

**Blockbook "Endo 1"**

# **Endodontics 1**

Part 2: Practical Manual  
2023-2024 B3Td1t



# **Endodontics 1**

## **B3Td1t**

**Blockbook Endodontium 1-2023-2024**

Dentistry

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**Practicumhandleiding**



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***Read the manual for each practical in advance. The theory can be found in the reader and is discussed in the various lectures.***

## **ZS 0 / Practical 1**

### **Selecting elements and arranging them in a phantom jaw, taking X-rays, self-study**

#### ***Background***

***For the preclinical phantom assignments it is necessary to collect various natural teeth. Some of this is set up in a phantom jaw.***

#### **Instruction**

1. View the presentation "Selecting preclinical instruction elements" on Brightspace
2. Isup, Csup, Psup, Msup, linf, Cinf, Pinf, Minf. You will need four copies of each of these elements. You will need two series of elements to practice making openings by hand; These may be slightly carious and have immature roots (if they are elements for hand-held practice) in order to study the internal anatomy after cutting. The elements should preferably be chosen in such a way that they can be used for each part of the various practicals.
3. Two series, but with mature roots, preferably with no large root curvature (not more than  $150^\circ$ ). This concerns elements for practice and testing of endodontic openings and complete root canal treatments in the phantom jaw. Select an extra Minf, Msup and linf and, if appropriate, place them in the jaw as spare elements. A central and lateral incisor applies to the upper jaw.
4. After approval of all teeth, signed off assessment form 1, a phantom model, upper and lower jaw, of the teeth mentioned under 2 can be made. *You can do this outside of practical time if necessary*
5. The teeth in question are, after cleaning and blow dry, with the apical 4 to 5 mm dipped in liquid wax, so that a thin layer of wax remains on the roots. The wax layer makes it less difficult to see the contours of the radices on X-rays taken for the treatments to be carried out.

The wax is liquefied in a glass jar, heated to 80°C in a water bath; provision via the counter. The elements pretreated in this way are then placed in the correct position

place in the rubber molds borrowed from the counter.

(The distal surface of the elements should be directed distally and the buccal surface should be directed buccally.)

A rubber cuff is placed around this rubber mold. This mold and the cuff are filled with plaster. The cover plate into which the metal retention plate is screwed with the largest circumference of that

retention plate facing the plaster is also filled with plaster and placed on the cuff.

6. After the plaster has hardened, the mold is first removed, after which the cover plate can also be removed. The jaw can be neatly finished using a plaster trimmer and cutter. To achieve the best possible contrast on the X-rays, it is important to finish the models thinly on the outside. By deepening the 'floor of the mouth' even more with a burr, the X-rays can certainly be placed deep enough to make periapical images. Also remove any plaster from the natural elements, and separate natural elements placed next to each other; It must be possible to apply a rubber dam to these elements, but it does not have to be completely inverted could be. Allow the jaw to harden thoroughly. Keep the jaw wet between practicals to prevent damage to the natural elements due to dehydration.

Take x-rays of the teeth arranged in the jaw, with the crown and root tip fully exposed, and place them in a new status praesens in DiGora. These so-called "initial photos" can be used to estimate how difficult it will be to make the opening. If the pulp chamber is large and clearly visible, the opening will probably be easier to make than in a situation where the pulp chamber is not or barely visible. Take the x-rays as you learned during the x-ray practical. For additional information, please refer to the council, also available on Brightspace.

### **Product**

Two series of elements of each type in the lower and upper jaw for practicing opening by hand. Two series of each type in a lower and upper jaw, for practicing endodontic treatments on a phantom jaw. All lengths of the teeth in the jaw are known and you have noted them down.



## Endodontic openings

### Background

For good endodontic treatment, a thorough knowledge of the anatomy of the various teeth is essential. The chance of making mistakes during treatment is smallest if you have a good three-dimensional representation of the pulp chamber and root canal system.

To achieve this internal anatomy, to be studied in natural elements endodontic openings are made and the elements are then cut in a horizontal direction at different levels.

In self-study assignment 1 you studied the endodontic openings per tooth type based on the anatomy of the pulp chamber, the number and location of root canals. During this practical you will put this into practice by making a correct endodontic opening in natural teeth. You can use the images of elements with an endodontic opening that are available on Brightspace.

### **Practical 2/3/4/5: Opening the non-cast teeth: hand-held openings**

**Practical 2: Opening by hand quickly: at least 4 elements, finishing the phantom jaw**

**Practical 3: Opening by hand quickly: minimum 4 elements, finishing phantom jaw**

**Practical 4: Opening from hand: score**

**Practical 5: Opening from hand: score**

You have selected two series of individual elements. In the *first series* you are supposed to quickly make an endodontic opening, as you studied in self-study assignment 1, after which you cut the element horizontally at different levels to study the anatomy of the pulp chamber and root canal system. You will not receive an assessment for this series of openings, but it must be signed off. The importance of the exercise is that you become familiar with the internal anatomy of the various elements. This ensures that you can make the endodontic opening in a targeted manner and that there is less chance of unpleasant complications such as a perforation developing.

In the *second series* you will make the standard endodontic opening for each (separate) element. You will receive an assessment for these openings.

## **Practicum 6: Canal preparation with hand instruments**

### **Working group (WG) E: Explanation of canal preparation with hand instruments:**

#### **Practical instruction: Coronal hand preparation and cleaning (Practicum 6)**

##### **Background**

Before the NiTi instruments were introduced into endodontics treatment, the canals were prepared with stainless steel hand instruments (hand files). Even when a canal is prepared with mechanically driven instruments, the canal must be made accessible with hand instruments (the so-called glide path). In addition, this "old-fashioned" method of preparation can help with some problems that may arise during endodontic treatment (ledges; difficult curvature).

In practical 6 you will learn how to perform these techniques on a perspex block.

In this practical assignment you will put these techniques into practice by performing a root canal preparation in a plastic block with a curved root canal using Protaper SX and hand files.

The plastic block is cleaned with air (and possibly tap water instead of NaOCl).

A step-down approach is chosen for canal preparation. The pulp chamber and the canals are prepared from coronal to apical with various instruments of increasing thickness, creating space for cleaning with NaOCl. An estimate of the root anatomy can be made based on the initial photo. The photo shows the number of roots, the length of the roots and the degree of root curvature. In the coronal phase we first instrument the coronal part of the root. For optimal results, the canals must then be prepared and cleaned up to the apical constriction. The apical constriction is located 1 to 1.5 mm from the radiographic apex. This means that during the final shaping of the canal, the files must be able to reach the canal up to that distance from the radiographic apex.

##### **Execution of coronal phase with Protaper SX**

1. For the perspex block, the preparation length (final working length) is determined by subtracting 1 mm from the length at which the file just emerges through the "apical foramen".
2. First, check the patency of the coronal part of the canal. The working length of the coronal phase is the length of the canal minus 6 mm. (Hand) file 10, 15 and 20 are successively introduced into the canal. Sometimes this is effortless, sometimes a little preparation is required, using the balanced force technique.
- 3.

From file 25 onwards it will be more difficult to prepare the canal, especially because it is a curved canal. Prepare up to file 35 using the balanced force technique so that file 35 can be lengthened effortlessly.

#### Practical instruction: Apical hand preparation

After the coronal phase, in which the majority of the canal has been cleaned and made accessible for instrumentation, the further canal can be prepared for chemical cleaning and restoration after the working length determination.

4. Have this checked by the hall instructor. (There may be apical transport due to careless preparation.)

During the entire preparation, natural elements are 5. rinsed abundantly with sodium hypochlorite (at least 2 cc per rinse, but in any case until hypochlorite is sucked up that is no longer contaminated by swarf). Make sure that the needle is properly screwed onto the syringe and that there is no air in the syringe. It is better to use water or air with the perspex block. 6.

Have the completed preparation checked.

#### Product

Hand preparation with hand files of a curved root canal in a plastic block, signed on assessment form 2A.

### **Working group (WG) F: Explanation of canal preparation with mechanically driven instruments:**

#### **Practicum 7**

##### ***Practical training I.:***

##### ***Coronal phase***

A step-down approach is also chosen for canal preparation.

The pulp chamber and the canals are prepared from coronal to apical with various instruments of increasing thickness, creating space for cleaning with NaOCl. Before the canal entrances and the upper part of the canal are widened, it must first be checked whether the canal is accessible with a file size 8. If this is the case, the entrance is opened with a so-called Protaper-SX file, a mechanically driven NiTi instrument. and the upper part of the canal dilated.

The instruments are placed in the canal while rotating; After a maximum of 5 seconds or 3 'picks', the mechanically driven Protaper-SX file is removed from the canal, the patency is checked with a file 8 (recapitulate) and flushed again. It is a consideration to extend the hand file a little beyond the length at which the coronal phase is performed to ensure that debris pushed apically in front of the instrument does not obstruct the canal.

## **Practical training II.:**

## **Disinfection**

### **Background**

In self-study assignment 3 you discussed the operation and requirements of disinfectants for root canal treatment. The use of a disinfectant is essential for the success of endodontic treatment, the instruments only create space for rinsing. Although sodium hypochlorite has been proven to be a safe drug, complications can still occur. It is important that you are well informed in advance of any objections.

### **Instructions**

3. Write a protocol for the safe use of NaOCl, describing the side effects and how to act. This includes rubber dam, safe-end needle, concentration, air, extractor and other protection.
4. Prepare a syringe with NaOCl for use
5. Disinfect a channel of an element, paying close attention to the effect of the disinfectant on the environment and the channel contents.

### **Products**

You have a protocol for the use of disinfectant, specifically sodium hypochlorite, and know how to act in the event of complications. Furthermore, you are able to handle this product safely

## **Practical instruction III.: Working length determination**

### **Background**

In self-study assignment 3 you discussed the anatomical factors that determine what the apical end point of the root canal preparation and root canal filling should be.

Before proceeding with preparation of the apical part of the root canal system, the apical end point, or the working length, must be known. The working length is determined in the preclinical practical using a length photo. The electronic height meter is used for patient treatment. It goes without saying that an X-ray is unnecessary when determining the working length of the transparent plastic block.

### **Plastic block instructions:**

1. For the perspex block, the preparation length is determined by the length at which the file just emerges through the "apical foramen", be reduced by 1 mm.

2. The working length is recorded correctly: WL ... mm (working length), ref. pt.(reference point): top of the plastic block.
3. Unfortunately, electronic length determination is not possible in the phantom jaws we use. The length is determined by measuring the length of the element in Digora. The preliminary working length is the distance from the cusp tip to 2 mm in front of the radiographic apex. The accessibility of the canal at this length is checked with a file 8 and a file 10. A glide path is then created with a Goldglider file (motor setting "Wave-one"). The canal is now accessible for a file 15. A photo is taken of the element with the file(s) in the canal(s). This is the so-called "length photo". In order to see the file clearly in the photo, it is important that it is not too thin. In the phantom jaw, the minimum thickness of the file is therefore 20 (this means that after the Goldglider (size 15) a little preparation is sometimes required with the 20 hand file). In addition, it is important that the file used to take the longitudinal photo has retention in the canal. If the file is too loose it may move during the photo taking process. This makes the result of the photo unreliable. *So: the minimum thickness must be 20, but the file must also have retention and can therefore be thicker.*

The photo checks whether the provisional working length is too short, too long or correct. With a good working length, the file ends 1 to 1.5 mm from the radiographic apex. The reference point is chosen in such a way that the rubber stop on the file rests passively and reproducibly on the reference point. Often this is a cusp crest, cusp slope, incisal edge or edge ridge. An estimate is made from the adjustment of the provisional working length to a final working length. The final working length is determined together with a teacher.

PLEASE NOTE: in the clinical situation, a length photo is only taken after an electronic working length determination has been carried out. In the clinical situation, an adjustment to the working length will be necessary much less often than in the preclinical situation. If, based on the photo, an adjustment to the working length appears to be necessary, this adjustment is checked by repeating the electronic length determination.

In the phantom situation, the longitudinal photograph is taken with the files 2 mm shorter than the estimated length, while the intention is to prepare and clean up to 1 to 1.5 mm of the radiological apex. The reason for this is that there may be distortion in the photo that makes the radix appear longer than it actually is. To reduce the chance of preparation through the foramen, a small safety margin has been built in. It is better that the working length should be lengthened after taking the photo rather than shortened. (In the latter case, the foramen has been damaged by instruments).

#### **Practical instruction IV.: Apical preparation**

##### **Background**

After the coronal phase, in which the vast majority of the pulp space has been cleaned and made accessible for instrumentation,

working length determination the further canal is prepared for chemical cleaning and restoration.

1. During the length determination, a sliding path has been prepared in the channel up to the provisional working length. In the apical phase, this preparation is adjusted, if necessary, until the final working length is reached. First with a hand file 8 and 10 and then with the Goldglider.
2. After the canal has been prepared to working length with the Goldglider, the canal preparation can be brought into its final shape. This is first done with a Wave-One 25/07 (the red Wave-One). Place the Wave-One loosely in the canal entrance and prepare under light pressure for 3 seconds towards the apex with a so-called pecking motion. The file is now removed from the canal, still reciprocating. It is then rinsed with 2 cc of NaOCl and recapitulated with a 10 file. The windings of the Wave-One are cleaned with a gauze pad with alcohol and then the Wave-One is prepared again in the same way. This procedure is repeated until the 25/07 reaches working length.
3. After preparation with the Wave-One 25/07 to working length, the preparation is completed by preparing to working length in the same way with the Wave-One 35/06 (the green Wave-One). The canal is now prepared wide enough to clean the apical part with NaOCl.

## **Practical instruction V.: Root canal filling**

### **Background**

In self-study assignment 8 you delved into the methods of filling a prepared root canal with gutta-percha. You will apply a method of this, namely cold lateral condensation, on the prepared root canal in the plastic blocks and later of course on the other natural elements

### **Instructions**

1. Fit the Gutta-percha (GP) main post and the spreader and root canal plug into the prepared root canal. The main pin must come to length and have (a little bit) retention; the spreader is set to the working length and the root canal plugger should not get stuck in the canal entrance.
2. Prepare root canal sealer and prepare the secondary posts. The main pin and the additional pins are dipped in alcohol or sodium hypochlorite and then placed on a clean gauze pad. To avoid contamination, do not touch the pins with your fingers, but use tweezers.
3. Have these steps checked by the hall instructor.
4. Fill the root canal with cold lateral condensation of gutta-percha and sealer.
5. Have it checked whether the canal is sufficiently filled

6. Remove excess GP down to the canal entrance with a heat carrier/PKT wash-up instrument. In front elements the GP must be up to 2 á 3 mm below the enamel-cementine border. The sealer can cause discoloration of the element.  
NB! The root canal plugger should not be used to melt off excess GP. These instruments cannot withstand heat and can no longer be used after heating. The heat carrier is made for this.
7. If necessary, take two x-rays of the end result: one transverse and a sagittal.
8. Have this assessed as a final assessment and signed off on Form 2.

Product

Filled curved root canals in the plastic cubes

After completing the handheld openings, the first series of teeth positioned in the phantom jaw are opened endodontically.

Before an endodontic opening is made, it is important to look closely at the initial photo to estimate the complexity.

## **Practical 8/9: Opening the teeth in the phantom jaw**

### ***Practical 8: Opening in the jaw: upper jaw***

### ***Practical 9: Opening in the jaw: lower jaw***

In teeth, the contours of the intended endodontic opening are prepared with rapid action and cooling (red corner piece) to a depth of 2 mm. Have this opening checked by a teacher. It is particularly important at this stage to check that the opening has been prepared in the correct position, has the correct shape and is axially aligned. (There are practitioners who choose to apply rubber dam at this time to prevent contamination of the pulp chamber after opening as much as possible. The disadvantage of this is that it limits the overview of the anatomy of the element. For this reason, it was decided not to construct the rubber dam during this practice phase until the endodontic opening is (almost) ready.) The pulp chamber can then be opened. After this, the pulp roof is removed. The endodontic opening is ready when a good overview of the pulp floor with the canal entrances has been obtained.

NB: Sometimes the pulp chamber is obliterated with tertiary dentin or irregular calcifications. This complicates the production of the endodontic opening. When calcified material must be removed from the pulp chamber, great care must be taken not to damage the walls and bottom of the pulp chamber. The pulp chamber floor is located at or just below the level of the enamel-cementum interface. This means that drilling away calcified material should always be limited to coronal to the enamel-cementum interface.

### **Products**

Endodontically opened teeth from the hand and in the phantom jaw. Assessed and signed off on form 1. When handing in form 1 to the laboratory management, all loose hand-opened elements must also be handed in at the dirty counter. This is after completing all preclinical practicals.



## **Practicum 10/11: Root canal treatment with rotary NiTi-instrument van element 1 sup**

***Practical 10: Upper incisor rotating NiTi instruments***

***Practical 11: Upper incisor rotating NiTi instruments***

***This instruction also applies to a limited extent to the perspex block on which hand preparation is practiced for the first time.***

### **Background**

In this practical you will put into practice what you have learned from the previous self-study assignments and preclinical practicals in a natural tooth element in the phantom jaw: the I sup. The root canal in question is prepared according to the described method, in which it is cleaned by continuously rinsing with sodium hypochlorite.

After preparation and cleaning, the canal is temporarily closed with Cavit® and Glass Ionomer Cement. The element is not provided with a definitive composite restoration but with a temporary filling because at a later stage the element will be bleached with the "Walking bleach method".

### **Instructions**

1. Apply rubber dam and disinfect the work area with alcohol.
2. Rinse the pulp chamber with NaOCl,
3. Perform the coronal phase as described previously.
4. Determine the working length of the root canal:

### **Instructions for natural elements in phantom jaw:**

Unfortunately, electronic length determination is not possible in the phantom jaws that we use. The length is determined by measuring the length of the element in Digora. 2 mm is subtracted from this estimated length to determine a provisional working length. The accessibility of the canal at this length is checked with a file 8 and a file 10. A glide path is then created with a Goldglider (motor setting "Wave-one").

The canal is now accessible for a file 15. A photo is taken of the element with the file(s) in the canal(s). This is the so-called "length photo". The photo checks whether the provisional working length is too short, too long or correct. A good working length is 1 to 1.5 mm from the radiographic apex. An estimate is made from the adjustment of the provisional working length to a final working length. The final working length is determined together with a teacher.

The working length is recorded correctly: Rö: (the provisional

working length to which the file was set at the time the length determination photo was taken)

WL: the final working length, determined in consultation with the teacher

ref.pnt, the reference point on which the rubber stop rests. The reference point must be easily recognizable for everyone and must be chosen in such a way that the rubber stop on the file rests passively and reproducibly on the reference point. This is often a cusp crest, cusp slope, incisal edge or edge ridge. E.g. "the buccal cusp crest" but not "approximately halfway up the fissure on the slope in the buccal wall".

After the final working length has been determined, the canal preparation is completed. First, if necessary, the final working length is prepared with files 8 and 10 and the Proglider. The preparation is then completed with first the Wave-One 25/07 and then the Wave-One 35/06.

## Products

Diagnosis in the photo and in the journal of: the final working length, the provisional working length and the reference point and can indicate how this length was arrived at. Furthermore, the basic knowledge of taking X-rays has been refreshed.

1. Have these phases checked by the instructor and signed off on assessment form 2
2. Prepare and clean the apical part of the root canal up to and including the Wave-One 35/06
3. During the entire preparation, rinse abundantly with sodium hypochlorite (at least 2 cc per rinse, but in any case until hypochlorite is aspirated that is no longer contaminated by swarf). Make sure that the needle is properly screwed onto the syringe and that there is no air in the syringe; protect the clothing with a plastic apron.
4. Have the completed preparation checked.
5. The element is temporarily sealed with Cavit®: apply this with a Pfi 6/Ash 6 and press it firmly with a wet cotton plug.  
This also removes any excess.

(Intermediate) Product:

Prepared and temporarily closed root canal I sup.

The root canal is then filled in the same way as in the plastic block.

6. The temporary restoration is removed under a rubber dam (Sonicflex with cooling) and the canal is thoroughly rinsed with sodium hypochlorite.
7. Flush the canal with NaOCl.
8. Check the accessibility of the preparation with a hand file 30 and 35. (The canal was prepared until 35/06)
9. Prepare the material and instruments for filling.
10. Have this checked by the hall instructor.
11. Dry has root canal with paper pins.
12. Fill the root canal with cold laterally condensed gutta-percha and sealer up to the canal entrance. Before removing the excess GP, have a teacher check whether the canal is sufficiently filled.
13. Seal the tooth coronally with glass ionomer on a Cavit base. This is a temporary restoration. In practical 19 you will bleach the element using the "walking-bleach" method.
14. Take an x-ray of the end result.
15. Have this checked and signed off on Assessment Form 2

## Products

Filled root canal I sup in phantom jaw

## **Practical instruction 13 to 24: Root canal treatments with rotating instruments on phantom**

### ***Practical 13: Rotating Lower Premolar (loose)***

### ***Practical 14: Rotating Lower Premolar (loose)***

## **Background**

The lower premolar is opened endodontically while it is still in the jaw. A longitudinal photo is then taken with a file 20, which is set to a length 2 mm shorter than the estimated length of the element, in the canal. (This is not the order we discussed earlier and it is only done this way once. The reason for this follows)

The element is then removed from the jaw. (Remove the plaster lingually and buccally with a phrase and then carefully pry the tooth loose, if necessary with pliers.)

The root canal treatment is now performed while the element is held with the fingers. The idea behind this is that it can be felt once which forces are used during preparation. It is therefore most instructive to use an element with a narrow channel, which requires a lot of preparation.

After the coronal phase, the length of this element is determined electronically in a special setup. This electronically determined length can now be compared with the length that was previously determined radiologically when the tooth was still in the jaw. Because the apical foramen is not always located at the radiographic apex, these two values may be different.

The apical phase is then performed, again while holding the element with the fingers, at the working length that has been determined.

After the preparation is complete, the canal is filled with Gutta-percha. During filling, the element can be temporarily placed back in the jaw.

After the canal filling has been applied, two final photos are taken. One in bucco-lingual direction (as it is almost always made in the clinical situation). The second is made in the mesio-distal direction. In the clinical situation this will only be possible with extremely rotated teeth.

If the canal is oval (and this is often the case with a lower premolar), the canal filling may look a lot more compact on the photo taken from buccal to lingual than on the photo taken from mesial to distal.

## **Part objective**

You can perform a root canal treatment by hand. You have electronically determined the working length in a phantom setup.

**Practicum 15: Bovenpremolaar**

**Practicum 16: Bovenpremolaar**

**Practical 17: Lower incisor and bleaching upper incisor**

**Practical 19: Lower molar**

**Practical 20: Lower molar**

**Practical 21: Lower molar**

**Practical 22: Maxillary molar**

**Practical 23: Maxillary molar**

**Practical 24: Maxillary molar**

## Background

In order to further train you in performing root canal treatment, you will now perform root canal treatments on P inf, P sup, and M inf successively. In the upper and lower cuspids you only need to make the opening and have it marked. The endodontic openings of the P inf and P sup are closed with flowable composite and posterior composite.

On the lower molar, space is made in the distal canal for a post. The GP is removed until there is still 4 to 5 mm of apical closure of GP. The element is then closed with a temporary filling. Cavit is placed in the pulp chamber. The Cavit is covered with a layer of GIC with a thickness of 2 to 3 mm. This element will be used in the next academic year in the "pencil construction" block.

The set of preclinical practicals is completed with a practical test, consisting of the endodontic opening of one of the natural upper molars and a complete root canal treatment of that tooth. In consultation with a staff member, it is determined which upper molar will be used for this practical test.

The intention is that you carry out this treatment more or less independently and that you imitate the clinical conditions as much as possible.

## Part objective

You can perform the various phases of the root canal treatment in a phantom setup.

## Instructions

1. Apply rubber dam and disinfect the work area with alcohol.
2. Rinse the pulp chamber with NaOCl,
3. Check the patency of the canal, create the sliding path in the coronal part of the root canal. Dilates the canal entrance and the coronal part of the canal with the SX
4. Check the patency of the channel and create the glide path to the estimated working length with the Proglider.
5. Determine the working length of the root canal using a longitudinal photo. In case of a multi-canal tooth: use for the

- length photo K-files for the buccal canals and H-files for the palatal/lingual canals and insert from a horizontal angle of approximately 20 degrees.
6. Have these phases checked by the teacher and signed off on form 2.
  7. Check the patency of the canal at the final working length and create the glide path to this working length with the Proglider.
  8. Prepare the canal to the working length with the rotary 25/.07  
The canal will then, in almost all cases, be prepared with rotary 35/06.  
Always rinse the root canal after removing an instrument.
  9. Have the preparation checked by the room instructor.
  10. Any element that is not performed with gutta-percha during the same practical filled, is temporarily closed with a layer of Cavit on the floor of the pulp chamber and GIC as an occlusal seal.
  11. The canals are filled by cold lateral condensation of Gutta -Percha and AH-plus. Have the main pin(s) checked by the teacher before filling.  
Before removing the excess GP, have the teacher check whether the canal is sufficiently filled.  
For filling the root canals of the lower molar with  
gutta-percha: the mesial canals are filled with gutta-percha up to the canal entrances. Space is left free in the distal canal for a root post.
  12. During one of the practicals, the previously endodontically treated be bleached above the incisor with the "walking bleach" method. Apply rubber dam and remove temporary GIC and Cavit filling.  
Check whether the GP has been removed sufficiently deeply.  
Apply a thin layer (1 mm) of Cavit to the canal filling. Carbamide peroxide (Opalescence) is then applied to the pulp chamber and the endodontic opening is closed with a thin layer of Cavit.
  13. Take an X-ray of the end result (the so-called final photo) and have it checked.
  14. Have each individual tooth signed on Form 2.
  15. The test element is the Msup. The endodontic treatment is done in a natural element. The most suitable molar is selected in consultation with the teacher  
This test is the last endodontic treatment on phantom before the first clinical treatment! It is therefore the intention that this test element is treated as if it were a clinical treatment (unfortunately with the exception of the electronic length determination, but with the execution of the flushing protocol).

## Products

Endodontic treatments in described teeth. "Walking bleach on an upper central incisor.

## Debriefing

Discussion takes place during the practical on the basis of actions and/or questions.