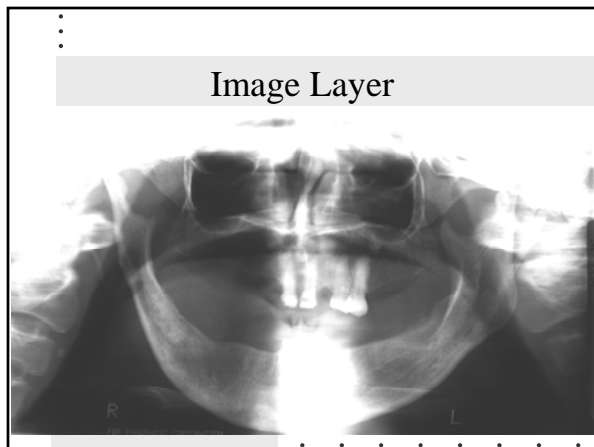
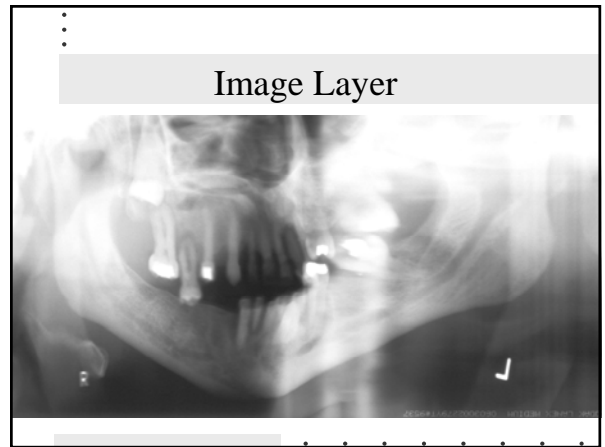
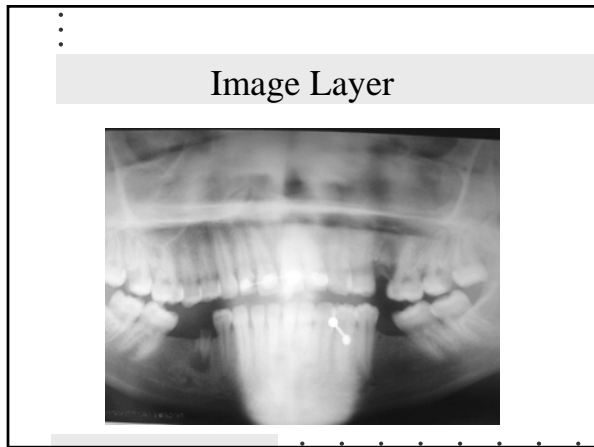
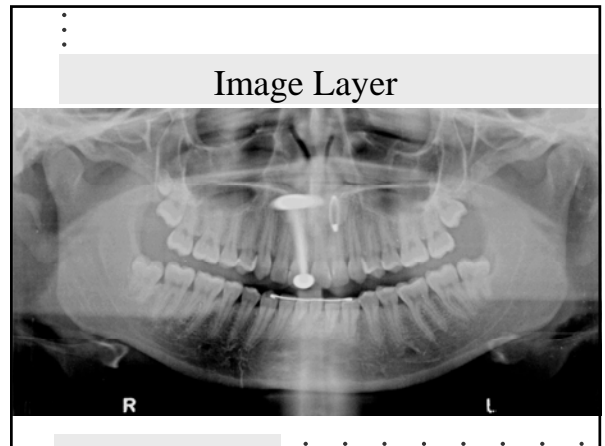
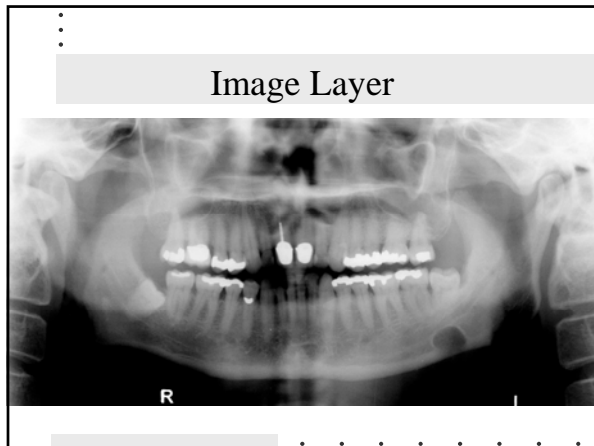
Image Layer

- Volume of tissue seen clearly on tomographic image
- Three dimensional curved volume
- Called the Focal Trough in panoramic radiology
- Can vary in thickness
- Usually pre-set on panoramic machines with variable settings for different size dental arches

Image Layer

- Patient must be positioned precisely in the machine, and machine set correctly so that the dental arches are in the focal trough
- Positioning may be difficult due to swelling, pain, and asymmetries





Center of Rotation

- Unfortunately, the dental arches are not true arcs. Therefore, several centers of rotation are necessary to maintain the dental arches in the focal trough as the machine turns around the patient.

Split image – 1 Stationary center of rotation

The Original SS White Panorex Machine

Continuous Image- 3 Fixed Centers of Rotation

Continuous Image - Sliding Beam Transition

Continuous Image – Combination of stationary + moving rotation centers

Positioning the Patient



Positioning the Patient

- Prepare the patient
 - Remove all removable appliances, metallic hairclips, necklaces, chains (including the patient bib!), earrings, etc. Tongue and lip rings should also be removed, if at all possible
 - Explain the procedure to the patient
- Prepare the machine
 - Disinfect the machine
 - Place a new bitestick in the machine



Positioning the Patient



Positioning the Patient

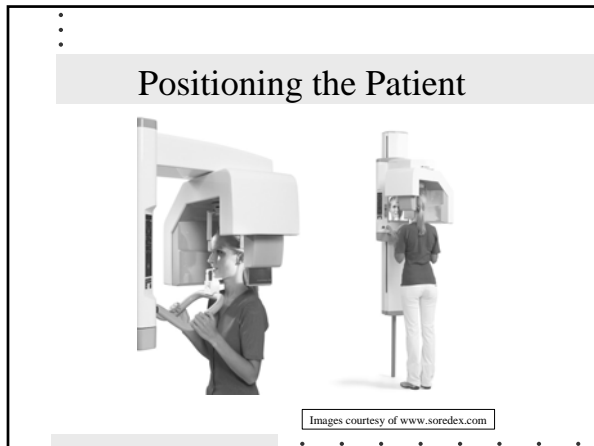
- Position the patient
 - Patient must be as straight as possible
 - The patient's neck should be extended
 - Anterior teeth should be in the notch on the bitestick
 - Tragus of the ear must be aligned with the plastic guides
 - Ala – Tragus line should be 5° from level




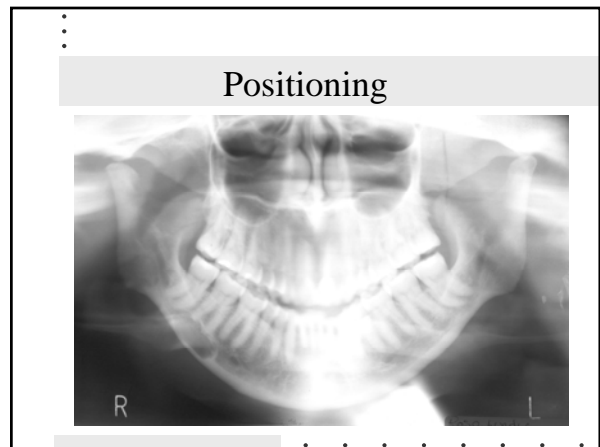
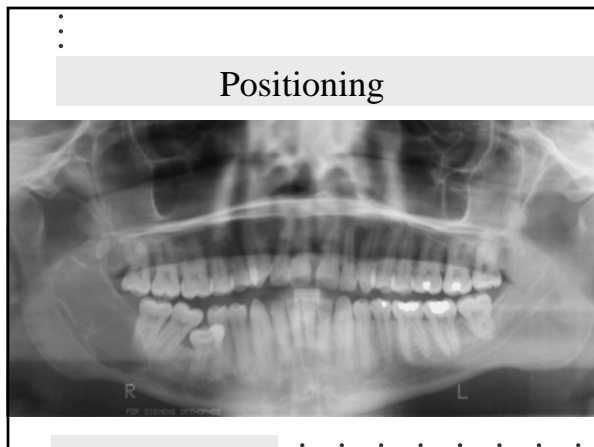
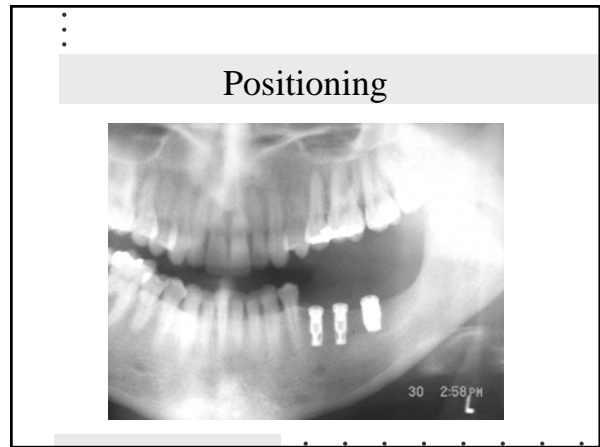
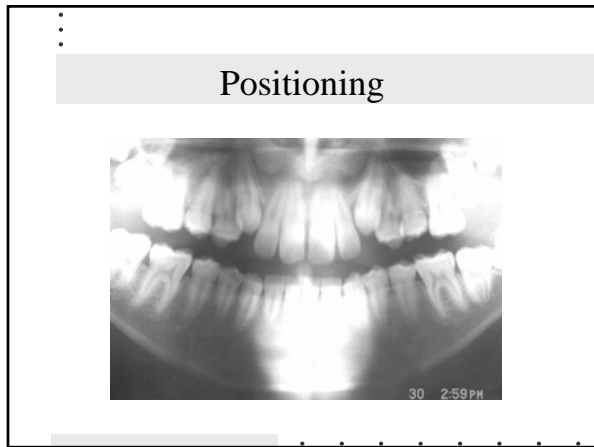
Positioning the Patient

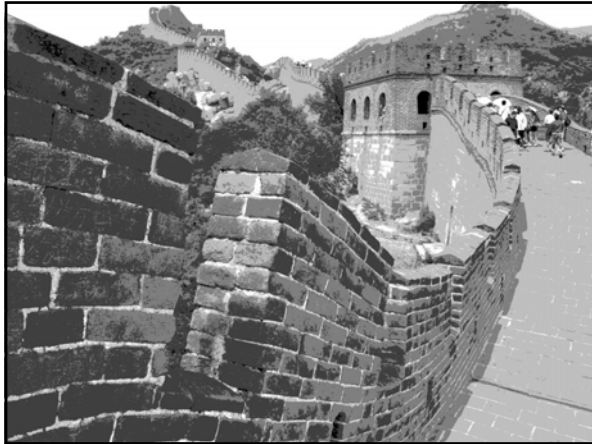
- Position the patient
 - Panoramic lead apron must be used
 - Position apron high in front to protect the thyroid
 - Apron should be lower in back to expose the neck





- ### Positioning the Patient
- Instruct the patient
 - Procedure takes less than ½ minute
 - Patient must remain motionless
 - The machine will revolve around the patient
 - Tongue must be kept against the hard palate
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Panoramic Concepts

- Anterior midline is in the center of the film
- Posterior midline is beyond the left and right edges of the image
- Structures appear flattened and spread out

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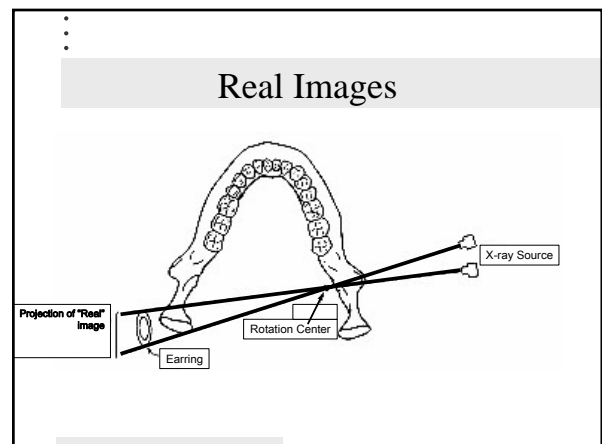
Panoramic Concepts

Images Seen on a Panoramic Radiograph

- Real Images
 - Single images
 - Double images
- Ghost Images

Panoramic Concepts

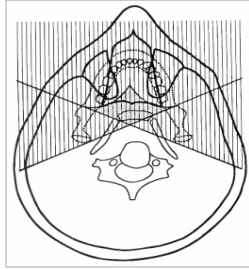
- Real images are formed when an object is radiographed between the center of rotation and the film
- Midline structures may appear as single or double images. Single and double images are real images



Double Images

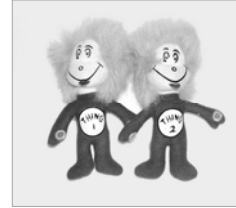


- Real images may be double images
- Double images are formed in zone in central region
- Common double images include
 - hard palate
 - soft palate
 - hyoid bone

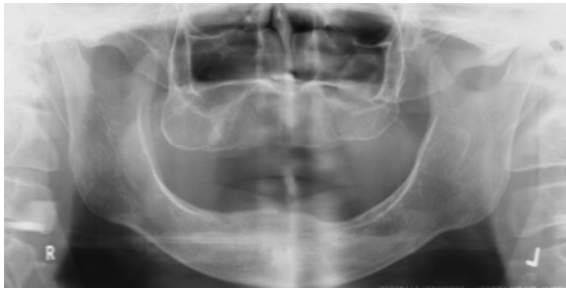


Double Images

- If patient is positioned too far forward, the spine may appear as a double image



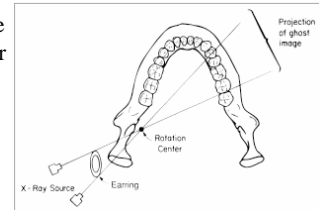
Real Images-- Single and Double



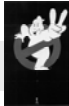
Ghost Images



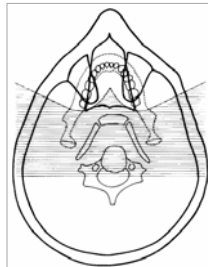
- Formed when an object is between the source and the center of rotation



Ghost Images



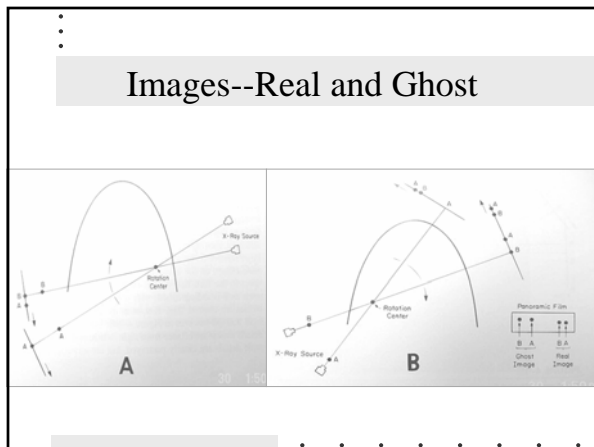
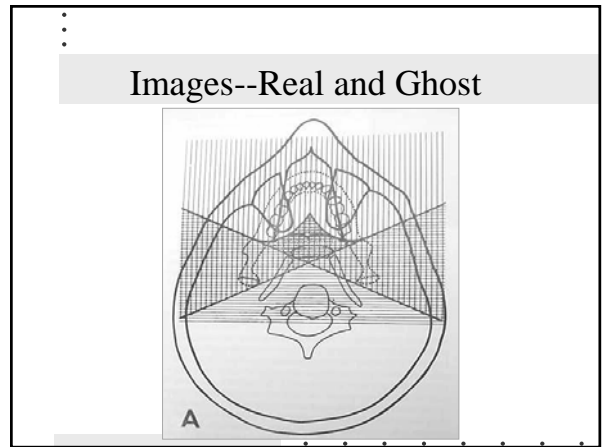
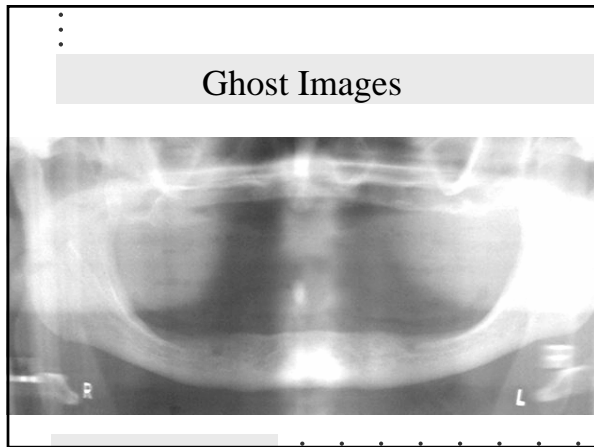
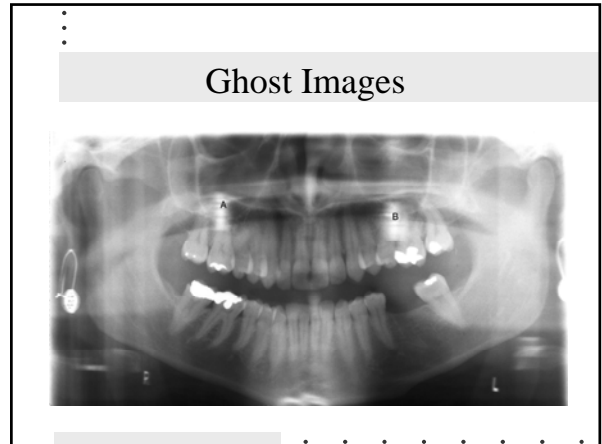
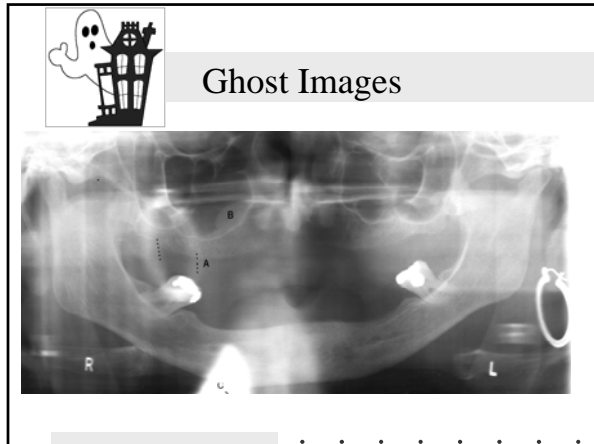
- Appear on opposite side of radiograph
- Appear superior to real images
- Appear more blurred than real images, but have the same morphology



Ghost Images

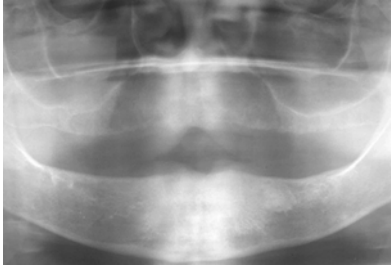
- Common ghost images:
 - L and R from machine
 - Spine
 - Earrings
 - Inferior border of the mandible



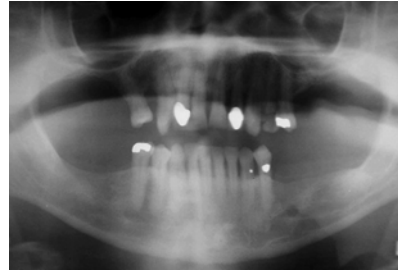


- Soft Tissue Outlines**
- Seen best in edentulous patients
 - Common soft tissue structures seen:
 - Dorsum of tongue
 - Soft Palate
 - Lips
 - Nasolabial fold

Soft Tissue Outlines



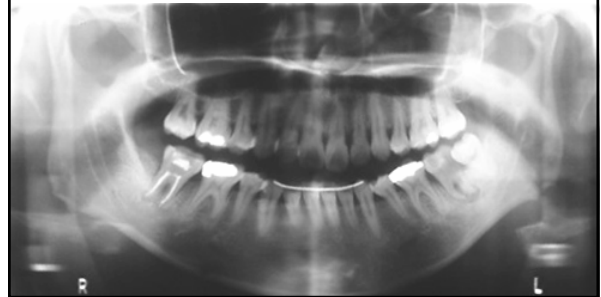
Tongue and Soft Palate



Air Spaces

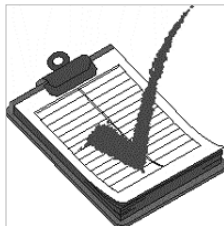
- Maxillary sinuses
- Glossopharyngeal air space
- Nasal Fossa

Air Spaces



Interpreting Panoramic Radiographs

- Examination is an orderly process:
 - Mandible
 - Maxilla
 - Zygoma
 - Soft tissue
 - Air spaces
 - Teeth

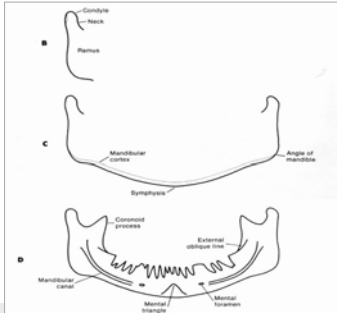


Interpreting Panoramic Radiographs



- Examine the borders of the bone first
- Next, examine the medullary bone
- Check the internal structures such as canals, foramina, and sinuses
- Check the soft tissue shadows
- Examine the air spaces
- Save the teeth for last!

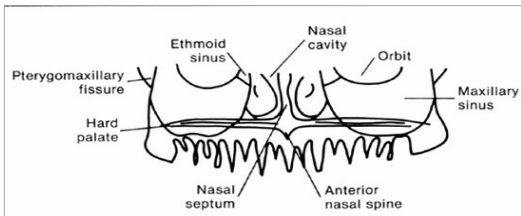
Interpreting Panoramic Radiographs



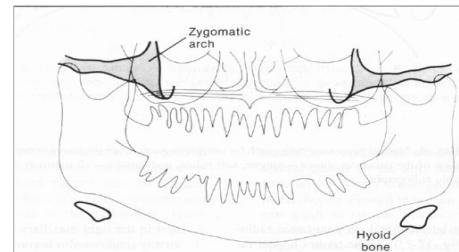
Interpreting Panoramic Radiographs



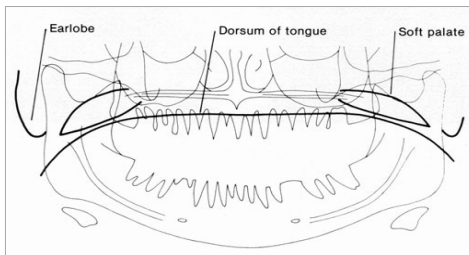
Interpreting Panoramic Radiographs



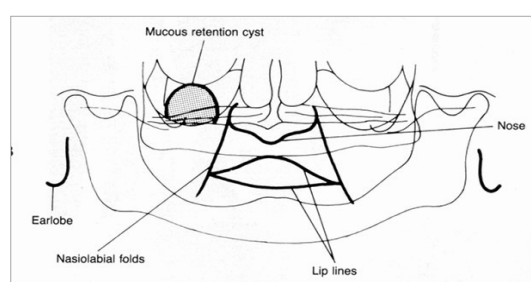
Interpreting Panoramic Radiographs



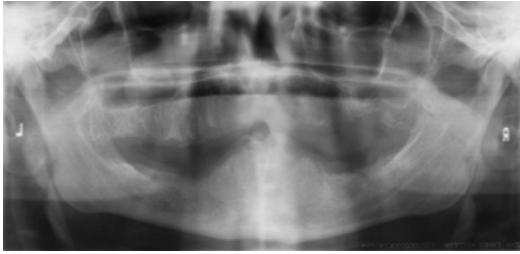
Interpreting Panoramic Radiographs



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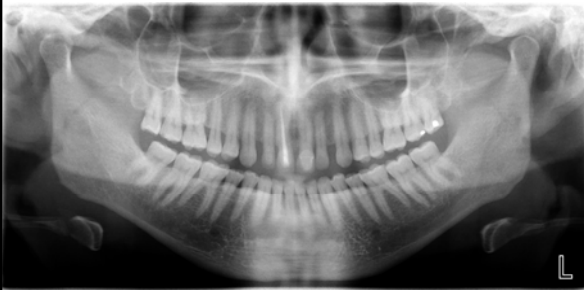
Interpreting Panoramic Radiographs



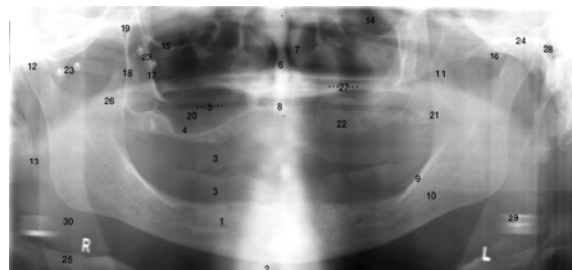
Panoramic Anatomy--Dentate



Interpretation



Panoramic Anatomy--Edentulous



Transitional Dentition

