2. The x-ray tubehead is positioned using the beam aiming device if available or the operator has to assess the *verticals* and *horizontal* angulations and then position the tubehead independently.

3. The exposure is made.
Using the patient’s finger

1. The appropriate sized film packet is positioned and orientated in the mouth, extending beyond the incisal or occlusal edge, to ensure that all the tooth will appear on the film./ the patient is then asked to gently support the film packet using either an index finger or thumb.
2 The operator then assesses the *vertical and horizontal angulations* and positions the tube head independently.

3 The exposure is made.
Positioning for Bisecting Angle radiography of incisors
Diagrammatic representation of positioning for bisecting angle technique for maxillary incisors.
Positioning for Maxillary canines

Maxillary canine
Diagrammatic representation of positioning for Maxillary Canines.
Positioning for Bisecting angle technique for molars
Diagrammatic representation of angulation for bisecting angle technique for maxillary molars
Positioning for mandibular Incisors

A

B
Diagrammatic representation of positioning for mandibular incisors
Positioning for mandibular canines
Diagrammatic representation of positioning for mandibular canines
Positioning for Mandibular premolars
Diagrammatic representation of positioning for mandibular premolars
Positioning for mandibular molars
Diagrammatic representation of mandibular molar positioning.
Comparison of Techniques

The advantages and disadvantages of the two techniques are now summarised.
Advantages of paralleling Technique

• Geometrically Accurate images are produced with little magnification
• The shadow of the zygomatic buttress appears above the apices of the molar teeth
• The periodontal bone levels are well represented
• The periapical tissues are accurately shown with minimal foreshortening or elongation
• The crowns of the teeth are well shown, enabling the detection of approximal caries
• The horizontal and vertical angulations of the X-ray tubehead are automatically determined by the positioning devices if placed correctly
• The X-ray beam is aimed accurately at the centre of the film- all areas of the film are irradiated and there is no *coning off* or *cone cutting*

• Reproducible radiographs are possible at different visits and with different operators

• The relative positions of the film packet, teeth and x-ray beam are always maintained, irrespective of the position of the patients head. This is useful for some patients with disabilities
Disadvantages of Paralleling Technique

• Positioning of the film packet can be very uncomfortable for the patient, particularly for posterior teeth, often causing gagging.

• Positioning the holder within the mouth can be difficult for inexperienced operators.
• The anatomy of the mouth sometimes makes the technique impossible, e.g., a shallow, flat palate.

• The apices of the teeth can sometimes appear very near the edge of the film.

• Positioning the holders in the lower third molar regions can be very difficult.
• The technique cannot be performed satisfactorily using a short focal spot to skin distance (i.e., a short spacer cone) because of the resultant magnification.

• The holders need to be autoclavable or disposable.
Advantages of Bisecting Angle Technique

• Positioning of the film packet is reasonably comfortable for the patient in all areas of the mouth.
• Positioning is relatively simple and quick.
• If all angulations are assessed correctly the image of the tooth will be the same length as the tooth itself and should be *adequate* (but not ideal) for most diagnostic purposes.
Disadvantages of Bisecting Angle Technique

- The many variables involved in the technique often result in the image being badly distorted.
- Incorrect vertical angulation will result in foreshortening or elongation of the image.
- The periodontal bone levels are poorly shown.
• The shadow of the zygomatic buttress frequently overlies the roots of the upper molar teeth.

• The horizontal and vertical angles have to be assessed for every patient and considerable skill is required.

• It is not possible to obtain reproducible views
• *Coning off* or *cone cutting* may result if the central ray is not aimed at the centre of the film packet, particularly if using rectangular collimation.

• Incorrect horizontal angulation will result in overlapping of the crown and roots of the teeth.
• The crown of the teeth are often distorted, thus preventing the detection of approximal caries.

• The buccal roots of the maxillary premolars and molars are foreshortened.
Positioning Difficulties

- Placing the film packet intra-orally is not always possible. It is often necessary to modify the radiographic techniques described earlier.
The main difficulties encountered involve:-

- Mandibular third molars
- Gagging
- Endodontics
- Edentulous alveolar ridges
- Children
- Patients with disabilities.
Mandibular Third Molars

The main difficulty is placing the film packet sufficiently posteriorly to record the entire third Mandibular molar (particularly when it is horizontally impacted) and the surrounding tissues including the inferior dental canal.
Possible solutions

• Using specially designed or adapted holders
Problems of Gagging

The gag reflex is particularly strong in some patients this makes the placement of the film packet in the desired position particularly difficult, especially in the upper and lower molar regions
Possible Solutions

• Patient suck L.A. lozenge before attempting to position the film package

• Asking the patient to concentrate on deep breathing
• Placing the film packet flat in the mouth (occlusal plane) so it does not touch the palate and applying the principles of the bisected angle technique- the long axis of the tooth and film packet are assessed and the x-ray tubehead position modified accordingly.
Endodontics

• Film packet placement and stabilisation when endodontic instruments, rubber dam and rubber dam clamps are in position.
• Identification and separation of root canals
• Assessing root canal lengths from foreshortened or elongated radiographs
Possible solutions

• The problem of film packet placement and stabilisation can be resolved using a simple film packet holder such as the Rinn Eezee-grip.

This is positioned in the mouth and then held in place by the patient.
• Using one of the special endodontic film holders that have been developed.

• These incorporate a small basket in the bite platform area, to accommodate the handles of the endodontic instruments while still allowing the film packet and the tooth to be parallel
• Identifying and separating the root canals can be solved by taking at least 2 radiographs using different x-ray tubehead positions.

• Assessing root canal length can be solved by taking an accurate paralleling technique periapical preoperatively and measuring the lengths of the root(s) directly from the radiograph before beginning the endodontic treatment. The amount of distortion on subsequent films can then be assessed
Problems of the edentulous Ridge

- Lack of height in palate
- Lack of lingual sulcus
- Paralleling technique may be contraindicated
Possible Solutions

• Modified bisecting angle technique recommended
• Paralleling technique in partially dentate patients
• Use of cotton wool rolls may help in stabilising film holder.
Children

• Small mouth

• Lack of vertical dimension

• Paralleling technique may not be possible posteriorly
Finally

• Periapical radiography, and essential tool in the armoury of diagnosis is not always straightforward.

• A thorough knowledge of the principle of radiography and the ability to modify technique according to individual needs will be the best way forward.
Time to wake up