Bitewing Radiography

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Main Indications

• Detection of Dental Caries
• Monitoring progression of caries
• Assessment of existing restorations
• Assessment of Periodontal status
Ideal Technique Requirements

- The tab or bite platform should be positioned on the middle of the film packet
- And parallel to the upper and lower edges of the film
Position of Tab
The film packet should be positioned with its long axis horizontally for a horizontal bitewing or vertically for a vertical bitewing.
A  Adult horizontal bitewing
B  Child horizontal bitewing
C  Adult vertical bitewing
• The posterior teeth and the film packet should be in contact or as close together as possible whilst avoiding over bending of the film
Relative positions of film, tube head and teeth for different arch shapes

A. U-shaped arch
B. V-shaped arch
C. Square arch

2 different film and X-ray positions are required to maintain the ideal geometry.
Relative positions of film, holder and teeth
Seen from inside the mouth! (If only!)
In the horizontal plane, the X-ray tubehead should be aimed so that the beam meets the teeth and the film packet at right angles, and passes directly through all the contact areas.
• In the vertical plane, the X-ray tubehead should be aimed downwards (approximately 5-8 degrees to the horizontal) to compensate for the upwardly rising curve of Monson.
Angulation for curve of Monson
• The positioning should be reproducible!
Using a tab attached to the film packet

1. The appropriate size of film is selected and the tab attached as shown
Film Sizes

- Large film 31 x 41 mm for adults

- Small film packet 22 x 35 mm for children under 12. Once the second permanent molars have erupted the adult size film is required.

- Occasionally a longer film packet (53 x 26 mm) is used for adults
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- The patient is positioned with the head supported and with the occlusal plane horizontal.
The shape of the dental arch and the number of films required is assessed.
• The operator holds the tab between thumb and forefinger and inserts the film packet into the lingual sulcus opposite the posterior teeth
• The anterior edge of the film packet should be positioned opposite the distal aspect of the lower canine – in this position, the posterior edge of the film packet extends usually just beyond the mesial aspect of the lower third molar.
The tab is placed on to the occlusal surfaces of the lower teeth.
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- The patient is asked to close the teeth firmly together on to the tab.
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- As the patient closes the teeth together, the operator pulls the tab firmly between the teeth to ensure that the film packet and the teeth are in contact.
The operator releases the tab and positions the tube head.
When positioning the tubehead, after the patient closes the mouth the film can no longer be seen.

To ensure that the anterior part of the film is exposed and to avoid *coning off* or *cone cutting*, a simple guide to remember is that the front edge of the open-ended spacer cone should be positioned adjacent to the corner of the patient’s mouth.
The X-ray beam is aimed directly through the contact areas, at right angles to the teeth and the film packet, with an approximate 5 – 8 degree downward vertical angulation.
The exposure is made
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- The procedure is repeated for the premolar teeth if required, with a new film packet and X-ray tubehead position.
Advantages

- Simple to use
- Inexpensive
- Tabs are disposable, so no extra cross infection control procedures required.
- Can be easily used for children.
Disadvantages

• Arbitrary, operator-dependent assessment of the horizontal and vertical angulations of the X-ray tube head.

• Radiographs not accurately reproducible, so not suitable for monitoring the progression of caries.

• *Coning off* or *Cone cutting* of anterior part of film is common.

• The tongue can easily displace the film packet
Using simple film packet holders

- Many types are available
- They can eliminate many of the disadvantages of the tab method.
- Holders vary in cost and design
Three Basic components

- A mechanism for holding the film packet parallel to the teeth
- A bite platform that replaces the wing (tab)
- An X-ray beam aiming device.
Advantages

- Simple
- Film packet held firmly and not displaced by tongue
- Position of tubehead determined by holder
- Avoids coning off or cone cutting.
- Holders are autoclavable or disposable
Disadvantages

- Position of the holder is operator dependent
- Not 100% reproducible
- Positioning of film holder can be uncomfortable for the patient
- Some holders are relatively expensive
- Holders not suitable for children.
Conclusion

Traditional bitewing techniques, using detachable tabs, although simple to perform are operator dependent and inaccurate. Film holders are more accurate and are recommended.
Normal Appearance of Bitewing Radiographs

- Pulp chambers
- Metallic restorations
- Orientation dot
- Normal trabecular pattern
- Enamel
- Dentine
- Floor of the antrum
- Pulp stones
- Carious cavity
- Cervical translucency or burn-out
The clinical reasons for taking bitewing radiographs should determine the exposure factors.

- Assessment of caries – well exposed
- Assessment of periodontal status - underexposed
In Practice

- A typical pair of bitewings involves a compromise with regard to exposure factors. In this way the radiation dose to the patient is kept to a minimum.