VistaPosition PSP

Manual

DÜRR DENTAL

THE BEST, BY DESIGN

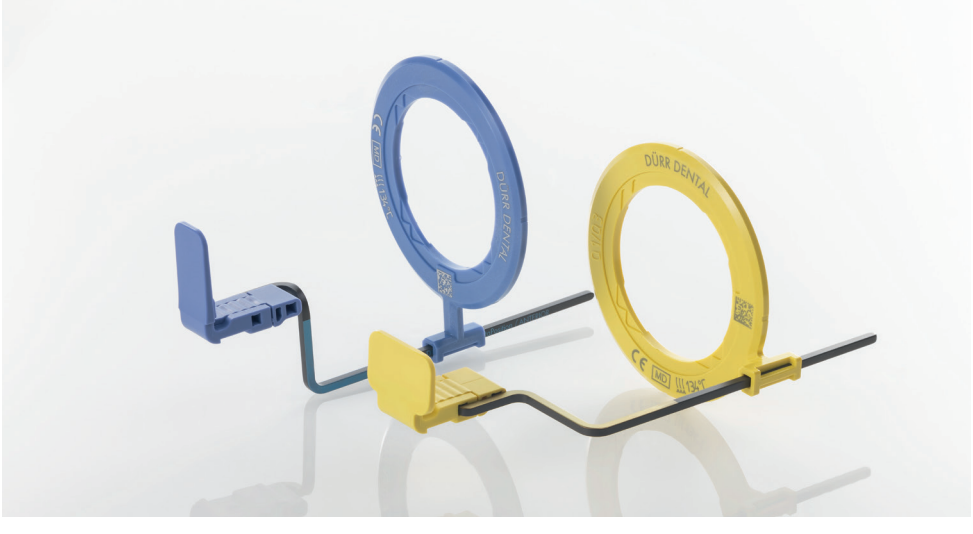
Contents

Making intraoral X-ray imaging easy

Every dental practice wants to produce high-quality radiographs. Different procedures and imaging techniques lead to different results. This manual describes the time-tested techniques in intraoral radiography and provides some tips and tricks that can be used to successfully take simple and reproducible radiographs.

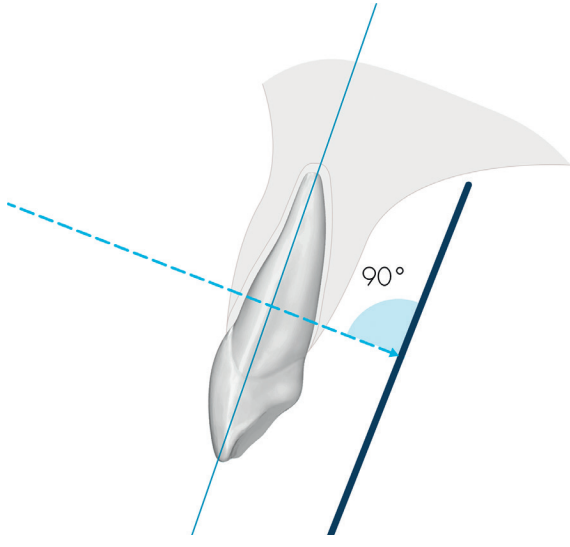
The aim of intraoral X-ray images

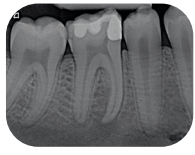
Intraoral images are used for detailed evaluation of tooth crown and root, periapical region and periodontal status. The aim is to obtain a complete and detailed image of the tooth in question and at least its two neighbouring teeth, including the crown, root tip and bone structure, in a high-resolution image. Overlapping, distortion, lengthening or shortening of the imaged structures must be minimised.



A number of imaging techniques

1. Parallel technique





Process:

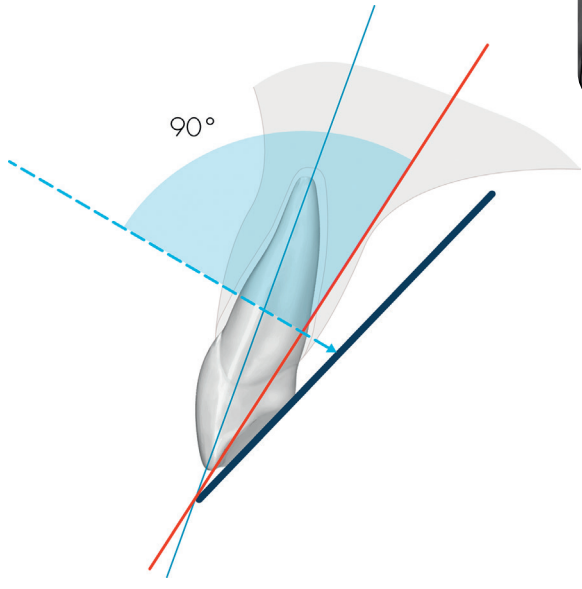
The image plane is to be aligned parallel to the tooth axis

- The central beam runs parallel to the indicator arm and hits the centre of the image receptor vertically.
- Use of a parallel technique holder system.

Advantages:

- Ensures that the entire active surface of the image plate is exposed.
- Easy to master.
- Since the image plate is not held with a finger, errors are minimised.
- The longevity of image plates is increased by using a well-designed holder system.
- Reproducibility of the imaged region for further radiographs, for example, to document the course of treatment.

2. Half-angle technique (isometric rule according to Cieszyński and Dieck)



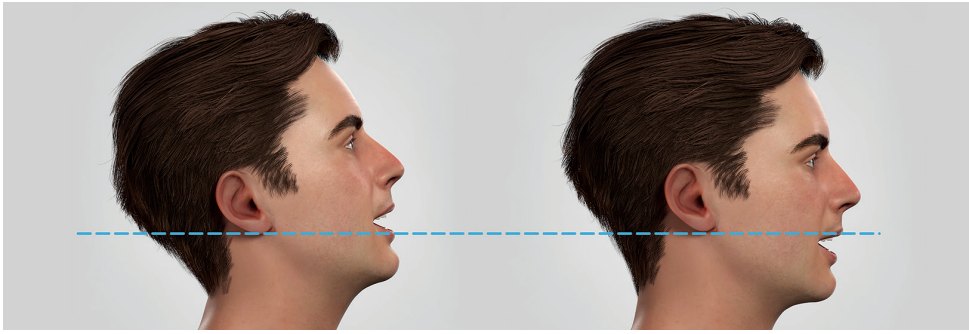
The central beam hits the imaginary plane of the 'bisector' of the angle between the tooth axis and the image plane at a 90° angle.

Process:

- Parallel alignment of the occlusal plane of the appropriate jaw with respect to the floor.
- Alignment of the head of the X-ray emitter according to the degree of the region to be imaged.
- Alignment of the tube towards the region to be imaged.

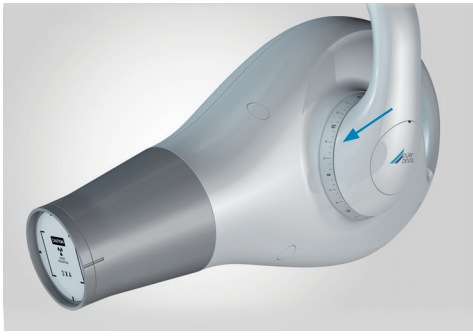
Features:

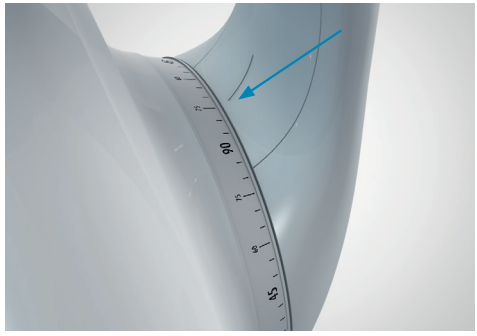
- No holder system required.
- Due to possible bending of the image plate, a distorted image is to be expected.
- Shortened visualisation of the vestibular root compared to the palatinal root in the posterior region of the maxilla.
- Learning curve (!)



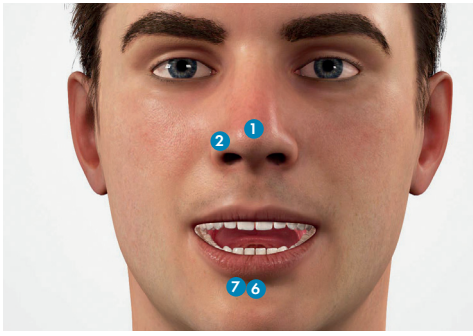
Alignment of the lower jaw parallel to the floor for images in the lower jaw

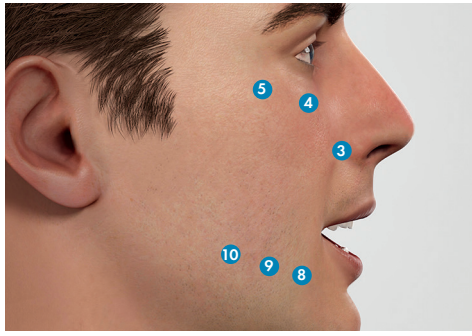
Alignment of the upper jaw parallel to the floor for images in the upper jaw





Adjustment of the X-ray emitter





Recommended alignment of the central beam according to the region to be imaged.

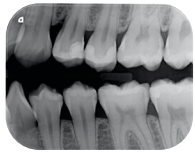
Upper jaw:

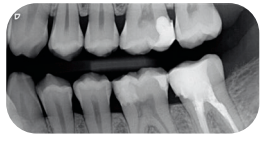
1. Centre anterior teeth: Nasal tip (+55°)
2. Lateral anterior tooth: Nasal wing (+55°)
3. Canine/1. Premolar: Nasal angle (+45°)
4. 2. Premolar and 1st Molar: Below the pupil (+35° to +45°)
5. 2nd and 3rd Molar: outer corner of the eye (+45°)

Mandible:

6. Central and lateral anterior teeth on both sides (–20°)
7. Central and lateral anterior teeth on one side: –20°)
8. Canine/1st Premolar (–10°)
9. 2. Premolar and 1st Molar (–5° to –10°)
10. 2nd and 3rd Molar (–5°)

3. Bitewing exposure



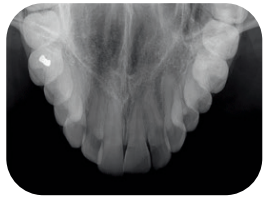


In addition to the crown area, the bitewing radiograph shows the neighbouring tooth necks and the course of the bone border of the alveolar ridge. The root tips are not the focus of this exposure technique. Bitewing radiographs allow a variety of conclusions to be made about the condition of the posterior teeth and their periodontium without exposing the patient to high doses of radiation.

- Caries diagnostics
- Periodontological diagnostics
- Checking the margins of fillings

4. Occlusal images

Occlusal images are taken, for example, to clarify salivary stones or to determine the position of displaced retained teeth. For this purpose, the image plate is placed on the occlusal plane of the dental arch without a holder system. The size 4 image plate is recommended for this application.



Imaging the upper jaw

- The size S4 image plate is fixed by occluding the upper and lower jaw. The use of a bite guard is recommended.
- The central beam hits the image plate at a 70° angle through the root of the nose.

Imaging the lower jaw

- The size S4 image plate is fixed by occluding the upper and lower jaw. The use of a bite guard is recommended.
- The central beam hits the image plate at a 90° angle through the floor of the mouth.

Holder systems for parallel technique in intraoral X-ray imaging

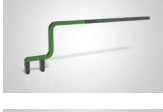
It is necessary to use the parallel technique to achieve imaging results that are free from distortion and incorrect proportions.

In this case, an appropriate holder system is required that aligns the image plate in a defined position and angle with respect to the X-ray beam. VistaPosition PSP from Dürr Dental ensures correct and easy-to-learn positioning of the image plate in every possible region of the patient's mouth.

1 unit	VistaPosition Indicator Arm Anterior Titanium	2130100351
1 unit	VistaPosition Indicator Arm Anterior	2130100427

1 unit	VistaPosition Indicator Arm Posterior Titanium	2130100350
1 unit	VistaPosition Indicator Arm Posterior	2130100426

1 unit	VistaPosition Indicator Arm Bitewing Titanium	2130100344
1 unit	VistaPosition Indicator Arm Bitewing	2130100428



1 unit	VistaPosition Indicator Arm Endo Titanium	2130100341
1 unit	VistaPosition Indicator Arm Endo	2130100429

1 unit	VistaPosition Aiming Ring Anterior	2130100354

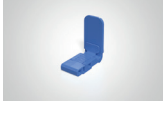
1 unit	VistaPosition Aiming Ring Posterior	2130100355

1 unit	VistaPosition Aiming Ring Bitewing	2130100349

1 unit	VistaPosition Aiming Ring Endo	2130100343

Moreover, VistaPosition PSP reliably fixes the image plate in place and also protects it from premature wear.

The colour coding, which has been familiar for years, simplifies the proper assembly of the system. The final check through the aiming ring ensures that the system is properly prepared.



4 unit	VistaPosition PSP Bite Block Anterior	2130100352

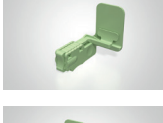
4 unit	VistaPosition PSP Bite Block Posterior	2130100353

4 unit	VistaPosition PSP Bite Block Bitewing S2 Vertical	2130100346

4 unit	VistaPosition PSP Bite Block Bitewing S2 Horizontal	2130100347

4 unit	VistaPosition PSP Bite Block Bitewing S3	2130100348

4 unit	VistaPosition PSP Bite Block Bitewing S0/S1	2130100345



2 pcs	VistaPosition PSP Bite Block Endo Q2/Q4	2130100342

2 pcs	VistaPosition PSP Bite Block Endo Q1/Q3	2130100386

Tips and tricks for successful intraoral X-ray imaging with VistaPosition PSP

Positioning the patient

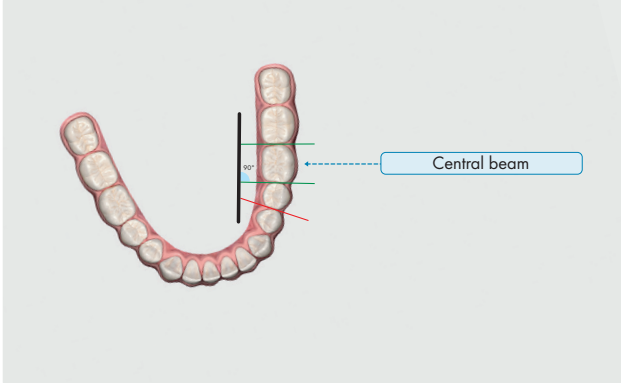
- Seated, both feet on the floor.
- Head resting on the headrest.
- With a straight back.
- Keeping the mouth slightly open to analyse the anatomical situation and determine the size of the image plate.
- Select the largest possible image plate.
- The patient has her/his arms at rest and breathes through the nose.
- If possible, do not touch the palate and tongue when positioning the image plate to minimise gagging.

Communicating with the patient during the positioning process

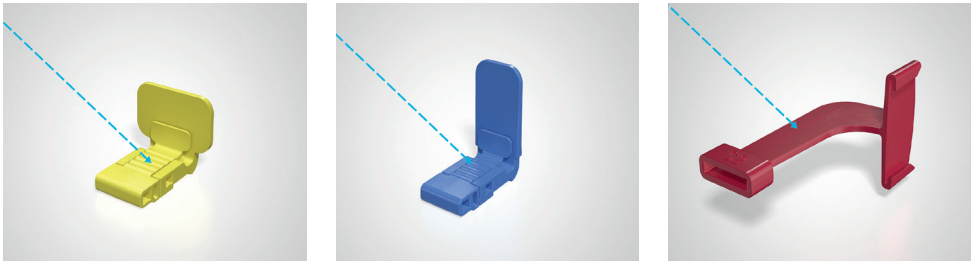
- 'Close your mouth slowly' instead of 'bite down'.
- 'Breathe calmly and only through the nose'.
- Relax your tongue, cheek, etc.
- For patients with a gag reflex, it helps to have the patient rinse with a mouthwash (e.g. with menthol or something similar) or cold water before positioning them.
- Use acupressure points on the forehead, chin and nose to reduce the gag reflex.
- Act calmly and confidently when you are working with the patient.
- Explain the process clearly.

Orthoradial alignment of the central beam

In order to visualise the interdental areas with as little overlap as possible, the beam must be aligned tangentially to the respective contact surface. Look from the occlusal side to check how the contact surfaces are arranged. Then select the angle of incidence of the central beam according to their alignment.



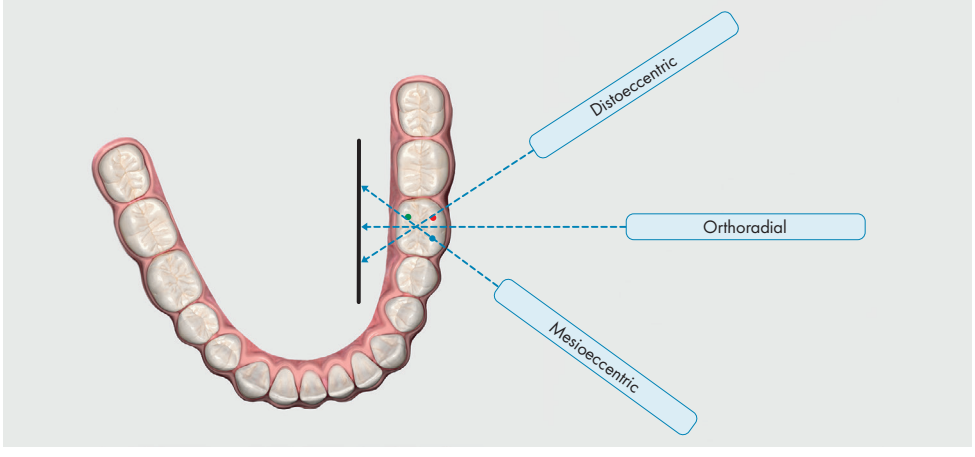
Orthoradial alignment of the central beam according to the respective interdental spaces.



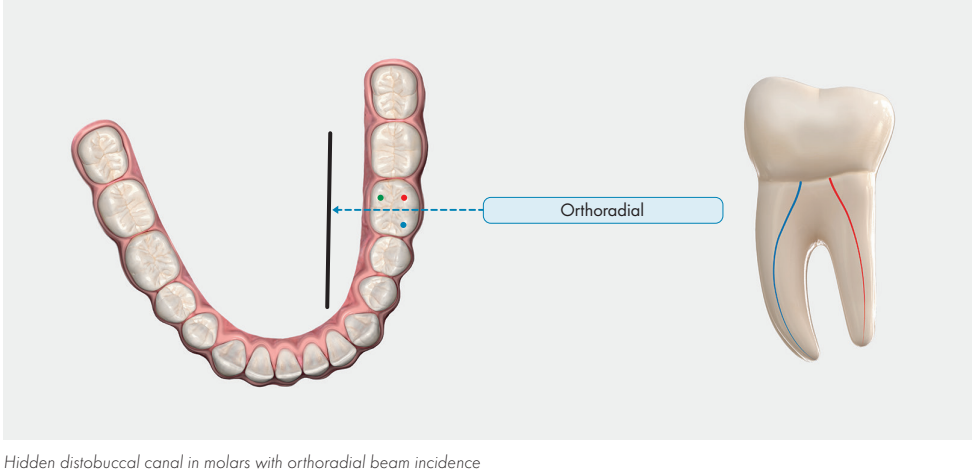
The bite blocks of VistaPosition PSP have orientation lines that can help with the alignment of the holder by aligning them at right angles to the respective interdental space.

Eccentric alignment of the central beam

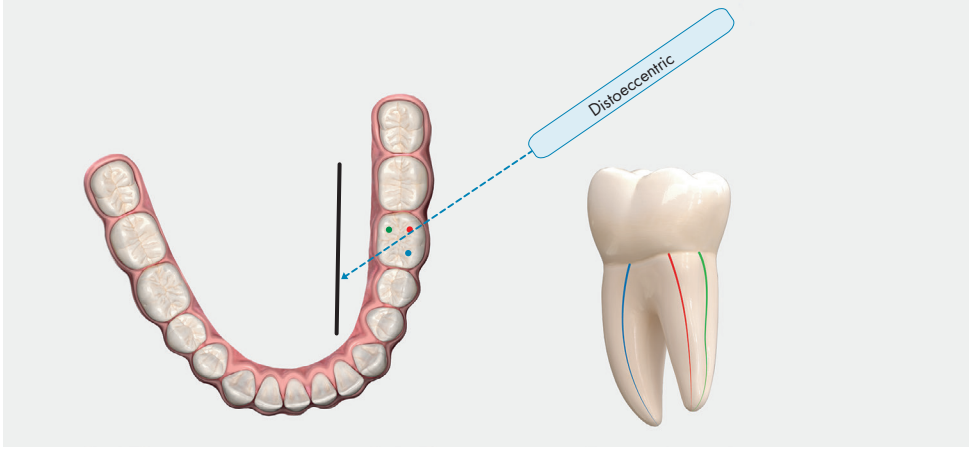
Eccentric alignment of the central beam may be necessary if the focus is on the diagnosis of root canals. In order to visualise the palatinal or labial root canal on the X-ray image, align the central beam eccentrically. With molars, the central beam is usually aligned disto-eccentric, with premolars rather mesio-eccentric.



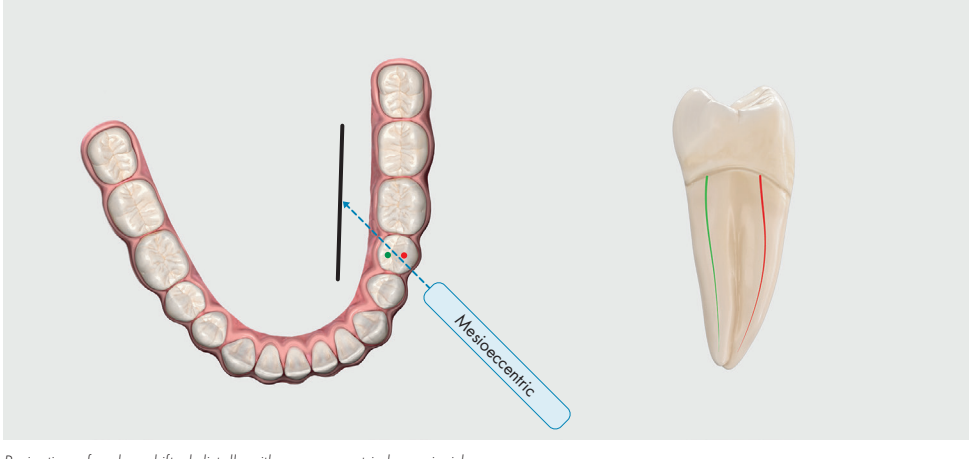
Canals are displayed differently depending on different angles of incidence.



Hidden distobuccal canal in molars with orthoradial beam incidence



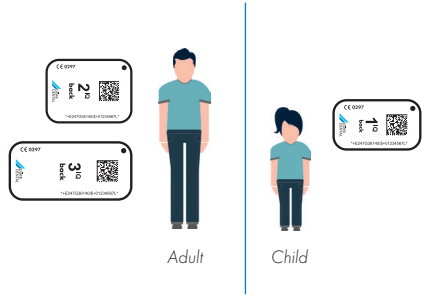
Projection of molars shifted mesially with disto-eccentric beam incidence



Projection of molars shifted distally with meso-eccentric beam incidence

Positioning of image plates

Bitewing exposures



Position the image plate between the tongue and the dental arch on the side to be imaged and actively guide the bite block downwards so that contact is made with the occlusion. Ask the patient to slowly close their mouth.

Slide the aiming ring against the cheek and position the X-ray tube, aligned parallel to the indicator arm, on the aiming ring. Finally, align the radiation field limitation according to the position of the image plate using the markings on the aiming ring.

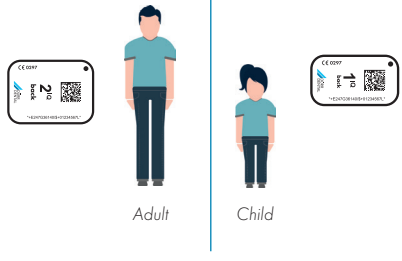
Possible challenges

1. Patient is unable to close the mouth
   - For patients with a high oral floor or a tapered palatal plate, place the image plate on the back of the tongue so that it is in the centre of the oral cavity.
2. Overlapping of the interdental spaces on the image
   - Align the image plate orthoradially according to the interdental space to avoid overlapping on the image.
3. Premolars are not completely imaged
   - Place the image plate on the back of the tongue and rotate the holder so that the image plate is aligned parallel to the premolars. The front edge of the image plate should be positioned as close as possible behind the anterior tooth region.

Alignment of the bitewing holder for premolar exposures

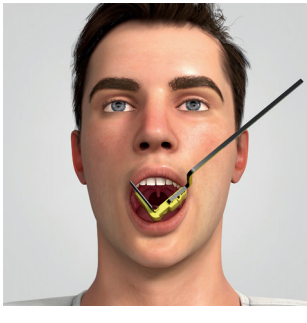
Upper jaw

Upper jaw posterior tooth exposures

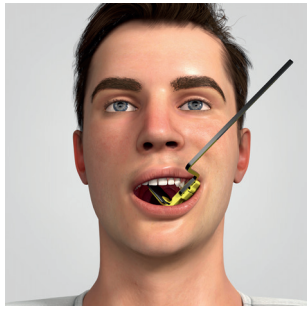


Place the bite block and the image plate, aligned in the shape of a 'V', in the oral cavity and position the upper edge of the image plate at the apex of the palate. Next, tilt the bite block against the occlusion of the tooth to be imaged. Make sure the image plate is aligned orthoradially to avoid overlapping.

Slide the aiming ring against the cheek and position the X-ray tube, aligned parallel to the indicator arm, on the aiming ring. Finally, align the radiation field limitation according to the position of the image plate using the markings on the aiming ring.



Inclination of the holder during insertion for exposures in the upper jaw.

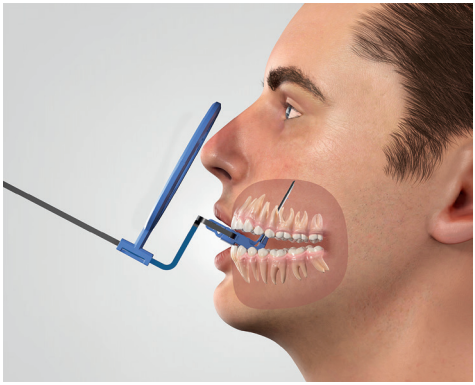


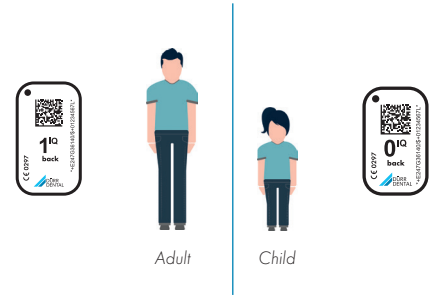
Before closing the mouth: Make contact between the bite block and the cusp of the tooth to be imaged.

Possible challenges

1. Pain when closing the mouth
   - First seek contact with the buccal cusp of the tooth to be imaged with the bite block and avoid contact between the image plate and the palate. Closing the mouth, contact with the palate is established automatically.
   - Have the patient close the mouth slowly and make sure that you only support, rather than hold, the bar of the holder system in position while the patient closes the mouth!
2. Root tips are not imaged
   - It is imperative that the bite block is firmly fixed by the upper and lower jaws once the mouth is closed.
   - Position the upper edge of the image plate in the centre of the palate and tilt the ribbed part of the bite block to the buccal cusp of the tooth to be imaged. Then have the patient close the mouth such that a good final bite is achieved.

Upper jaw anterior tooth exposures





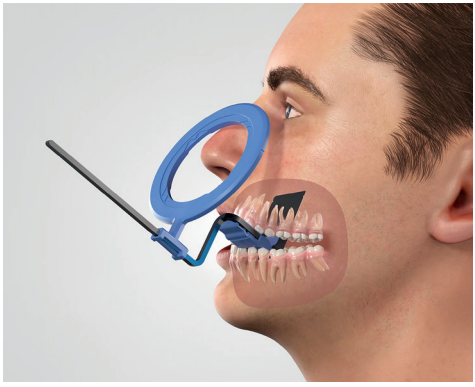
Place the upper edge of the image plate on a sufficiently wide part of the palate. The image plate should not bend at the edges. Tilt the bite block to the incisal edge of the front. Have the patient push the lower jaw forwards when he/she closes the mouth. To prevent the bite block from tilting away, you can place a roll of cotton wool between the bite block and the opposing jaw.

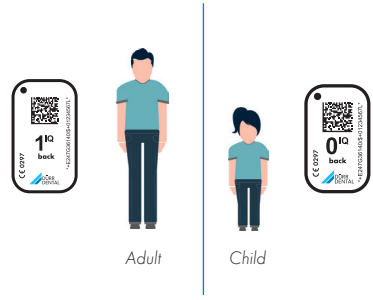
Slide the aiming ring against the cheek and position the X-ray tube, aligned parallel to the indicator arm, on the aiming ring. Finally, align the radiation field limitation according to the position of the image plate using the markings on the aiming ring.

Possible challenges

1. Root tips are not imaged
   - Position the upper edge of the image plate further back on the palate.
   - Use a size 1 image plate.
2. Roots are displayed too short
   - Position the upper edge of the image plate further back on the palate. Make sure that the indicator arm protrudes as horizontally as possible from the oral cavity. To achieve this, you can place a small roll of cotton wool between the bite block and the tooth to be imaged.

Upper jaw canine exposures





Place the upper edge of the image plate on a sufficiently wide part of the palate. The image plate should not bend at the edges. Now turn the holder until the bite block is situated beneath the tip of the canine. Then move the bite block into contact with the canine tip and have the patient close the mouth. Make sure that the patient pushes the lower jaw forwards in the direction of the respective canine.

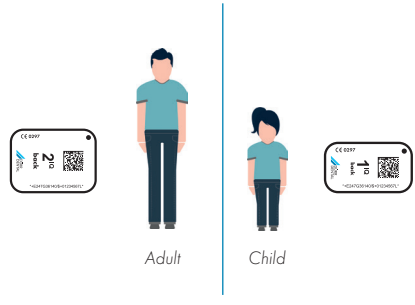
Slide the aiming ring against the cheek and position the X-ray tube, aligned parallel to the indicator arm, on the aiming ring. Finally, align the radiation field limitation according to the position of the image plate using the markings on the aiming ring.

Possible challenges

1. Root tips are not imaged
   - Position the upper edge of the image plate further back on the palate. This may well be in the region of the molars. Make sure that you maintain the position of the image plate on the palate when you turn the holder.
2. Bite block tilts away while the mouth is being closed
   - In this case, place a roll of cotton wool between the bite block and the opposing jaw. The roll of cotton wool compensates for slanted incisal edges, which are responsible for the image plate tilting away.

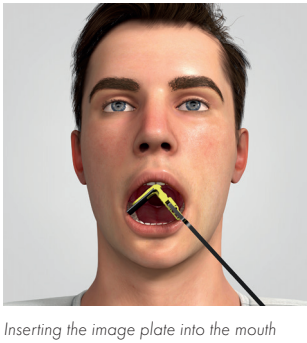
Mandible

Lower jaw posterior tooth exposures



Place the bite block and the image plate, aligned like the roof of a house, in the patient's mouth. Place the image plate between the tongue and the dental arch behind the region to be imaged. Make sure the image plate is aligned orthoradially to avoid overlapping. Make sure that the patient fixes the bite block firmly through final occlusion and that the indicator arm protrudes as horizontally as possible from the mouth.

Slide the aiming ring against the cheek and position the X-ray tube, aligned parallel to the indicator arm, on the aiming ring. Finally, align the radiation field limitation according to the position of the image plate using the markings on the aiming ring.



Inserting the image plate into the mouth for positioning in the lower jaw.

Possible challenges

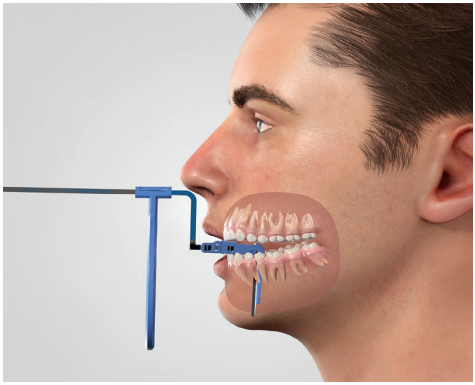
1. Patient cannot close because the floor of the mouth is too high.

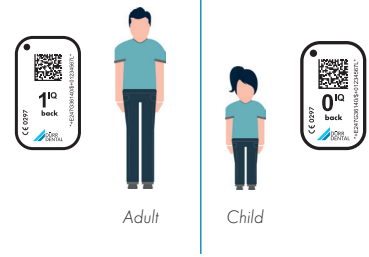
Tip 1: Position the image plate as far under the tongue as possible. At the 'chin-tongue bone muscle', the floor of the mouth is usually slightly lower and there is more space for the image plate.

Tip 2: Attach a cellulose swab soaked in cold water to the lower edge of the image plate. This relieves the mucous membrane of the base of the mouth.

2. Root tips are not imaged
   - It is imperative that the patient firmly fixes the bite block after the mouth is closed.

Lower jaw anterior tooth exposures





Place the image plate between the tongue and the dental arch behind the anterior tooth region of the lower jaw. Make sure that the patient pushes the lower jaw as far forward as possible when he/she closes the mouth so that the bite block can be fixed firmly in place. While the patient closes the mouth, actively guide the indicator arm slightly upwards so that it protrudes from the mouth as horizontally as possible.

Slide the aiming ring against the cheek and position the X-ray tube, aligned parallel to the indicator arm, on the aiming ring. Finally, align the radiation field limitation according to the position of the image plate using the markings on the aiming ring.

Possible challenges

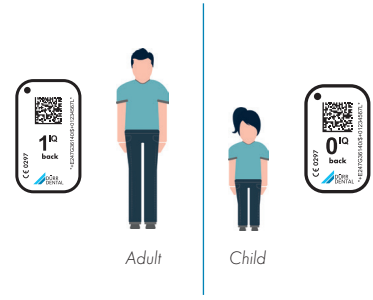
1. Patient cannot close the mouth because the floor of the mouth is too high.

Tip 1: Position the image plate as far under the tongue as possible. At the 'chin-tongue bone muscle', the floor of the mouth is usually slightly lower and there is more space for the image plate.

Tip 2: Attach a cellulose swab soaked in cold water to the lower edge of the image plate. This relieves the mucous membrane of the base of the mouth.

2. Image plate tilts away when the mouth is being closed.
   - In this case, place a roll of cotton wool between the bite block and the opposing jaw. The roll of cotton wool compensates for slanted incisal edges, which are responsible for the image plate tilting away.
3. Pain due to a pronounced frenulum of the tongue?
   - Take images on the left and right of the frenulum of the tongue.

Lower jaw canine exposures



Place the image plate between the tongue and the dental arch behind the anterior tooth region of the lower jaw. Now turn the holder until the bite block is above the tip of the canine. While the patient closes the mouth, actively guide the indicator arm slightly upwards so that it protrudes from the mouth as horizontally as possible. Make sure that the patient pushes the lower jaw forwards in the direction of the corresponding canine tooth when he/she closes the mouth.

Slide the aiming ring against the cheek and position the X-ray tube, aligned parallel to the indicator arm, on the aiming ring. Finally, align the radiation field limitation according to the position of the image plate using the markings on the aiming ring.

Possible challenges

1. Root tips are not imaged
   - It is imperative that the patient firmly fixes the bite block after the mouth is closed.

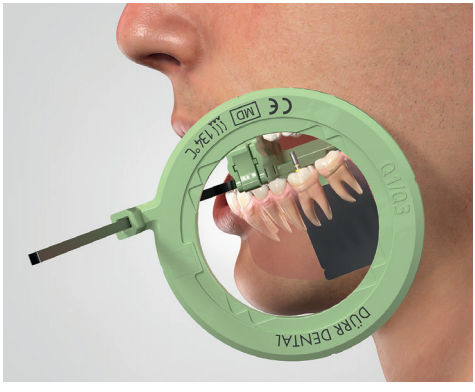
Tip 1: If the floor of the mouth is high, position the image plate as far under the tongue as possible. At the 'chin-tongue bone muscle', the floor of the mouth is usually slightly lower and there is more space for the image plate.

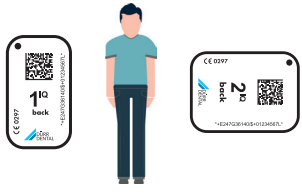
Tip 2: Attach a cellulose swab soaked in cold water to the lower edge of the image plate. This relieves the mucous membrane of the base of the mouth.

2. Image plate tilts away when the mouth is being closed
   - In this case, place a roll of cotton wool between the bite block and the opposing jaw. The roll of cotton wool compensates for slanted incisal edges, which are responsible for the image plate tilting away.

Special cases

Exposures with rubber dam and endo-files being in situ

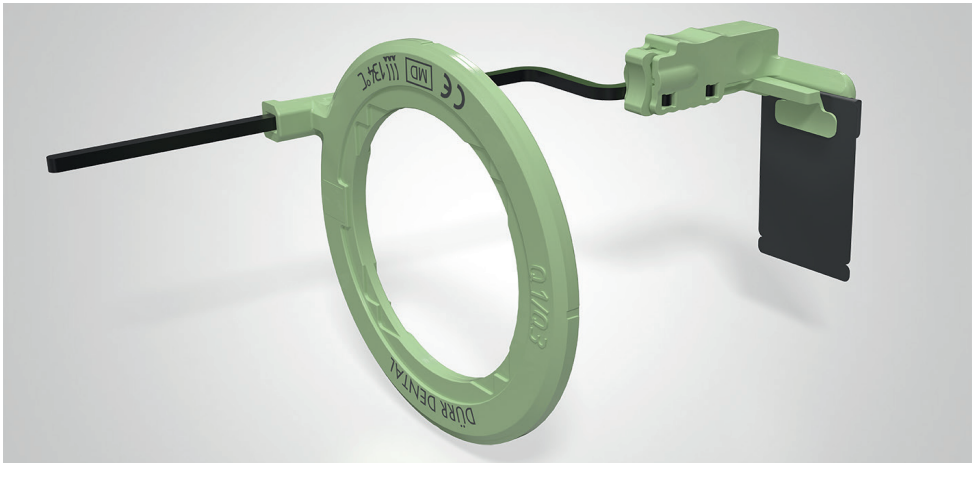




Adult

Insert the image plate into the mouth with the lower edge leading, and position it behind the tooth to be imaged. The Endo bite block has a bar that is placed mesial to the rubber dam clamp and ensures that the patient can close the mouth despite endo instruments or a rubber dam clamp being in situ. Good final occlusion is necessary to fix the image plate in the correct position.

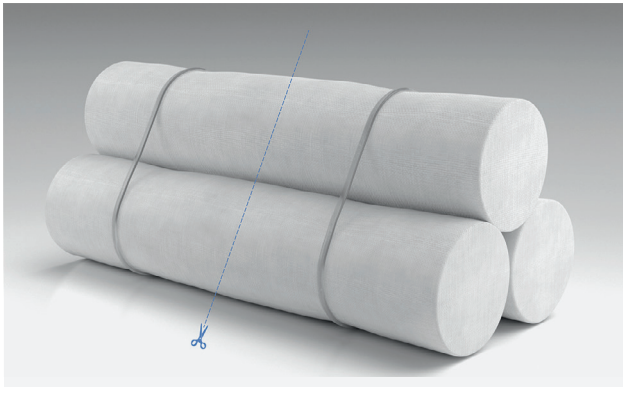
Slide the aiming ring against the cheek and position the X-ray tube, aligned parallel to the indicator arm, on the aiming ring. Finally, align the radiation field limitation according to the position of the image plate using the markings on the aiming ring.



Exposures in an edentulous jaw

In general, the application recommendations for dentate jaws also apply to edentulous jaws. In edentulous regions, it makes sense to use a spacer to make sure that the image plate is well positioned in this anatomical setting.

This spacer can consist, e.g., of three cotton rolls tied together with dental floss to form a package of rolls. The spacer thus is firmly seated on the alveolar ridge and is large enough to compensate for the missing dentition.



Missing teeth can also make it difficult to position the bitewing holder. Therefore, turn the bite block by 180°. Please make sure to align the active side of the image plate toward the ring.

Exposures of wisdom teeth

Taking images of wisdom teeth, the recommendations for posterior tooth images in the upper or lower jaw apply.

Due to the anatomical position of the wisdom teeth, it may be necessary to position the image plate very far in the back. As this is often made rather difficult by the gag reflex, there is the option in these cases to take a disto-eccentric image of the wisdom tooth. This is described in the chapter on ‘Orthoradial and eccentric exposures’.

Adult

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